# CAA 211(b) Alternative Tier 2 Health Effects Tests of Gasoline-Isobutanol Evaporative Emissions

**Supplemental Exhibit J**
**for Butamax's 09 June 2011 Application**
**to Register Isobutanol as a Gasoline Additive**

**Submitted by**
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**NOTE: Pages original to this submission are numbered at the bottom, centered. To maintain originality of the appended reports, pages in the appendices have not been re-numbered; only the header page for each appendix is numbered in the submission sequence. Appendices D through F are standalone reports with independent page numbers and Tables of Contents.**

## Overview of the Health Effects Tests

This supplement to Butamax's application to register isobutanol as a gasoline additive reports health effects tests required in 40 CFR 79 Registration of Fuels and Fuel Additives. The studies reported herein were conducted in accordance with the final Alternative Tier 2 health effects testing requirements for "other" oxyfuel groups (i.e., gasoline containing oxygenates other than MTBE) announced by EPA in 63 FR 67877.[1] This submission presents new studies addressing the subchronic inhalation toxicity testing requirements for nonbaseline (oxygenated) gasoline groups other than MTBE-gasoline; a previous submission addressed Alternative Tier 2 requirements for inhalation pharmacokinetic studies.

The Alternative Tier 2 requirements specify animal inhalation toxicity studies using test materials representing evaporative emissions of oxyfuels. The first chapter of this submission reports generation of the evaporative emissions test material from isobutanol-blended gasoline, which comprised the mixture of an approved base gasoline and nominally 16 vol% isobutanol. The "stripper still" method (approved by EPA in the above referenced notification) was used to evolve representative evaporative emissions from the isobutanol-blended gasoline. The evaporative emissions were captured and condensed to a vapor condensate which was packaged in pressure vessels and shipped to the toxicology laboratory. Included in this submission are certifications of the base and isobutanol-blended fuels, details of the stripper still processing, and chemical analyses of the vapor condensate test material.

The remaining material in this submission presents results of the required animal inhalation toxicology studies. For each of these studies, the vapor condensate described above was re-vaporized and mixed with air at controlled doses to form the inhalation exposure environments. For each of the studies presented, separate animal groups were exposed to four whole-body inhalation exposure doses: 0 (the air control groups), 2000 mg/m$^3$, 10,000 mg/m$^3$, and 20,000 mg/m$^3$. These doses were selected from foregoing studies by the API 211(b) Research Group for other oxyfuel groups as well as confirming results from a new range-finding study preceding the present work. The largest exposure dose of 20,000 mg/m$^3$ corresponds to 50% of the lower explosive limit for gasoline oxyfuel vapors.

Reports of three studies are provided herein: (1) a subchronic inhalation toxicity study with recovery and satellite groups for neurotoxicity, immunotoxicity, and genotoxicity assessments, (2) an embryo-fetal developmental toxicity study, and (3) a one-generation reproductive toxicity study. Test animals for all studies were Sprague Dawley rats.

[1] 63 FR 67877 Final Notification of Health Effects Testing Requirements for Baseline Gasoline and Oxygenated Nonbaseline Gasolines and Approval of an Alternative Emissions Generator.

## Gasoline-Isobutanol Evaporative Emissions Test Material

This chapter describes preparation of the test material used in the exposure phases of the health effects studies.

Properties of the Base Gasoline and Isobutanol-blended Gasoline

The base gasoline for health effects testing specified at 40 CFR 79.55 is no longer available or commercially relevant due to its high sulfur content. As agreed with EPA OTAQ staff, the present studies instead used the gasoline vehicle emissions test fuel specified at 40 CFR 86.113-04(a) (1) which has similar properties (except sulfur) and was also used in the applicant's Tier 1 health effects tests.

Appendix A presents the Certificate of Analysis for the base gasoline with comparison to the specification requirements from 40 CFR 86.113-04(a) (1). The base gasoline used in the studies conformed to the requirements.

The isobutanol-blended gasoline from which the evaporative emissions test substance was evolved consisted of the above base gasoline combined with pure isobutanol. In accordance with the registration application, the isobutanol concentrationt was to be at least 16 vol%.

Appendix B presents the Certificate of Analysis for the isobutanol-blended fuel. The certificate confirms the isobutanol-blended gasoline contained 17.84 vol% isobutanol.

Stripper Still Generation of the Evaporative Emissions Test Material

In response to a request from the API 211(b) Research Group, EPA approved the stripper still method for generating evaporative emissions used in Alternative Tier 2 animal toxicology tests (63 FR 67877). EPA's approval was based on review of API's description and results from development of an apparatus and methods at Chevron Energy Technology Company in Richmond, CA. The present studies used the apparatus and procedures documented by the API 211(b) Research Group.[2] In addition, key Chevron staff members (including the referenced authors) were available and conducted the present work.

The isobutanol-blended gasoline described in the previous section was used as feedstock to the stripper still for generating the evaporative emissions test material. Approximately 6850 gallons of isobutanol-blended gasoline were processed in nine separate runs of the stripper still. For each run, the stripper still's

[2] Henley, M., Letinski, D., Carr, J., Caro, M., Daughtrey, W., and White, R. (2014). Health assessment of gasoline and fuel oxygenate vapors: Generation and characterization of test materials. Regulatory Toxicology and Pharmacology, Vol. 70, pp. 513-517.

1000-gallon glass-lined kettle was charged with a measured quantity of feed to about 75 - 80% capacity. The liquid in the kettle was then heated to about 150 F (giving a vapor space temperature of about 130 F) and agitated continuously to generate the evaporative emissions test material as vapor. The vapors were collected and condensed through a series of chilled receivers and traps. At these process conditions, about 10% of the original kettle charge volume was recovered as vapor condensate. The charge and recovery volumes for each batch are presented in Table 1.

**Table 1: Isobutanol-blended gasoline recovered as vapor condensate from the stripper still process**

| Run Number | Charge volume of isobutanol-blended gasoline (gal) | Vapor condensate recovered (gal) | Vapor condensate recovered (vol%) |
|---|---|---|---|
| 1970 | 808 | 81 | 10.02% |
| 1972 | 753 | 75 | 9.96% |
| 1973 | 754 | 75 | 9.95% |
| 1974 | 755 | 75 | 9.94% |
| 1975 | 757 | 75 | 9.91% |
| 1976 | 759 | 76 | 10.06% |
| 1986 | 753 | 76 | 10.09% |
| 2021 | 755 | 75 | 9.94% |
| 2022 | 754 | 74 | 9.82% |

Each vapor condensate batch was sampled and analyzed by gas chromatography at Chevron using the same method employed by the API 211(b) Research Group. Across the nine batches, some 65 molecules were detected by the gas chromatographs as constituents of the vapor condensates. However, about 99% of each vapor condensate batch was comprised of the 25 most concentrated species, as summarized in Table 2 below. Complete results from the GC analyses on all nine vapor condensate batches are presented in Appendix C.

Processing this quantity of isobutanol-blended gasoline provided all the vapor condensate test material consumed in the inhalation toxicology studies with a significant excess safety volume. Test materials from seven of the batches were used in the toxicology studies; vapor condensates 1974 and 2021 were not used.

As required by the study protocols, archival samples from all batches used in the studies were collected and are in storage at the toxicology laboratory, Envigo's Princeton Research Center in East Millstone, NJ.

**Table 2: Summary of GC Analyses on Vapor Condensate Test Materials**

| | Weight% of each compound, by Run Number | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Compound** | **1970** | **1972** | **1973** | **1974** | **1975** | **1976** | **1986** | **2021** | **2022** |
| isopentane | 66.5 | 66.1 | 65.3 | 65.8 | 65.1 | 66.9 | 62.8 | 63.3 | 65.9 |
| 2,2,4-trimethyl pentane | 7.84 | 8.12 | 8.62 | 8.79 | 7.51 | 7.66 | 9.40 | 7.33 | 6.99 |
| isobutene | 6.84 | 6.14 | 6.17 | 7.29 | 9.37 | 6.76 | 6.14 | 8.93 | 9.47 |
| cyclopentane | 4.97 | 5.21 | 5.18 | 4.83 | 4.65 | 5.10 | 5.13 | 4.61 | 4.89 |
| 2,3,3-trimethyl pentane | 4.30 | 4.44 | 4.95 | 4.73 | 4.14 | 4.06 | 5.19 | 4.11 | 3.78 |
| isobutanol | 2.82 | 3.03 | 2.49 | 1.87 | 2.72 | 2.74 | 3.81 | 3.90 | 2.51 |
| 2,2-dimethyl butane | 2.23 | 2.35 | 2.36 | 2.25 | 2.11 | 2.33 | 2.32 | 2.08 | 2.23 |
| n-hexane | 0.60 | 0.64 | 0.65 | 0.63 | 0.56 | 0.62 | 0.68 | 0.56 | 0.56 |
| 2,3-dimethyl pentane | 0.58 | 0.60 | 0.62 | 0.61 | 0.54 | 0.57 | 0.68 | 0.55 | 0.50 |
| 2-methyl pentane | 0.40 | 0.43 | 0.44 | 0.42 | 0.38 | 0.42 | 0.44 | 0.38 | 0.40 |
| 3-methyl pentane | 0.37 | 0.39 | 0.39 | 0.37 | 0.34 | 0.37 | 0.40 | 0.34 | 0.36 |
| n-butane | 0.30 | 0.27 | 0.27 | 0.30 | 0.34 | 0.27 | 0.26 | 0.33 | 0.33 |
| 2,5-dimethyl hexane | 0.27 | 0.28 | 0.30 | 0.32 | 0.26 | 0.25 | 0.33 | 0.30 | 0.24 |
| 2,4-dimethyl hexane | 0.20 | 0.21 | 0.22 | 0.24 | 0.19 | 0.19 | 0.24 | 0.24 | 0.18 |
| 2,2-dimethyl propane | 0.21 | 0.20 | 0.19 | 0.21 | 0.22 | 0.19 | 0.18 | 0.21 | 0.22 |
| n-pentane | 0.20 | 0.20 | 0.20 | 0.20 | 0.19 | 0.20 | 0.19 | 0.18 | 0.19 |
| methyl cyclopentane | 0.18 | 0.20 | 0.20 | 0.18 | 0.17 | 0.19 | 0.21 | 0.17 | 0.17 |
| 2-methy hexane | 0.18 | 0.19 | 0.20 | 0.20 | 0.17 | 0.18 | 0.21 | 0.20 | 0.16 |
| 2,3,4-trimethyl pentane | 0.14 | 0.14 | 0.22 | 0.16 | 0.13 | 0.13 | 0.17 | 0.13 | 0.12 |
| 2-methyl hexane | 0.14 | 0.15 | 0.15 | 0.14 | 0.13 | 0.14 | 0.16 | 0.17 | 0.12 |
| 2,2,3-trimethyl pentane | 0.10 | 0.10 | 0.11 | 0.11 | 0.09 | 0.09 | 0.12 | 0.09 | 0.09 |
| 2,3-dimethyl butane | 0.08 | 0.08 | 0.09 | 0.08 | 0.07 | 0.08 | 0.08 | 0.07 | 0.08 |
| methyl cyclohexane | ---- | 0.02 | ---- | ---- | ---- | ---- | 0.04 | 0.44 | 0.01 |
| 1-cis-3-dimethyl cyclohexane | 0.05 | 0.05 | 0.02 | 0.04 | 0.05 | 0.04 | 0.06 | 0.08 | 0.04 |
| 1,2,4-trimethyl benzene | 0.03 | 0.04 | 0.05 | 0.06 | 0.04 | 0.03 | 0.05 | 0.04 | 0.04 |
| **TOTAL** | 99.6 | 99.6 | 99.4 | 99.8 | 99.5 | 99.5 | 99.3 | 98.8 | 99.5 |

**Health Effects Tests**

This chapter provides details of the health effects studies and guides to the attached toxicology reports. All studies followed US EPA and other appropriate Good Laboratory Practice Standards.

Subchronic Inhalation Toxicity Study

This study comprised a 90-day (13-week) subchronic inhalation toxicity study with 4-week recovery using Sprague Dawley CD® rats. Satellite animals were similarly exposed for evaluation of neuropathology, GFAP, genotoxicity, and immunotoxicity. The study found the NOAEL (no observed adverse effect level) for evaporative emissions of isobutanol-blended gasoline to be 20,000 mg/m$^3$, i.e., the study maximum exposure dose.

The complete study report appears in Appendix D. Note the study report was amended to correct a typographical error and a minor omission, both in the opening Summary of the report; the amendment is included immediately preceding the full report.

Developmental Toxicity Study

Time-mated female Sprague Dawley CD® rats were exposed to the isobutanol-gasoline evaporative emissions in a study of embryo-fetal developmental toxicity. The study found that whole-body inhalation of the isobutanol-gasoline evaporative emissions was not associated with any effects on the female rats or their fetuses. The NOEL (no observable effect level) for maternal and developmental effects was thus considered to be the study maximum dose of 20,000 mg/m$^3$.

The complete study report is attached at Appendix E.

Reproductive Toxicity Study

The final report in this submission documents a one-generation study of the potential reproductive toxicity of isobutanal-blended gasoline evaporative emissions, again using Sprague Dawley rats. Parameters for this study were duplicated from earlier studies on oxyfuels conducted by the API 211(b) Research Group. The study conclusions again indicate a NOAEL for isobutanol-gasoline evaporative emissions at the study maximum exposure concentration of 20,000 mg/m$^3$.

The report of the reproductive toxicity investigation is attached as Appendix F.

# Appendix A
# Certificate of Analysis:  Base Gasoline

GAGE PRODUCTS CO.
821 WANDA AVENUE
FERNDALE, MI 48220
(248) 541-3824

# Gage Products Company
# Certificate of Analysis / QC Results



Date: 09/16/14 at 1:09 PM

**Customer: BAB01 / Butamax Advanced Biofuels LLC**

**Customer PO # :**

**Packaged Product:** 40580
US EPA Cert Fuel 96 RON

| Property | Test Method | UOM | Specification | Value |
|---|---|---|---|---|
| SPECIFIC GRAVITY @ 60 DEG. F | ASTM D4052 | | REPORT | 0.7371 |
| API GRAVITY | ASTM D4052 | | REPORT | 60.4 |
| DISTILLATION, IBP | ASTM D86 | DEG F (DEG C) | 75.0 - 95.0(23.9 - 35.0) | 86.8(30.4) |
| DISTILLATION, 5% | ASTM D86 | DEG F (DEG C) | REPORT | 108.7(42.6) |
| DISTILLATION, 10% | ASTM D86 | DEG F (DEG C) | 120.0 - 135.0(48.9 - 57.2) | 123.1(50.6) |
| DISTILLATION, 20% | ASTM D86 | DEG F (DEG C) | REPORT | 143.4(61.9) |
| DISTILLATION, 30% | ASTM D86 | DEG F (DEG C) | REPORT | 166.7(74.8) |
| DISTILLATION, 40% | ASTM D86 | DEG F (DEG C) | REPORT | 196.4(91.3) |
| DISTILLATION, 50% | ASTM D86 | DEG F (DEG C) | 200.0 - 230.0(93.3 - 110.0) | 218.9(103.8) |
| DISTILLATION, 60% | ASTM D86 | DEG F (DEG C) | REPORT | 229.6(109.8) |
| DISTILLATION, 70% | ASTM D86 | DEG F (DEG C) | REPORT | 240.3(115.7) |
| DISTILLATION, 80% | ASTM D86 | DEG F (DEG C) | REPORT | 261.3(127.4) |
| DISTILLATION, 90% | ASTM D86 | DEG F (DEG C) | 300.0 - 325.0(148.9 - 162.8) | 317.9(158.8) |
| DISTILLATION, 95% | ASTM D86 | DEG F (DEG C) | REPORT | 337.0(169.4) |
| DISTILLATION, DRY POINT | ASTM D86 | DEG F (DEG C) | 415.0(212.8), MAX | 365.6(185.3) |
| RECOVERY | ASTM D86 | VOL.% | REPORT | 97.1 |
| RESIDUE | ASTM D86 | VOL.% | REPORT | 1.0 |
| LOSS | ASTM D86 | VOL.% | REPORT | 1.9 |
| RVP @ 100 DEG. F | ASTM D5191 | PSI (KPA) | 8.70 - 9.20(59.94 - 63.39) | 8.93(61.53) |
| RESEARCH OCTANE NUMBER | ASTM D2699 | RON | 96.0 - 98.5 | 96.8 |
| MOTOR OCTANE NUMBER | ASTM D2700 | MON | REPORT | 88.8 |
| OCTANE RATING | GAGE-CALCULATED | R+M/2 | REPORT | 92.8 |
| OCTANE SENSITIVITY | GAGE-CALCULATED | R-M | 7.5, MIN | 8.0 |
| AROMATIC CONTENT | ASTM D1319 | VOL.% | 35.0, MAX | 20.8 |
| OLEFIN CONTENT | ASTM D1319 | VOL.% | 10.0, MAX | 0.0 |
| SATURATE CONTENT | ASTM D1319 | VOL.% | REPORT | 79.2 |
| SULFUR CONTENT | ASTM D5453 | PPM | 25.0 - 35.0 | 29.2 |
| LEAD CONTENT | ASTM D3237 | G/GAL | 0.05, MAX. | 0 |
| PHOSPHOROUS CONTENT | ASTM D3231 | G/GAL | 0.005, MAX. | 0 |
| CARBON CONTENT | ASTM D5291 | WT.% | REPORT | 86.35 |
| HYDROGEN CONTENT | ASTM D5291 | WT.% | REPORT | 13.65 |
| C/H RATIO | GAGE-CALCULATED | WT/WT | REPORT | 6.328 |
| H/C RATIO | GAGE-CALCULATED | MOLE/MOLE | REPORT | 1.883 |
| NET HEAT OF COMBUSTION | ASTM D240 | BTU/LB (MJ/KG) | REPORT | 18696.6(43.6) |
| CARBON DENSITY | ASTM E191 | | 2401 - 2441 | 2405 |

**Lot #** 7024800 **Made** 07/15/14

In sealed unopened containers this product is good until 07/15/15

**Approved By:** [redacted]

# Appendix B
# Certificate of Analysis: Isobutanol-blended Gasoline

GAGE PRODUCTS CO.
821 WANDA AVENUE
FERNDALE, MI 48220
(248) 541-3824

# Gage Products Company
# Certificate of Analysis / QC Results



Date: 09/16/14 at 11:57 AM

**Customer: BAB01 / Butamax Advanced Biofuels LLC**

**Customer PO # :**

**Packaged Product:** 41498-55F
EPA Cert Fuel iB 18

| Property | Test Method | UOM | Specification | Value |
|---|---|---|---|---|
| SPECIFIC GRAVITY @ 60 DEG. F | ASTM D4052 | | REPORT | 0.7491 |
| API GRAVITY | ASTM D4052 | | REPORT | 57.4 |
| RVP @ 100 DEG. F | ASTM D5191 | PSI (KPA) | REPORT | 8.22(56.64) |
| DISTILLATION, IBP | ASTM D86 | DEG F (DEG C) | REPORT | 92.2(33.4) |
| DISTILLATION, 5% | ASTM D86 | DEG F (DEG C) | REPORT | 119.6(48.7) |
| DISTILLATION, 10% | ASTM D86 | DEG F (DEG C) | REPORT | 134.8(57.1) |
| DISTILLATION, 20% | ASTM D86 | DEG F (DEG C) | REPORT | 157.2(69.6) |
| DISTILLATION, 30% | ASTM D86 | DEG F (DEG C) | REPORT | 179.8(82.1) |
| DISTILLATION, 40% | ASTM D86 | DEG F (DEG C) | REPORT | 197.6(92.0) |
| DISTILLATION, 50% | ASTM D86 | DEG F (DEG C) | REPORT | 206.3(96.8) |
| DISTILLATION, 60% | ASTM D86 | DEG F (DEG C) | REPORT | 210.8(99.3) |
| DISTILLATION, 70% | ASTM D86 | DEG F (DEG C) | REPORT | 215.8(102.1) |
| DISTILLATION, 80% | ASTM D86 | DEG F (DEG C) | REPORT | 233.2(111.8) |
| DISTILLATION, 90% | ASTM D86 | DEG F (DEG C) | REPORT | 308.7(153.7) |
| DISTILLATION, 95% | ASTM D86 | DEG F (DEG C) | REPORT | 334.7(168.2) |
| DISTILLATION, DRY POINT | ASTM D86 | DEG F (DEG C) | REPORT | 360.6(182.6) |
| RECOVERY | ASTM D86 | VOL.% | REPORT | 97.7 |
| RESIDUE | ASTM D86 | VOL.% | REPORT | 1.1 |
| LOSS | ASTM D86 | VOL.% | REPORT | 1.2 |
| ETHANOL CONTENT | ASTM D4815 | VOL.% | 0.20, MAX | 0.00 |
| ISOBUTYL ALCOHOL CONTENT | ASTM D4815mod | VOL.% | 17.60 - 18.20 | 17.84 |
| RESEARCH OCTANE NUMBER | ASTM D2699 | RON | REPORT | 100.7 |
| MOTOR OCTANE NUMBER | ASTM D2700 | MON | REPORT | 88.2 |
| OCTANE RATING | GAGE-CALCULATED | R+M/2 | REPORT | 94.5 |
| OCTANE SENSITIVITY | GAGE-CALCULATED | R-M | REPORT | 12.5 |
| AROMATIC CONTENT | ASTM D1319 | VOL.% | REPORT | 20.4 |
| OLEFIN CONTENT | ASTM D1319 | VOL.% | REPORT | 0.1 |
| SATURATE CONTENT | ASTM D1319 | VOL.% | REPORT | 61.7 |
| BENZENE CONTENT | ASTM D5580 | VOL.% | REPORT | 0.00 |
| SULFUR CONTENT | ASTM D5453 | PPM | REPORT | 21.4 |
| LEAD CONTENT | ASTM D3237 | G/GAL | 0.05, MAX. | 0.00 |
| PHOSPHOROUS CONTENT | ASTM D3231 | G/GAL | 0.005, MAX. | 0.000 |

**Lot #** 7208400 **Made** 09/08/14

In sealed unopened containers this product is good until 09/08/15

**Approved By:** [redacted]

# Appendix C
# GC Analyses: Vapor Condensates

108_141022_002 VC-Run 1970 distillate batch 1.txt
CHEVRON RESEARCH GASOLINE ANALYSIS
ASTM DHAX METHOD

Sample ID: VC-Run 1970 distillate batch 1
Acquisition Date & Time: 10/22/2014 9:32:40 AM
Channel: C108 (Offline)
Analysis: 108_141022_002.dat

*** DETAILED COMPOSITION, PERCENT ***

| C NO. | PARA | OLEF | NAPH | AROM | UNCL HC | TOTALS BY C # | NORMAL PARA | NON-ALKYL I-PARA | ALKYL I-PARA | CYCLO-PENT | CYCLO-HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| => BY WEIGHT | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 7.14 | **** | **** | **** | 2.82 | 9.97 | 0.30 | 6.84 | **** | **** | **** |
| 5 | 66.96 | **** | 4.97 | **** | **** | 71.93 | 0.20 | 66.76 | **** | 4.97 | **** |
| 6 | 3.68 | **** | 0.22 | **** | **** | 3.90 | 0.60 | 3.07 | **** | 0.18 | 0.04 |
| 7 | 0.98 | **** | 0.01 | **** | **** | 1.00 | **** | 0.98 | **** | **** | 0.01 |
| 8 | 12.91 | **** | 0.13 | **** | **** | 13.03 | 0.03 | 0.50 | 12.37 | **** | 0.13 |
| 9 | 0.02 | **** | 0.07 | 0.09 | **** | 0.18 | 0.01 | 0.01 | **** | 0.02 | 0.05 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 91.69 | **** | 5.40 | 0.09 | 2.82 | 100.00 | 1.15 | 78.17 | 12.37 | 5.18 | 0.22 |
| => BY VOLUME | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 8.12 | **** | **** | **** | 2.29 | 10.41 | 0.33 | 7.79 | **** | **** | **** |
| 5 | 68.72 | **** | 4.25 | **** | **** | 72.97 | 0.20 | 68.52 | **** | 4.25 | **** |
| 6 | 3.58 | **** | 0.19 | **** | **** | 3.77 | 0.58 | 3.00 | **** | 0.16 | 0.03 |
| 7 | 0.91 | **** | 0.01 | **** | **** | 0.92 | **** | 0.91 | **** | **** | 0.01 |
| 8 | 11.69 | **** | 0.10 | **** | **** | 11.79 | 0.03 | 0.46 | 11.20 | **** | 0.10 |
| 9 | 0.02 | **** | 0.06 | 0.07 | **** | 0.14 | 0.01 | 0.01 | **** | 0.02 | 0.04 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 93.04 | **** | 4.60 | 0.07 | 2.29 | 100.00 | 1.15 | 80.69 | 11.20 | 4.42 | 0.18 |
| => BY MOLAR | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 9.16 | **** | **** | **** | 3.62 | 12.78 | 0.38 | 8.78 | **** | **** | **** |
| 5 | 69.19 | **** | 5.28 | **** | **** | 74.48 | 0.21 | 68.99 | **** | 5.28 | **** |
| 6 | 3.18 | **** | 0.20 | **** | **** | 3.38 | 0.52 | 2.66 | **** | 0.16 | 0.03 |
| 7 | 0.73 | **** | 0.01 | **** | **** | 0.74 | **** | 0.73 | **** | **** | 0.01 |
| 8 | 8.42 | **** | 0.08 | **** | **** | 8.51 | 0.02 | 0.33 | 8.08 | **** | 0.08 |
| 9 | 0.01 | **** | 0.04 | 0.06 | **** | 0.11 | 0.01 | 0.01 | **** | 0.01 | 0.03 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 90.71 | **** | 5.61 | 0.06 | 3.62 | 100.00 | 1.14 | 81.49 | 8.08 | 5.46 | 0.15 |

GRP. TYPE, VOL %: P = 95.22, O = 0.00, N = 4.71, A = 0.07, Saturates = 99.93
DIENE CONTENT = 0 vol ppm AVG MW= 74.6 API GR.= 89.2 SP. GR.= 0.6411
OCTANE NUMBER: (from pure values) RON = 94.0 MON = 90.9
(from blending values) RON = 92.5 MON = 88.4
CARBON-HYDROGEN RATIO = 5.041 STOICH. AIR-FUEL RATIO = 15.25 lbs air/lbs fuel
BTU/lb = 19253 NET, 20735 GROSS; BTU/gal = 103002 NET, 110929 GROSS
REID VAPOR PRESSURE = 21.7 BROMINE NO. = 0.0

* DISTILLATION CURVES

| VOL % | TBP | D86 |
|---|---|---|
| 0 | 11 | 83 |
| 5 | 11 | 83 |
| 10 | 82 | 83 |
| 15 | 82 | 83 |
| 20 | 82 | 83 |
| 25 | 82 | 83 |
| 30 | 82 | 83 |
| 35 | 82 | 83 |
| 40 | 82 | 83 |
| 45 | 82 | 83 |
| 50 | 82 | 83 |
| 55 | 82 | 83 |
| 60 | 82 | 83 |
| 65 | 82 | 83 |
| 70 | 82 | 83 |
| 75 | 82 | 83 |
| 80 | 121 | 121 |
| 85 | 181 | 181 |
| 90 | 211 | 210 |
| 95 | 211 | 238 |
| 100 | 337 | 238 |

* COMPOUND DICTIONARY NUMBERS AND AREAS AS READ IN

| CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 157883 | 4 | 6872 | 8 | 4974 | 7 | 1546917 | 6 | 4632 |
| 12 | 52022 | 800 | 118832 | 13 | 1771 | 10 | 9361 | 11 | 8555 |
| 9 | 14122 | 801 | 4383 | 18 | 854 | 20 | 1176 | 1009 | 59009 |
| 825 | 896 | 19 | 13594 | 15 | 4269 | 16 | 3166 | 37 | 184060 |
| 826 | 262 | 36 | 2298 | 31 | 6287 | 30 | 4663 | 39 | 3308 |
| 38 | 100926 | 34 | 430 | 24 | 400 | 831 | 1218 | 848 | 546 |
| 830 | 595 | 832 | 427 | 23 | 685 | 827 | 817 | 946 | 297 |
| 956 | 496 | 61 | 213 | 941 | 290 | 41 | 342 | 609 | 697 |
| 610 | 417 | 613 | 329 | 612 | 866 | | | | |

TOTAL UNCORRECTED AREA = 2324157
NUMBER OF PEAKS READ IN = 43

* DETAILED HYDROCARBON ANALYSIS, EXCLUDING COMPOUNDS BELOW 0.01 VOLUME PERCENT

NORMAL PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4 | 0.38 | 0.33 | 0.30 | N-BUTANE |
| 6 | 0.21 | 0.20 | 0.20 | N-PENTANE |
| 9 | 0.52 | 0.58 | 0.60 | N-HEXANE |
| 23 | 0.02 | 0.03 | 0.03 | N-OCTANE |
| 41 | 0.01 | 0.01 | 0.01 | N-NONANE |

ISO-PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 5 | 8.78 | 7.79 | 6.84 | ISOBUTANE | |
| 8 | 0.22 | 0.23 | 0.21 | 22-DIME PROPANE | |
| 7 | 68.77 | 68.29 | 66.54 | ISOPENTANE | |
| 12 | 1.93 | 2.18 | 2.23 | 22-DIME BUTANE | |
| 13 | 0.07 | 0.07 | 0.08 | 23-DIME BUTANE | |
| 10 | 0.35 | 0.39 | 0.40 | 2-ME PENTANE | |
| 11 | 0.32 | 0.35 | 0.37 | 3-ME PENTANE | |
| 18 | 0.03 | 0.03 | 0.04 | 22-DIME PENTANE | |
| 20 | 0.04 | 0.05 | 0.05 | 24-DIME PENTANE | |
| 19 | 0.43 | 0.53 | 0.58 | 23-DIME PENTANE | |
| 15 | 0.14 | 0.17 | 0.18 | 2-ME HEXANE | |
| 16 | 0.10 | 0.13 | 0.14 | 3-ME HEXANE | |
| 37 | 5.12 | 7.22 | 7.84 | 224-TRIME PENTANE | * |
| 36 | 0.06 | 0.09 | 0.10 | 223-TRIME PENTANE | * |
| 31 | 0.17 | 0.25 | 0.27 | 25-DIME HEXANE | |
| 30 | 0.13 | 0.18 | 0.20 | 24-DIME HEXANE | |
| 39 | 0.09 | 0.12 | 0.14 | 234-TRIME PENTANE | * |
| 38 | 2.81 | 3.77 | 4.30 | 233-TRIME PENTANE | * |
| 34 | 0.01 | 0.02 | 0.02 | 2-ME-3-ET PENTANE | |
| 24 | 0.01 | 0.02 | 0.02 | 2-ME HEPTANE | |

CYCLOPENTANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 800 | 5.28 | 4.25 | 4.97 | CYCLOPENTANE |
| 801 | 0.16 | 0.16 | 0.18 | ME CYCLOPENTANE |
| 848 | 0.01 | 0.02 | 0.02 | 113T4-TETRME CPENT |

CYCLOHEXANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 825 | 0.03 | 0.03 | 0.04 | CYCLOHEXANE |
| 831 | 0.03 | 0.04 | 0.05 | 1C3-DIME CYCHEXANE |
| 830 | 0.02 | 0.02 | 0.02 | 1T2-DIME CYCHEXANE |
| 832 | 0.01 | 0.01 | 0.02 | 1T3-DIME CYCHEXANE |
| 827 | 0.02 | 0.03 | 0.03 | ETHYL CYCLOHEXANE |
| 946 | 0.01 | 0.01 | 0.01 | 113-TRIME CYCHEXANE |
| 956 | 0.01 | 0.02 | 0.02 | 1C3T5-TRIME CYCHEX |

AROMATIC HCS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 609 | 0.02 | 0.02 | 0.03 | 1-ME-3-ET BENZENE | |
| 610 | 0.01 | 0.01 | 0.02 | 1-ME-4-ET BENZENE | |
| 612 | 0.02 | 0.03 | 0.03 | 124-TRIME BENZENE | * |

UNCLASSIFIED HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 1009 | 3.62 | 2.29 | 2.82 | ISOBUTANOL |

108_141022_006 VC-Run 1972 distillate batch 2.txt
CHEVRON RESEARCH GASOLINE ANALYSIS
ASTM DHAX METHOD

Sample ID: VC-Run 1972 distillate batch 2
Acquisition Date & Time: 10/23/2014 10:58:20 AM
Channel: C108 (Offline)
Analysis: 108_141022_006.dat

*** DETAILED COMPOSITION, PERCENT ***

| C NO. | PARA | OLEF | NAPH | AROM | UNCL HC | TOTALS BY C # | NORMAL PARA | NON-ALKYL I-PARA | ALKYL I-PARA | CYCLO-PENT | CYCLO-HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| => BY WEIGHT | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 6.41 | **** | **** | **** | 3.03 | 9.44 | 0.27 | 6.14 | **** | **** | **** |
| 5 | 66.46 | **** | 5.21 | **** | **** | 71.67 | 0.20 | 66.26 | **** | 5.21 | **** |
| 6 | 3.89 | **** | 0.24 | **** | **** | 4.13 | 0.64 | 3.25 | **** | 0.20 | 0.04 |
| 7 | 1.04 | **** | 0.02 | **** | **** | 1.06 | 0.01 | 1.03 | **** | **** | 0.02 |
| 8 | 13.35 | **** | 0.13 | **** | **** | 13.48 | 0.03 | 0.52 | 12.81 | **** | 0.13 |
| 9 | 0.03 | **** | 0.07 | 0.11 | **** | 0.21 | 0.02 | 0.01 | **** | 0.02 | 0.05 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 91.18 | **** | 5.67 | 0.11 | 3.03 | 100.00 | 1.16 | 77.22 | 12.81 | 5.43 | 0.24 |
| => BY VOLUME | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 7.31 | **** | **** | **** | 2.46 | 9.77 | 0.30 | 7.00 | **** | **** | **** |
| 5 | 68.38 | **** | 4.46 | **** | **** | 72.84 | 0.20 | 68.18 | **** | 4.46 | **** |
| 6 | 3.81 | **** | 0.20 | **** | **** | 4.01 | 0.62 | 3.19 | **** | 0.17 | 0.03 |
| 7 | 0.97 | **** | 0.02 | **** | **** | 0.98 | 0.01 | 0.96 | **** | **** | 0.02 |
| 8 | 12.12 | **** | 0.11 | **** | **** | 12.23 | 0.02 | 0.47 | 11.62 | **** | 0.11 |
| 9 | 0.02 | **** | 0.06 | 0.08 | **** | 0.17 | 0.01 | 0.01 | **** | 0.02 | 0.04 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 92.61 | **** | 4.85 | 0.08 | 2.46 | 100.00 | 1.17 | 79.82 | 11.62 | 4.65 | 0.20 |
| => BY MOLAR | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 8.25 | **** | **** | **** | 3.90 | 12.16 | 0.35 | 7.90 | **** | **** | **** |
| 5 | 68.93 | **** | 5.56 | **** | **** | 74.49 | 0.20 | 68.73 | **** | 5.56 | **** |
| 6 | 3.38 | **** | 0.21 | **** | **** | 3.59 | 0.56 | 2.83 | **** | 0.18 | 0.04 |
| 7 | 0.78 | **** | 0.02 | **** | **** | 0.80 | 0.01 | 0.77 | **** | **** | 0.02 |
| 8 | 8.75 | **** | 0.09 | **** | **** | 8.84 | 0.02 | 0.34 | 8.39 | **** | 0.09 |
| 9 | 0.02 | **** | 0.04 | 0.07 | **** | 0.13 | 0.01 | 0.01 | **** | 0.01 | 0.03 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 90.11 | **** | 5.92 | 0.07 | 3.90 | 100.00 | 1.15 | 80.58 | 8.39 | 5.75 | 0.17 |

GRP. TYPE, VOL %: P = 94.94, O = 0.00, N = 4.97, A = 0.09, Saturates = 99.91
DIENE CONTENT = 0 vol ppm AVG MW= 74.8 API GR.= 88.7 SP. GR.= 0.6427
OCTANE NUMBER: (from pure values) RON = 93.9 MON = 90.8
(from blending values) RON = 92.4 MON = 88.3
CARBON-HYDROGEN RATIO = 5.047 STOICH. AIR-FUEL RATIO = 15.25 lbs air/lbs fuel
BTU/lb = 19244 NET, 20721 GROSS; BTU/gal = 103214 NET, 111134 GROSS
REID VAPOR PRESSURE = 21.1 BROMINE NO. = 0.0

* DISTILLATION CURVES

| VOL % | TBP | D86 |
|---|---|---|
| 0 | 11 | 83 |
| 5 | 11 | 83 |
| 10 | 82 | 83 |
| 15 | 82 | 83 |
| 20 | 82 | 83 |
| 25 | 82 | 83 |
| 30 | 82 | 83 |
| 35 | 82 | 83 |
| 40 | 82 | 83 |
| 45 | 82 | 83 |
| 50 | 82 | 83 |
| 55 | 82 | 83 |
| 60 | 82 | 83 |
| 65 | 82 | 83 |
| 70 | 82 | 83 |
| 75 | 82 | 121 |
| 80 | 121 | 122 |
| 85 | 181 | 181 |
| 90 | 211 | 210 |
| 95 | 211 | 238 |
| 100 | 337 | 238 |

* COMPOUND DICTIONARY NUMBERS AND AREAS AS READ IN

| CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 130396 | 4 | 5810 | 8 | 4200 | 7 | 1414759 | 6 | 4207 |
| 12 | 50546 | 800 | 114700 | 13 | 1805 | 10 | 9195 | 11 | 8453 |
| 9 | 13760 | 801 | 4346 | 18 | 936 | 20 | 1124 | 1009 | 58347 |
| 825 | 918 | 19 | 12986 | 15 | 4080 | 16 | 3176 | 37 | 175723 |
| 14 | 202 | 826 | 474 | 36 | 2155 | 31 | 5955 | 30 | 4460 |
| 39 | 3035 | 38 | 96086 | 34 | 438 | 24 | 358 | 831 | 1086 |
| 848 | 512 | 830 | 519 | 832 | 417 | 23 | 584 | 827 | 912 |
| 946 | 290 | 956 | 488 | 61 | 209 | 941 | 268 | 41 | 360 |
| 609 | 765 | 610 | 389 | 613 | 372 | 608 | 177 | 612 | 913 |

TOTAL UNCORRECTED AREA = 2140891
NUMBER OF PEAKS READ IN = 45

* DETAILED HYDROCARBON ANALYSIS, EXCLUDING COMPOUNDS BELOW 0.01 VOLUME PERCENT

NORMAL PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4 | 0.35 | 0.30 | 0.27 | N-BUTANE |
| 6 | 0.20 | 0.20 | 0.20 | N-PENTANE |
| 9 | 0.56 | 0.62 | 0.64 | N-HEXANE |
| 23 | 0.02 | 0.02 | 0.03 | N-OCTANE |
| 41 | 0.01 | 0.01 | 0.02 | N-NONANE |

ISO-PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 5 | 7.90 | 7.00 | 6.14 | ISOBUTANE | |
| 8 | 0.20 | 0.21 | 0.20 | 22-DIME PROPANE | |
| 7 | 68.53 | 67.97 | 66.07 | ISOPENTANE | |
| 12 | 2.04 | 2.31 | 2.35 | 22-DIME BUTANE | |
| 13 | 0.07 | 0.08 | 0.08 | 23-DIME BUTANE | |
| 10 | 0.37 | 0.42 | 0.43 | 2-ME PENTANE | |
| 11 | 0.34 | 0.38 | 0.39 | 3-ME PENTANE | |
| 18 | 0.03 | 0.04 | 0.04 | 22-DIME PENTANE | |
| 20 | 0.04 | 0.05 | 0.05 | 24-DIME PENTANE | |
| 19 | 0.45 | 0.55 | 0.60 | 23-DIME PENTANE | |
| 15 | 0.14 | 0.18 | 0.19 | 2-ME HEXANE | |
| 16 | 0.11 | 0.14 | 0.15 | 3-ME HEXANE | |
| 37 | 5.32 | 7.50 | 8.12 | 224-TRIME PENTANE | * |
| 36 | 0.07 | 0.09 | 0.10 | 223-TRIME PENTANE | * |
| 31 | 0.18 | 0.25 | 0.28 | 25-DIME HEXANE | |
| 30 | 0.14 | 0.19 | 0.21 | 24-DIME HEXANE | |
| 39 | 0.09 | 0.12 | 0.14 | 234-TRIME PENTANE | * |
| 38 | 2.91 | 3.91 | 4.44 | 233-TRIME PENTANE | * |
| 34 | 0.01 | 0.02 | 0.02 | 2-ME-3-ET PENTANE | |
| 24 | 0.01 | 0.02 | 0.02 | 2-ME HEPTANE | |

CYCLOPENTANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 800 | 5.56 | 4.46 | 5.21 | CYCLOPENTANE |
| 801 | 0.18 | 0.17 | 0.20 | ME CYCLOPENTANE |
| 848 | 0.01 | 0.02 | 0.02 | 113T4-TETRME CPENT |

CYCLOHEXANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 825 | 0.04 | 0.03 | 0.04 | CYCLOHEXANE |
| 826 | 0.02 | 0.02 | 0.02 | ME CYCLOHEXANE |
| 831 | 0.03 | 0.04 | 0.05 | 1C3-DIME CYCHEXANE |
| 830 | 0.02 | 0.02 | 0.02 | 1T2-DIME CYCHEXANE |
| 832 | 0.01 | 0.02 | 0.02 | 1T3-DIME CYCHEXANE |
| 827 | 0.03 | 0.03 | 0.04 | ETHYL CYCLOHEXANE |
| 946 | 0.01 | 0.01 | 0.01 | 113-TRIME CYCHEXANE |
| 956 | 0.01 | 0.02 | 0.02 | 1C3T5-TRIME CYCHEX |

AROMATIC HCS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 609 | 0.02 | 0.02 | 0.03 | 1-ME-3-ET BENZENE | |
| 610 | 0.01 | 0.01 | 0.02 | 1-ME-4-ET BENZENE | |
| 613 | 0.01 | 0.01 | 0.02 | 135-TRIME BENZENE | |
| 612 | 0.02 | 0.03 | 0.04 | 124-TRIME BENZENE | * |

UNCLASSIFIED HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 1009 | 3.90 | 2.46 | 3.03 | ISOBUTANOL |

108_141022_007 VC-Run 1973 distillate batch 3.txt
CHEVRON RESEARCH GASOLINE ANALYSIS
ASTM DHAX METHOD

Sample ID: VC-Run 1973 distillate batch 3
Acquisition Date & Time: 10/23/2014 2:43:21 PM
Channel: C108 (Offline)
Analysis: 108_141022_007.dat

*** DETAILED COMPOSITION, PERCENT ***

| C NO. | PARA | OLEF | NAPH | AROM | UNCL HC | TOTALS BY C # | NORMAL PARA | NON-ALKYL I-PARA | ALKYL I-PARA | CYCLO-PENT | CYCLO-HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| => BY WEIGHT | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 6.44 | **** | **** | **** | 2.49 | 8.93 | 0.27 | 6.17 | **** | **** | **** |
| 5 | 65.71 | **** | 5.18 | **** | **** | 70.89 | 0.20 | 65.51 | **** | 5.18 | **** |
| 6 | 3.92 | **** | 0.25 | **** | **** | 4.17 | 0.65 | 3.28 | **** | 0.20 | 0.05 |
| 7 | 1.07 | **** | **** | **** | **** | 1.07 | **** | 1.07 | **** | **** | **** |
| 8 | 14.50 | 0.05 | 0.11 | **** | **** | 14.66 | 0.03 | 0.59 | 13.89 | **** | 0.11 |
| 9 | 0.02 | **** | 0.04 | 0.12 | 0.04 | 0.23 | 0.02 | **** | **** | **** | 0.04 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.05 | 0.05 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | 0.02 | 0.02 | **** | **** | **** | **** | **** |
| TOT | 91.66 | 0.05 | 5.57 | 0.12 | 2.60 | 100.00 | 1.16 | 76.61 | 13.89 | 5.38 | 0.19 |
| => BY VOLUME | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 7.34 | **** | **** | **** | 2.02 | 9.36 | 0.29 | 7.05 | **** | **** | **** |
| 5 | 67.64 | **** | 4.44 | **** | **** | 72.08 | 0.20 | 67.44 | **** | 4.44 | **** |
| 6 | 3.84 | **** | 0.21 | **** | **** | 4.05 | 0.63 | 3.21 | **** | 0.17 | 0.04 |
| 7 | 0.99 | **** | **** | **** | **** | 0.99 | **** | 0.99 | **** | **** | **** |
| 8 | 13.17 | 0.04 | 0.09 | **** | **** | 13.29 | 0.03 | 0.54 | 12.60 | **** | 0.09 |
| 9 | 0.02 | **** | 0.03 | 0.09 | 0.04 | 0.18 | 0.02 | **** | **** | **** | 0.03 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.04 | 0.04 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** | **** |
| TOT | 92.98 | 0.04 | 4.77 | 0.09 | 2.11 | 100.00 | 1.16 | 79.22 | 12.60 | 4.61 | 0.16 |
| => BY MOLAR | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 8.34 | **** | **** | **** | 3.22 | 11.56 | 0.34 | 8.00 | **** | **** | **** |
| 5 | 68.58 | **** | 5.56 | **** | **** | 74.15 | 0.21 | 68.38 | **** | 5.56 | **** |
| 6 | 3.43 | **** | 0.22 | **** | **** | 3.65 | 0.56 | 2.86 | **** | 0.18 | 0.04 |
| 7 | 0.80 | **** | **** | **** | **** | 0.80 | **** | 0.80 | **** | **** | **** |
| 8 | 9.56 | 0.03 | 0.07 | **** | **** | 9.66 | 0.02 | 0.39 | 9.16 | **** | 0.07 |
| 9 | 0.01 | **** | 0.02 | 0.08 | 0.02 | 0.14 | 0.01 | **** | **** | **** | 0.02 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.02 | 0.02 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** | **** |
| TOT | 90.73 | 0.03 | 5.88 | 0.08 | 3.28 | 100.00 | 1.14 | 80.43 | 9.16 | 5.74 | 0.14 |

GRP. TYPE, VOL %: P = 94.99, O = 0.04, N = 4.87, A = 0.09, Saturates = 99.86
DIENE CONTENT = 0 vol ppm AVG MW= 75.3 API GR.= 88.6 SP. GR.= 0.6430
OCTANE NUMBER: (from pure values) RON = 93.8 MON = 90.8
(from blending values) RON = 92.3 MON = 88.2
CARBON-HYDROGEN RATIO = 5.053 STOICH. AIR-FUEL RATIO = 15.25 lbs air/lbs fuel
BTU/lb = 19241 NET, 20711 GROSS; BTU/gal = 103244 NET, 111130 GROSS
REID VAPOR PRESSURE = 21.0 BROMINE NO. = 0.1

* DISTILLATION CURVES

| VOL % | TBP | D86 |
|---|---|---|
| 0 | 11 | 83 |
| 5 | 11 | 83 |
| 10 | 82 | 83 |
| 15 | 82 | 83 |
| 20 | 82 | 83 |
| 25 | 82 | 83 |
| 30 | 82 | 83 |
| 35 | 82 | 83 |
| 40 | 82 | 83 |
| 45 | 82 | 83 |
| 50 | 82 | 83 |
| 55 | 82 | 83 |
| 60 | 82 | 83 |
| 65 | 82 | 83 |
| 70 | 82 | 83 |
| 75 | 121 | 121 |
| 80 | 122 | 122 |
| 85 | 181 | 194 |
| 90 | 211 | 210 |
| 95 | 230 | 238 |
| 100 | 390 | 238 |

* COMPOUND DICTIONARY NUMBERS AND AREAS AS READ IN

| CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 97641 | 4 | 4205 | 8 | 2995 | 7 | 1041310 | 6 | 3133 |
| 12 | 37798 | 800 | 84961 | 13 | 1366 | 10 | 7021 | 11 | 6291 |
| 9 | 10339 | 801 | 3312 | 18 | 669 | 20 | 881 | 1009 | 35632 |
| 825 | 781 | 19 | 10030 | 15 | 3182 | 16 | 2349 | 37 | 138725 |
| 36 | 1727 | 31 | 4825 | 30 | 3565 | 39 | 3541 | 38 | 79637 |
| 4527 | 786 | 34 | 252 | 26 | 815 | 831 | 346 | 830 | 406 |
| 832 | 400 | 23 | 461 | 827 | 572 | 946 | 250 | 189 | 685 |
| 956 | 386 | 41 | 333 | 609 | 626 | 610 | 364 | 613 | 359 |
| 612 | 794 | 191 | 828 | 4104 | 273 | | | | |

TOTAL UNCORRECTED AREA = 1594852
NUMBER OF PEAKS READ IN = 43

* DETAILED HYDROCARBON ANALYSIS, EXCLUDING COMPOUNDS BELOW 0.01 VOLUME PERCENT

NORMAL PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4 | 0.34 | 0.29 | 0.27 | N-BUTANE |
| 6 | 0.21 | 0.20 | 0.20 | N-PENTANE |
| 9 | 0.56 | 0.63 | 0.65 | N-HEXANE |
| 23 | 0.02 | 0.03 | 0.03 | N-OCTANE |
| 41 | 0.01 | 0.02 | 0.02 | N-NONANE |

ISO-PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 5 | 8.00 | 7.05 | 6.17 | ISOBUTANE | |
| 8 | 0.20 | 0.20 | 0.19 | 22-DIME PROPANE | |
| 7 | 68.18 | 67.23 | 65.32 | ISOPENTANE | |
| 12 | 2.06 | 2.32 | 2.36 | 22-DIME BUTANE | |
| 13 | 0.07 | 0.08 | 0.09 | 23-DIME BUTANE | |
| 10 | 0.38 | 0.43 | 0.44 | 2-ME PENTANE | |
| 11 | 0.34 | 0.38 | 0.39 | 3-ME PENTANE | |
| 18 | 0.03 | 0.04 | 0.04 | 22-DIME PENTANE | |
| 20 | 0.04 | 0.05 | 0.05 | 24-DIME PENTANE | |
| 19 | 0.47 | 0.57 | 0.62 | 23-DIME PENTANE | |
| 15 | 0.15 | 0.19 | 0.20 | 2-ME HEXANE | |
| 16 | 0.11 | 0.14 | 0.15 | 3-ME HEXANE | |
| 37 | 5.68 | 7.96 | 8.62 | 224-TRIME PENTANE | * |
| 36 | 0.07 | 0.10 | 0.11 | 223-TRIME PENTANE | * |
| 31 | 0.20 | 0.28 | 0.30 | 25-DIME HEXANE | |
| 30 | 0.15 | 0.20 | 0.22 | 24-DIME HEXANE | |
| 39 | 0.14 | 0.20 | 0.22 | 234-TRIME PENTANE | * |
| 38 | 3.26 | 4.35 | 4.95 | 233-TRIME PENTANE | * |
| 34 | 0.01 | 0.01 | 0.02 | 2-ME-3-ET PENTANE | |
| 26 | 0.03 | 0.05 | 0.05 | 4-ME HEPTANE | |

CYCLOPENTANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 800 | 5.56 | 4.44 | 5.18 | CYCLOPENTANE |
| 801 | 0.18 | 0.17 | 0.20 | ME CYCLOPENTANE |

CYCLOHEXANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 825 | 0.04 | 0.04 | 0.05 | CYCLOHEXANE |
| 831 | 0.01 | 0.02 | 0.02 | 1C3-DIME CYCHEXANE |
| 830 | 0.02 | 0.02 | 0.02 | 1T2-DIME CYCHEXANE |
| 832 | 0.02 | 0.02 | 0.02 | 1T3-DIME CYCHEXANE |
| 827 | 0.02 | 0.03 | 0.03 | ETHYL CYCLOHEXANE |
| 946 | 0.01 | 0.01 | 0.02 | 113-TRIME CYCHEXANE |
| 956 | 0.01 | 0.02 | 0.02 | 1C3T5-TRIME CYCHEX |

OLEFINS, DIENES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4527 | 0.03 | 0.04 | 0.05 | OCTENE C |

AROMATIC HCS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 609 | 0.02 | 0.03 | 0.04 | 1-ME-3-ET BENZENE | |
| 610 | 0.01 | 0.02 | 0.02 | 1-ME-4-ET BENZENE | |
| 613 | 0.01 | 0.02 | 0.02 | 135-TRIME BENZENE | |
| 612 | 0.03 | 0.03 | 0.05 | 124-TRIME BENZENE | * |

UNCLASSIFIED HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 1009 | 3.22 | 2.02 | 2.49 | ISOBUTANOL |
| 189 | 0.02 | 0.04 | 0.04 | UNCLASS. H.C. C- 9 |

| | | | | |
|---|---|---|---|---|
| 191 | 0.02 | 0.04 | 0.05 | UNCLASS. H.C. C-11 |
| 4104 | 0.01 | 0.01 | 0.02 | UNCLASSIFIED C-12 E |

CHEVRON RESEARCH GASOLINE ANALYSIS
ASTM DHAX METHOD

Sample ID: Run 1974 VC #4
Acquisition Date & Time: 10/29/2014 1:41:36 PM
Channel: C108 (Offline)
Analysis: 108_141029_002a.dat

*** DETAILED COMPOSITION, PERCENT ***

| C NO. | PARA | OLEF | NAPH | AROM | UNCL HC | TOTALS BY C # | NORMAL PARA | NON-ALKYL I-PARA | ALKYL I-PARA | CYCLO-PENT | CYCLO-HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| => BY WEIGHT | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 7.58 | **** | **** | **** | 1.87 | 9.45 | 0.30 | 7.29 | **** | **** | **** |
| 5 | 66.16 | **** | 4.83 | **** | **** | 70.99 | 0.20 | 65.96 | **** | 4.83 | **** |
| 6 | 3.74 | **** | 0.22 | **** | **** | 3.96 | 0.63 | 3.11 | **** | 0.18 | 0.04 |
| 7 | 1.04 | **** | **** | **** | **** | 1.04 | **** | 1.04 | **** | **** | **** |
| 8 | 14.34 | **** | 0.07 | **** | **** | 14.41 | **** | 0.56 | 13.78 | **** | 0.07 |
| 9 | **** | **** | 0.02 | 0.09 | 0.03 | 0.15 | **** | **** | **** | **** | 0.02 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 92.86 | **** | 5.14 | 0.09 | 1.90 | 100.00 | 1.13 | 77.95 | 13.78 | 5.01 | 0.13 |
| => BY VOLUME | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 8.61 | **** | **** | **** | 1.51 | 10.12 | 0.33 | 8.28 | **** | **** | **** |
| 5 | 67.82 | **** | 4.12 | **** | **** | 71.95 | 0.20 | 67.62 | **** | 4.12 | **** |
| 6 | 3.64 | **** | 0.18 | **** | **** | 3.83 | 0.61 | 3.03 | **** | 0.15 | 0.03 |
| 7 | 0.96 | **** | **** | **** | **** | 0.96 | **** | 0.96 | **** | **** | **** |
| 8 | 12.98 | **** | 0.06 | **** | **** | 13.03 | **** | 0.51 | 12.47 | **** | 0.06 |
| 9 | **** | **** | 0.02 | 0.07 | 0.02 | 0.11 | **** | **** | **** | **** | 0.02 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 94.01 | **** | 4.38 | 0.07 | 1.54 | 100.00 | 1.14 | 80.41 | 12.47 | 4.28 | 0.11 |
| => BY MOLAR | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 9.79 | **** | **** | **** | 2.41 | 12.21 | 0.39 | 9.41 | **** | **** | **** |
| 5 | 68.83 | **** | 5.17 | **** | **** | 74.00 | 0.20 | 68.62 | **** | 5.17 | **** |
| 6 | 3.26 | **** | 0.20 | **** | **** | 3.45 | 0.55 | 2.71 | **** | 0.16 | 0.04 |
| 7 | 0.78 | **** | **** | **** | **** | 0.78 | **** | 0.78 | **** | **** | **** |
| 8 | 9.42 | **** | 0.05 | **** | **** | 9.47 | **** | 0.37 | 9.06 | **** | 0.05 |
| 9 | **** | **** | 0.01 | 0.06 | 0.02 | 0.09 | **** | **** | **** | **** | 0.01 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 92.08 | **** | 5.43 | 0.06 | 2.43 | 100.00 | 1.14 | 81.88 | 9.06 | 5.33 | 0.10 |

GRP. TYPE, VOL %: P = 95.48, O = 0.00, N = 4.45, A = 0.07, Saturates = 99.93
DIENE CONTENT = 0 vol ppm AVG MW= 75.1 API GR.= 89.5 SP. GR.= 0.6403
OCTANE NUMBER: (from pure values) RON = 94.0 MON = 91.0
(from blending values) RON = 92.5 MON = 88.5
CARBON-HYDROGEN RATIO = 5.045 STOICH. AIR-FUEL RATIO = 15.25 lbs air/lbs fuel
BTU/lb = 19256 NET, 20729 GROSS; BTU/gal = 102892 NET, 110767 GROSS
REID VAPOR PRESSURE = 22.1 BROMINE NO. = 0.0

* DISTILLATION CURVES

| VOL % | TBP | D86 |
|---|---|---|
| 0 | 11 | 83 |
| 5 | 11 | 83 |
| 10 | 82 | 83 |
| 15 | 82 | 83 |
| 20 | 82 | 83 |
| 25 | 82 | 83 |
| 30 | 82 | 83 |
| 35 | 82 | 83 |
| 40 | 82 | 83 |
| 45 | 82 | 83 |
| 50 | 82 | 83 |
| 55 | 82 | 83 |
| 60 | 82 | 83 |
| 65 | 82 | 83 |
| 70 | 82 | 83 |
| 75 | 82 | 83 |
| 80 | 121 | 122 |
| 85 | 181 | 194 |
| 90 | 211 | 210 |
| 95 | 228 | 238 |
| 100 | 337 | 238 |

* COMPOUND DICTIONARY NUMBERS AND AREAS AS READ IN

| CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 57779 | 4 | 2369 | 8 | 1671 | 7 | 525554 | 6 | 1571 |
| 12 | 18054 | 800 | 39729 | 13 | 609 | 10 | 3361 | 11 | 2939 |
| 9 | 5075 | 801 | 1475 | 18 | 323 | 20 | 388 | 1009 | 13430 |
| 825 | 324 | 19 | 4880 | 15 | 1604 | 16 | 1164 | 37 | 70933 |
| 36 | 906 | 31 | 2602 | 30 | 1898 | 39 | 1301 | 38 | 38151 |
| 831 | 351 | 830 | 207 | 189 | 232 | 956 | 201 | 609 | 335 |
| 612 | 477 | | | | | | | | |

TOTAL UNCORRECTED AREA = 799893
NUMBER OF PEAKS READ IN = 31

* DETAILED HYDROCARBON ANALYSIS, EXCLUDING COMPOUNDS BELOW 0.01 VOLUME PERCENT

NORMAL PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4 | 0.39 | 0.33 | 0.30 | N-BUTANE |
| 6 | 0.20 | 0.20 | 0.20 | N-PENTANE |
| 9 | 0.55 | 0.61 | 0.63 | N-HEXANE |

ISO-PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 5 | 9.41 | 8.28 | 7.29 | ISOBUTANE |
| 8 | 0.22 | 0.22 | 0.21 | 22-DIME PROPANE |
| 7 | 68.41 | 67.40 | 65.75 | ISOPENTANE |
| 12 | 1.96 | 2.20 | 2.25 | 22-DIME BUTANE |

| | | | | |
|---|---|---|---|---|
| 13 | 0.07 | 0.07 | 0.08 | 23-DIME BUTANE |
| 10 | 0.36 | 0.41 | 0.42 | 2-ME PENTANE |
| 11 | 0.32 | 0.35 | 0.37 | 3-ME PENTANE |
| 18 | 0.03 | 0.04 | 0.04 | 22-DIME PENTANE |
| 20 | 0.04 | 0.05 | 0.05 | 24-DIME PENTANE |
| 19 | 0.45 | 0.55 | 0.61 | 23-DIME PENTANE |
| 15 | 0.15 | 0.19 | 0.20 | 2-ME HEXANE |
| 16 | 0.11 | 0.13 | 0.14 | 3-ME HEXANE |
| 37 | 5.77 | 8.08 | 8.79 | 224-TRIME PENTANE * |
| 36 | 0.07 | 0.10 | 0.11 | 223-TRIME PENTANE * |
| 31 | 0.21 | 0.30 | 0.32 | 25-DIME HEXANE |
| 30 | 0.15 | 0.21 | 0.24 | 24-DIME HEXANE |
| 39 | 0.11 | 0.14 | 0.16 | 234-TRIME PENTANE * |
| 38 | 3.11 | 4.14 | 4.73 | 233-TRIME PENTANE * |

CYCLOPENTANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 800 | 5.17 | 4.12 | 4.83 | CYCLOPENTANE |
| 801 | 0.16 | 0.15 | 0.18 | ME CYCLOPENTANE |

CYCLOHEXANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 825 | 0.04 | 0.03 | 0.04 | CYCLOHEXANE |
| 831 | 0.03 | 0.04 | 0.04 | 1C3-DIME CYCHEXANE |
| 830 | 0.02 | 0.02 | 0.03 | 1T2-DIME CYCHEXANE |
| 956 | 0.01 | 0.02 | 0.02 | 1C3T5-TRIME CYCHEX |

AROMATIC HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 609 | 0.02 | 0.03 | 0.04 | 1-ME-3-ET BENZENE |
| 612 | 0.03 | 0.04 | 0.06 | 124-TRIME BENZENE * |

UNCLASSIFIED HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 1009 | 2.41 | 1.51 | 1.87 | ISOBUTANOL |
| 189 | 0.02 | 0.02 | 0.03 | UNCLASS. H.C. C- 9 |

CHEVRON RESEARCH GASOLINE ANALYSIS
ASTM DHAX METHOD

Sample ID: Run 1975 VC #5
Acquisition Date & Time: 11/3/2014 10:25:01 AM
Channel: C108 (Offline)
Analysis: 108_141103_001.dat

*** DETAILED COMPOSITION, PERCENT ***

| C NO. | PARA | OLEF | NAPH | AROM | UNCL HC | TOTALS BY C # | NORMAL PARA | NON-ALKYL I-PARA | ALKYL I-PARA | CYCLO-PENT | CYCLO-HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| => BY WEIGHT | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 9.72 | **** | **** | **** | 2.72 | 12.44 | 0.34 | 9.37 | **** | **** | **** |
| 5 | 65.51 | **** | 4.65 | **** | **** | 70.16 | 0.19 | 65.32 | **** | 4.65 | **** |
| 6 | 3.46 | **** | 0.21 | **** | **** | 3.66 | 0.56 | 2.90 | **** | 0.17 | 0.04 |
| 7 | 0.91 | **** | 0.01 | **** | **** | 0.92 | **** | 0.91 | **** | **** | 0.01 |
| 8 | 12.38 | **** | 0.08 | **** | 0.02 | 12.47 | **** | 0.49 | 11.89 | 0.01 | 0.07 |
| 9 | 0.09 | **** | 0.05 | 0.14 | 0.05 | 0.33 | 0.02 | 0.07 | **** | 0.02 | 0.03 |
| 10 | 0.01 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 92.06 | **** | 5.00 | 0.14 | 2.80 | 100.00 | 1.11 | 79.07 | 11.89 | 4.84 | 0.15 |
| => BY VOLUME | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 11.00 | **** | **** | **** | 2.20 | 13.20 | 0.37 | 10.63 | **** | **** | **** |
| 5 | 66.95 | **** | 3.96 | **** | **** | 70.90 | 0.19 | 66.76 | **** | 3.96 | **** |
| 6 | 3.36 | **** | 0.17 | **** | **** | 3.53 | 0.54 | 2.82 | **** | 0.14 | 0.03 |
| 7 | 0.84 | **** | 0.01 | **** | **** | 0.85 | **** | 0.84 | **** | **** | 0.01 |
| 8 | 11.16 | **** | 0.07 | **** | 0.02 | 11.24 | **** | 0.45 | 10.71 | 0.00 | 0.06 |
| 9 | 0.08 | **** | 0.04 | 0.10 | 0.04 | 0.27 | 0.02 | 0.07 | **** | 0.02 | 0.03 |
| 10 | 0.01 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.00 | 0.00 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 93.39 | **** | 4.25 | 0.10 | 2.26 | 100.00 | 1.12 | 81.56 | 10.71 | 4.12 | 0.13 |
| => BY MOLAR | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 12.36 | **** | **** | **** | 3.47 | 15.83 | 0.43 | 11.93 | **** | **** | **** |
| 5 | 67.15 | **** | 4.90 | **** | **** | 72.06 | 0.19 | 66.96 | **** | 4.90 | **** |
| 6 | 2.97 | **** | 0.18 | **** | **** | 3.15 | 0.48 | 2.49 | **** | 0.15 | 0.03 |
| 7 | 0.67 | **** | 0.01 | **** | **** | 0.68 | **** | 0.67 | **** | **** | 0.01 |
| 8 | 8.01 | **** | 0.05 | **** | 0.01 | 8.08 | **** | 0.32 | 7.70 | 0.00 | 0.05 |
| 9 | 0.05 | **** | 0.03 | 0.09 | 0.03 | 0.20 | 0.01 | 0.04 | **** | 0.01 | 0.02 |
| 10 | 0.00 | **** | **** | **** | **** | 0.00 | 0.00 | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.00 | 0.00 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 91.23 | **** | 5.18 | 0.09 | 3.51 | 100.00 | 1.12 | 82.41 | 7.70 | 5.07 | 0.11 |

GRP. TYPE, VOL %: P = 95.55, O = 0.00, N = 4.34, A = 0.10, Saturates = 99.90
DIENE CONTENT = 0 vol ppm AVG MW= 74.0 API GR.= 90.2 SP. GR.= 0.6384
OCTANE NUMBER: (from pure values) RON = 94.1 MON = 91.0
(from blending values) RON = 92.8 MON = 88.6
CARBON-HYDROGEN RATIO = 5.032 STOICH. AIR-FUEL RATIO = 15.26 lbs air/lbs fuel
BTU/lb = 19252 NET, 20739 GROSS; BTU/gal = 102559 NET, 110481 GROSS
REID VAPOR PRESSURE = 23.5 BROMINE NO. = 0.0

* DISTILLATION CURVES

| VOL % | TBP | D86 |
|---|---|---|
| 0 | 11 | 83 |
| 5 | 11 | 83 |
| 10 | 11 | 83 |
| 15 | 82 | 83 |
| 20 | 82 | 83 |
| 25 | 82 | 83 |
| 30 | 82 | 83 |
| 35 | 82 | 83 |
| 40 | 82 | 83 |
| 45 | 82 | 83 |
| 50 | 82 | 83 |
| 55 | 82 | 83 |
| 60 | 82 | 83 |
| 65 | 82 | 83 |
| 70 | 82 | 83 |
| 75 | 82 | 83 |
| 80 | 121 | 121 |
| 85 | 156 | 181 |
| 90 | 211 | 210 |
| 95 | 211 | 238 |
| 100 | 365 | 238 |

* COMPOUND DICTIONARY NUMBERS AND AREAS AS READ IN

| CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 369538 | 4 | 13411 | 8 | 8886 | 7 | 2585797 | 6 | 7509 |
| 12 | 84175 | 800 | 189998 | 13 | 2858 | 10 | 15048 | 11 | 13638 |
| 9 | 22265 | 801 | 6972 | 18 | 1203 | 20 | 1789 | 1009 | 97292 |
| 825 | 1475 | 19 | 21625 | 15 | 6706 | 16 | 5086 | 37 | 301507 |
| 826 | 393 | 36 | 3789 | 31 | 10485 | 30 | 7623 | 39 | 5398 |
| 38 | 166228 | 34 | 599 | 24 | 553 | 831 | 1840 | 848 | 751 |
| 25 | 450 | 861 | 218 | 830 | 888 | 188 | 732 | 189 | 1113 |
| 829 | 320 | 52 | 1486 | 189 | 963 | 53 | 555 | 956 | 897 |
| 60 | 331 | 61 | 592 | 941 | 508 | 41 | 703 | 644 | 463 |
| 609 | 1663 | 610 | 798 | 613 | 737 | 608 | 468 | 612 | 1808 |
| 100 | 334 | 191 | 206 | | | | | | |

TOTAL UNCORRECTED AREA = 3970670
NUMBER OF PEAKS READ IN = 52

* DETAILED HYDROCARBON ANALYSIS, EXCLUDING COMPOUNDS BELOW 0.01 VOLUME PERCENT

NORMAL PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4 | 0.43 | 0.37 | 0.34 | N-BUTANE |
| 6 | 0.19 | 0.19 | 0.19 | N-PENTANE |
| 9 | 0.48 | 0.54 | 0.56 | N-HEXANE |
| 41 | 0.01 | 0.02 | 0.02 | N-NONANE |

ISO-PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 5 | 11.93 | 10.63 | 9.37 | ISOBUTANE | |
| 8 | 0.23 | 0.24 | 0.22 | 22-DIME PROPANE | |
| 7 | 66.73 | 66.52 | 65.09 | ISOPENTANE | |
| 12 | 1.81 | 2.06 | 2.11 | 22-DIME BUTANE | |
| 13 | 0.06 | 0.07 | 0.07 | 23-DIME BUTANE | |
| 10 | 0.32 | 0.37 | 0.38 | 2-ME PENTANE | |
| 11 | 0.29 | 0.33 | 0.34 | 3-ME PENTANE | |
| 18 | 0.02 | 0.03 | 0.03 | 22-DIME PENTANE | |
| 20 | 0.03 | 0.04 | 0.04 | 24-DIME PENTANE | |
| 19 | 0.40 | 0.49 | 0.54 | 23-DIME PENTANE | |
| 15 | 0.12 | 0.16 | 0.17 | 2-ME HEXANE | |
| 16 | 0.09 | 0.12 | 0.13 | 3-ME HEXANE | |
| 37 | 4.87 | 6.89 | 7.51 | 224-TRIME PENTANE | * |
| 36 | 0.06 | 0.08 | 0.09 | 223-TRIME PENTANE | * |
| 31 | 0.17 | 0.24 | 0.26 | 25-DIME HEXANE | |
| 30 | 0.12 | 0.17 | 0.19 | 24-DIME HEXANE | |
| 39 | 0.09 | 0.12 | 0.13 | 234-TRIME PENTANE | * |
| 38 | 2.68 | 3.62 | 4.14 | 233-TRIME PENTANE | * |
| 34 | 0.01 | 0.01 | 0.01 | 2-ME-3-ET PENTANE | |
| 24 | 0.01 | 0.01 | 0.01 | 2-ME HEPTANE | |
| 25 | 0.01 | 0.01 | 0.01 | 3-ME HEPTANE | |
| 52 | 0.02 | 0.03 | 0.04 | 24-DIME HEPTANE | |
| 53 | 0.01 | 0.01 | 0.01 | 26-DIME HEPTANE | |
| 61 | 0.01 | 0.01 | 0.01 | 3-ME OCTANE | |

CYCLOPENTANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 800 | 4.90 | 3.96 | 4.65 | CYCLOPENTANE |
| 801 | 0.15 | 0.14 | 0.17 | ME CYCLOPENTANE |
| 848 | 0.01 | 0.02 | 0.02 | 113T4-TETRME CPENT |

CYCLOHEXANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 825 | 0.03 | 0.03 | 0.04 | CYCLOHEXANE |
| 831 | 0.03 | 0.04 | 0.05 | 1C3-DIME CYCHEXANE |
| 830 | 0.01 | 0.02 | 0.02 | 1T2-DIME CYCHEXANE |
| 956 | 0.01 | 0.02 | 0.02 | 1C3T5-TRIME CYCHEX |
| 941 | 0.01 | 0.01 | 0.01 | 1ME-C3ET CYCHEXANE |

AROMATIC HCS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 609 | 0.02 | 0.03 | 0.04 | 1-ME-3-ET BENZENE | |
| 610 | 0.01 | 0.01 | 0.02 | 1-ME-4-ET BENZENE | |
| 613 | 0.01 | 0.01 | 0.02 | 135-TRIME BENZENE | |
| 612 | 0.03 | 0.03 | 0.04 | 124-TRIME BENZENE | * |

UNCLASSIFIED HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 1009 | 3.47 | 2.20 | 2.72 | ISOBUTANOL |
| 188 | 0.01 | 0.02 | 0.02 | UNCLASS. H.C. C- 8 |

| | | | | |
|---|---|---|---|---|
| 189 | 0.02 | 0.02 | 0.03 | UNCLASS. H.C. C- 9 |
| 189 | 0.01 | 0.02 | 0.02 | UNCLASS. H.C. C- 9 |

SE-30 VC Run 1976 distillate batch 6.txt
CHEVRON RESEARCH GASOLINE ANALYSIS
ASTM DHAX METHOD

Sample ID: Run 1976 vapor condensate overheads
Acquisition Date & Time: 11/10/2014 10:00:04 AM
Channel: C108 (Offline)
Analysis: 108_141110_002.dat

*** DETAILED COMPOSITION, PERCENT ***

| C NO. | PARA | OLEF | NAPH | AROM | UNCL HC | TOTALS BY C # | NORMAL PARA | NON-ALKYL I-PARA | ALKYL I-PARA | CYCLO-PENT | CYCLO-HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| => BY WEIGHT | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 7.03 | **** | **** | **** | 2.74 | 9.77 | 0.27 | 6.76 | **** | **** | **** |
| 5 | 67.31 | **** | 5.10 | **** | **** | 72.41 | 0.20 | 67.10 | **** | 5.10 | **** |
| 6 | 3.82 | **** | 0.22 | **** | **** | 4.05 | 0.62 | 3.20 | **** | 0.19 | 0.04 |
| 7 | 0.96 | **** | 0.01 | **** | **** | 0.98 | **** | 0.96 | **** | **** | 0.01 |
| 8 | 12.42 | **** | 0.07 | **** | 0.01 | 12.51 | **** | 0.47 | 11.95 | **** | 0.07 |
| 9 | 0.08 | **** | 0.05 | 0.10 | 0.04 | 0.28 | 0.01 | 0.07 | **** | 0.02 | 0.03 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 91.63 | **** | 5.46 | 0.10 | 2.81 | 100.00 | 1.11 | 78.57 | 11.95 | 5.31 | 0.15 |
| => BY VOLUME | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 7.99 | **** | **** | **** | 2.22 | 10.21 | 0.30 | 7.70 | **** | **** | **** |
| 5 | 69.06 | **** | 4.36 | **** | **** | 73.41 | 0.21 | 68.85 | **** | 4.36 | **** |
| 6 | 3.72 | **** | 0.19 | **** | **** | 3.91 | 0.60 | 3.12 | **** | 0.16 | 0.03 |
| 7 | 0.89 | **** | 0.01 | **** | **** | 0.90 | **** | 0.89 | **** | **** | 0.01 |
| 8 | 11.25 | **** | 0.06 | **** | 0.01 | 11.32 | **** | 0.43 | 10.82 | **** | 0.06 |
| 9 | 0.07 | **** | 0.04 | 0.08 | 0.04 | 0.23 | 0.01 | 0.06 | **** | 0.02 | 0.03 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 92.99 | **** | 4.65 | 0.08 | 2.28 | 100.00 | 1.11 | 81.06 | 10.82 | 4.53 | 0.12 |
| => BY MOLAR | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 9.02 | **** | **** | **** | 3.51 | 12.53 | 0.35 | 8.67 | **** | **** | **** |
| 5 | 69.50 | **** | 5.42 | **** | **** | 74.91 | 0.21 | 69.29 | **** | 5.42 | **** |
| 6 | 3.30 | **** | 0.20 | **** | **** | 3.50 | 0.54 | 2.77 | **** | 0.17 | 0.03 |
| 7 | 0.72 | **** | 0.01 | **** | **** | 0.73 | **** | 0.72 | **** | **** | 0.01 |
| 8 | 8.10 | **** | 0.04 | **** | 0.01 | 8.16 | **** | 0.31 | 7.80 | **** | 0.04 |
| 9 | 0.05 | **** | 0.03 | 0.07 | 0.02 | 0.17 | 0.01 | 0.04 | **** | 0.01 | 0.02 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.00 | 0.00 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 90.68 | **** | 5.70 | 0.07 | 3.55 | 100.00 | 1.10 | 81.79 | 7.80 | 5.60 | 0.10 |

GRP. TYPE, VOL %: P = 95.16, O = 0.00, N = 4.76, A = 0.08, Saturates = 99.92
DIENE CONTENT = 0 vol ppm AVG MW= 74.5 API GR.= 89.3 SP. GR.= 0.6409
OCTANE NUMBER: (from pure values) RON = 93.8 MON = 90.8
(from blending values) RON = 92.4 MON = 88.3
CARBON-HYDROGEN RATIO = 5.042 STOICH. AIR-FUEL RATIO = 15.25 lbs air/lbs fuel
BTU/lb = 19251 NET, 20735 GROSS; BTU/gal = 102958 NET, 110897 GROSS
REID VAPOR PRESSURE = 21.7 BROMINE NO. = 0.0

* DISTILLATION CURVES

SE-30 VC Run 1976 distillate batch 6.txt

| VOL % | TBP | D86 |
|---|---|---|
| 0 | 11 | 83 |
| 5 | 11 | 83 |
| 10 | 82 | 83 |
| 15 | 82 | 83 |
| 20 | 82 | 83 |
| 25 | 82 | 83 |
| 30 | 82 | 83 |
| 35 | 82 | 83 |
| 40 | 82 | 83 |
| 45 | 82 | 83 |
| 50 | 82 | 83 |
| 55 | 82 | 83 |
| 60 | 82 | 83 |
| 65 | 82 | 83 |
| 70 | 82 | 83 |
| 75 | 82 | 83 |
| 80 | 121 | 121 |
| 85 | 156 | 181 |
| 90 | 211 | 210 |
| 95 | 211 | 236 |
| 100 | 365 | 238 |

* COMPOUND DICTIONARY NUMBERS AND AREAS AS READ IN

| CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 202431 | 4 | 8093 | 8 | 5875 | 7 | 2018075 | 6 | 6109 |
| 12 | 70674 | 800 | 158259 | 13 | 2365 | 10 | 12660 | 11 | 11270 |
| 9 | 18822 | 801 | 5800 | 18 | 1070 | 20 | 1480 | 1009 | 74282 |
| 825 | 1152 | 19 | 17192 | 15 | 5442 | 16 | 4139 | 37 | 233511 |
| 826 | 341 | 36 | 2847 | 31 | 7693 | 30 | 5681 | 39 | 4014 |
| 38 | 123819 | 34 | 551 | 24 | 385 | 831 | 1394 | 848 | 634 |
| 830 | 699 | 188 | 462 | 189 | 818 | 52 | 962 | 189 | 487 |
| 54 | 890 | 956 | 631 | 61 | 223 | 941 | 368 | 41 | 431 |
| 644 | 229 | 609 | 890 | 610 | 536 | 613 | 378 | 608 | 306 |
| 612 | 1083 | 191 | 313 | | | | | | |

TOTAL UNCORRECTED AREA = 3015766
NUMBER OF PEAKS READ IN = 47

* DETAILED HYDROCARBON ANALYSIS, EXCLUDING COMPOUNDS BELOW 0.01 VOLUME PERCENT

NORMAL PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4 | 0.35 | 0.30 | 0.27 | N-BUTANE |
| 6 | 0.21 | 0.21 | 0.20 | N-PENTANE |
| 9 | 0.54 | 0.60 | 0.62 | N-HEXANE |
| 41 | 0.01 | 0.01 | 0.01 | N-NONANE |

ISO-PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 5 | 8.67 | 7.70 | 6.76 | ISOBUTANE | |
| 8 | 0.20 | 0.21 | 0.19 | 22-DIME PROPANE | |
| 7 | 69.09 | 68.64 | 66.91 | ISOPENTANE | |
| 12 | 2.02 | 2.29 | 2.33 | 22-DIME BUTANE | |
| 13 | 0.07 | 0.08 | 0.08 | 23-DIME BUTANE | |
| 10 | 0.36 | 0.41 | 0.42 | 2-ME PENTANE | |
| 11 | 0.32 | 0.36 | 0.37 | 3-ME PENTANE | |
| 18 | 0.03 | 0.03 | 0.04 | 22-DIME PENTANE | |
| 20 | 0.04 | 0.05 | 0.05 | 24-DIME PENTANE | |
| 19 | 0.42 | 0.52 | 0.57 | 23-DIME PENTANE | |
| 15 | 0.13 | 0.17 | 0.18 | 2-ME HEXANE | |
| 16 | 0.10 | 0.13 | 0.14 | 3-ME HEXANE | |
| 37 | 5.00 | 7.06 | 7.66 | 224-TRIME PENTANE | * |
| 36 | 0.06 | 0.08 | 0.09 | 223-TRIME PENTANE | * |
| 31 | 0.16 | 0.23 | 0.25 | 25-DIME HEXANE | |
| 30 | 0.12 | 0.17 | 0.19 | 24-DIME HEXANE | |
| 39 | 0.09 | 0.12 | 0.13 | 234-TRIME PENTANE | * |
| 38 | 2.65 | 3.57 | 4.06 | 233-TRIME PENTANE | * |
| 34 | 0.01 | 0.02 | 0.02 | 2-ME-3-ET PENTANE | |
| 24 | 0.01 | 0.01 | 0.01 | 2-ME HEPTANE | |
| 52 | 0.02 | 0.03 | 0.03 | 24-DIME HEPTANE | |
| 54 | 0.02 | 0.03 | 0.03 | 25-DIME HEPTANE | |

CYCLOPENTANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 800 | 5.42 | 4.36 | 5.10 | CYCLOPENTANE |
| 801 | 0.17 | 0.16 | 0.19 | ME CYCLOPENTANE |
| 848 | 0.01 | 0.02 | 0.02 | 113T4-TETRME CPENT |

CYCLOHEXANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 825 | 0.03 | 0.03 | 0.04 | CYCLOHEXANE |
| 831 | 0.03 | 0.04 | 0.04 | 1C3-DIME CYCHEXANE |
| 830 | 0.01 | 0.02 | 0.02 | 1T2-DIME CYCHEXANE |
| 956 | 0.01 | 0.02 | 0.02 | 1C3T5-TRIME CYCHEX |

AROMATIC HCS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 609 | 0.02 | 0.02 | 0.03 | 1-ME-3-ET BENZENE | |
| 610 | 0.01 | 0.01 | 0.02 | 1-ME-4-ET BENZENE | |
| 612 | 0.02 | 0.02 | 0.03 | 124-TRIME BENZENE | * |

UNCLASSIFIED HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 1009 | 3.51 | 2.22 | 2.74 | ISOBUTANOL |
| 188 | 0.01 | 0.01 | 0.01 | UNCLASS. H.C. C- 8 |
| 189 | 0.02 | 0.02 | 0.03 | UNCLASS. H.C. C- 9 |
| 189 | 0.01 | 0.01 | 0.02 | UNCLASS. H.C. C- 9 |

SE-30 VC- Run 1986 distillate batch 7.txt
CHEVRON RESEARCH GASOLINE ANALYSIS
ASTM DHAX METHOD

Sample ID: Run 1986 vapor condensate
Acquisition Date & Time: 11/18/2014 11:10:01 AM
Channel: C108 (Offline)
Analysis: 108_141118_002.dat

*** DETAILED COMPOSITION, PERCENT ***

| C NO. | PARA | OLEF | NAPH | AROM | UNCL HC | TOTALS BY C # | NORMAL PARA | NON-ALKYL I-PARA | ALKYL I-PARA | CYCLO-PENT | CYCLO-HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| => BY WEIGHT | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 6.40 | **** | **** | **** | 3.81 | 10.21 | 0.26 | 6.14 | **** | **** | **** |
| 5 | 63.18 | **** | 5.13 | **** | **** | 68.32 | 0.19 | 62.99 | **** | 5.13 | **** |
| 6 | 3.92 | **** | 0.25 | **** | **** | 4.17 | 0.68 | 3.24 | **** | 0.21 | 0.04 |
| 7 | 1.17 | **** | 0.05 | **** | **** | 1.22 | 0.02 | 1.14 | **** | 0.01 | 0.04 |
| 8 | 15.54 | **** | 0.11 | **** | 0.03 | 15.67 | **** | 0.67 | 14.87 | 0.01 | 0.10 |
| 9 | 0.12 | **** | 0.07 | 0.15 | 0.06 | 0.40 | 0.03 | 0.10 | **** | 0.03 | 0.04 |
| 10 | 0.02 | **** | **** | **** | **** | 0.02 | 0.02 | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 90.35 | **** | 5.60 | 0.15 | 3.90 | 100.00 | 1.19 | 74.29 | 14.87 | 5.38 | 0.23 |
| => BY VOLUME | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 7.33 | **** | **** | **** | 3.11 | 10.44 | 0.29 | 7.04 | **** | **** | **** |
| 5 | 65.32 | **** | 4.42 | **** | **** | 69.74 | 0.19 | 65.13 | **** | 4.42 | **** |
| 6 | 3.85 | **** | 0.21 | **** | **** | 4.06 | 0.66 | 3.19 | **** | 0.18 | 0.04 |
| 7 | 1.09 | **** | 0.04 | **** | **** | 1.13 | 0.02 | 1.07 | **** | 0.01 | 0.03 |
| 8 | 14.18 | **** | 0.09 | **** | 0.02 | 14.29 | **** | 0.62 | 13.56 | 0.01 | 0.08 |
| 9 | 0.11 | **** | 0.06 | 0.11 | 0.05 | 0.33 | 0.02 | 0.09 | **** | 0.02 | 0.03 |
| 10 | 0.01 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 91.89 | **** | 4.81 | 0.11 | 3.19 | 100.00 | 1.20 | 77.13 | 13.56 | 4.63 | 0.19 |
| => BY MOLAR | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 8.31 | **** | **** | **** | 4.95 | 13.26 | 0.34 | 7.97 | **** | **** | **** |
| 5 | 66.05 | **** | 5.52 | **** | **** | 71.57 | 0.20 | 65.86 | **** | 5.52 | **** |
| 6 | 3.43 | **** | 0.23 | **** | **** | 3.65 | 0.59 | 2.84 | **** | 0.19 | 0.04 |
| 7 | 0.88 | **** | 0.04 | **** | **** | 0.92 | 0.02 | 0.86 | **** | 0.01 | 0.03 |
| 8 | 10.26 | **** | 0.07 | **** | 0.02 | 10.35 | **** | 0.44 | 9.82 | 0.01 | 0.07 |
| 9 | 0.07 | **** | 0.04 | 0.09 | 0.03 | 0.24 | 0.02 | 0.06 | **** | 0.02 | 0.03 |
| 10 | 0.01 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 89.01 | **** | 5.89 | 0.09 | 5.00 | 100.00 | 1.17 | 78.02 | 9.82 | 5.73 | 0.16 |

GRP. TYPE, VOL %: P = 94.91, O = 0.00, N = 4.97, A = 0.11, Saturates = 99.89
DIENE CONTENT = 0 vol ppm AVG MW= 75.4 API GR.= 87.6 SP. GR.= 0.6458
OCTANE NUMBER: (from pure values) RON = 94.0 MON = 90.8
(from blending values) RON = 92.5 MON = 88.3
CARBON-HYDROGEN RATIO = 5.054 STOICH. AIR-FUEL RATIO = 15.24 lbs air/lbs fuel
BTU/lb = 19228 NET, 20688 GROSS; BTU/gal = 103622 NET, 111492 GROSS
REID VAPOR PRESSURE = 20.5 BROMINE NO. = 0.0

* DISTILLATION CURVES

| VOL % | TBP | D86 |
|---|---|---|
| 0 | 11 | 83 |
| 5 | 11 | 83 |
| 10 | 82 | 83 |
| 15 | 82 | 83 |
| 20 | 82 | 83 |
| 25 | 82 | 83 |
| 30 | 82 | 83 |
| 35 | 82 | 83 |
| 40 | 82 | 83 |
| 45 | 82 | 83 |
| 50 | 82 | 83 |
| 55 | 82 | 83 |
| 60 | 82 | 83 |
| 65 | 82 | 83 |
| 70 | 82 | 83 |
| 75 | 121 | 121 |
| 80 | 146 | 162 |
| 85 | 194 | 210 |
| 90 | 211 | 210 |
| 95 | 239 | 238 |
| 100 | 345 | 243 |

* COMPOUND DICTIONARY NUMBERS AND AREAS AS READ IN

| CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 209833 | 4 | 8839 | 8 | 6237 | 7 | 2162637 | 6 | 6536 |
| 12 | 80113 | 800 | 181776 | 13 | 2893 | 10 | 15310 | 11 | 13747 |
| 9 | 23386 | 801 | 7324 | 18 | 1363 | 20 | 1866 | 1009 | 118051 |
| 825 | 1578 | 19 | 23443 | 15 | 7338 | 16 | 5707 | 806 | 245 |
| 37 | 326824 | 14 | 788 | 826 | 1446 | 36 | 4186 | 31 | 11462 |
| 30 | 8430 | 39 | 5805 | 38 | 180420 | 34 | 823 | 24 | 1206 |
| 26 | 471 | 831 | 1996 | 848 | 897 | 25 | 950 | 861 | 264 |
| 830 | 1071 | 188 | 894 | 189 | 1500 | 829 | 404 | 52 | 1522 |
| 189 | 539 | 53 | 451 | 956 | 932 | 60 | 720 | 61 | 684 |
| 941 | 551 | 41 | 928 | 644 | 423 | 609 | 1465 | 610 | 770 |
| 613 | 740 | 608 | 398 | 612 | 1726 | 100 | 534 | | |

TOTAL UNCORRECTED AREA = 3440442
NUMBER OF PEAKS READ IN = 54

* DETAILED HYDROCARBON ANALYSIS, EXCLUDING COMPOUNDS BELOW 0.01 VOLUME PERCENT

NORMAL PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4 | 0.34 | 0.29 | 0.26 | N-BUTANE |
| 6 | 0.20 | 0.19 | 0.19 | N-PENTANE |
| 9 | 0.59 | 0.66 | 0.68 | N-HEXANE |
| 14 | 0.02 | 0.02 | 0.02 | N-HEPTANE |

| | | | | |
|---|---|---|---|---|
| 41 | 0.02 | 0.02 | 0.03 | N-NONANE |
| 100 | 0.01 | 0.01 | 0.02 | N-DECANE |

ISO-PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 5 | 7.97 | 7.04 | 6.14 | ISOBUTANE | |
| 8 | 0.19 | 0.20 | 0.18 | 22-DIME PROPANE | |
| 7 | 65.67 | 64.93 | 62.81 | ISOPENTANE | |
| 12 | 2.03 | 2.29 | 2.32 | 22-DIME BUTANE | |
| 13 | 0.07 | 0.08 | 0.08 | 23-DIME BUTANE | |
| 10 | 0.39 | 0.43 | 0.44 | 2-ME PENTANE | |
| 11 | 0.35 | 0.38 | 0.40 | 3-ME PENTANE | |
| 18 | 0.03 | 0.04 | 0.04 | 22-DIME PENTANE | |
| 20 | 0.04 | 0.05 | 0.05 | 24-DIME PENTANE | |
| 19 | 0.51 | 0.62 | 0.68 | 23-DIME PENTANE | |
| 15 | 0.16 | 0.20 | 0.21 | 2-ME HEXANE | |
| 16 | 0.12 | 0.15 | 0.16 | 3-ME HEXANE | |
| 37 | 6.21 | 8.72 | 9.40 | 224-TRIME PENTANE | * |
| 36 | 0.08 | 0.11 | 0.12 | 223-TRIME PENTANE | * |
| 31 | 0.22 | 0.30 | 0.33 | 25-DIME HEXANE | |
| 30 | 0.16 | 0.22 | 0.24 | 24-DIME HEXANE | |
| 39 | 0.11 | 0.15 | 0.17 | 234-TRIME PENTANE | * |
| 38 | 3.43 | 4.59 | 5.19 | 233-TRIME PENTANE | * |
| 34 | 0.02 | 0.02 | 0.02 | 2-ME-3-ET PENTANE | |
| 24 | 0.02 | 0.03 | 0.03 | 2-ME HEPTANE | |
| 26 | 0.01 | 0.01 | 0.01 | 4-ME HEPTANE | |
| 25 | 0.02 | 0.02 | 0.03 | 3-ME HEPTANE | |
| 52 | 0.03 | 0.04 | 0.04 | 24-DIME HEPTANE | |
| 53 | 0.01 | 0.01 | 0.01 | 26-DIME HEPTANE | |
| 60 | 0.01 | 0.02 | 0.02 | 2-ME OCTANE | |
| 61 | 0.01 | 0.02 | 0.02 | 3-ME OCTANE | |

CYCLOPENTANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 800 | 5.52 | 4.42 | 5.13 | CYCLOPENTANE |
| 801 | 0.19 | 0.18 | 0.21 | ME CYCLOPENTANE |
| 848 | 0.02 | 0.02 | 0.03 | 113T4-TETRME CPENT |

CYCLOHEXANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 825 | 0.04 | 0.04 | 0.04 | CYCLOHEXANE |
| 826 | 0.03 | 0.03 | 0.04 | ME CYCLOHEXANE |
| 831 | 0.04 | 0.05 | 0.06 | 1C3-DIME CYCHEXANE |
| 830 | 0.02 | 0.03 | 0.03 | 1T2-DIME CYCHEXANE |
| 956 | 0.02 | 0.02 | 0.03 | 1C3T5-TRIME CYCHEX |
| 941 | 0.01 | 0.01 | 0.02 | 1ME-C3ET CYCHEXANE |

AROMATIC HCS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 609 | 0.02 | 0.03 | 0.04 | 1-ME-3-ET BENZENE | |
| 610 | 0.01 | 0.02 | 0.02 | 1-ME-4-ET BENZENE | |
| 613 | 0.01 | 0.01 | 0.02 | 135-TRIME BENZENE | |
| 612 | 0.03 | 0.03 | 0.05 | 124-TRIME BENZENE | * |

UNCLASSIFIED HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 1009 | 4.95 | 3.11 | 3.81 | ISOBUTANOL |
| 188 | 0.02 | 0.02 | 0.03 | UNCLASS. H.C. C- 8 |
| 189 | 0.03 | 0.04 | 0.04 | UNCLASS. H.C. C- 9 |
| 189 | 0.01 | 0.01 | 0.02 | UNCLASS. H.C. C- 9 |

108_150126_004c VC Run 2021 Batch 8 distillate.txt
CHEVRON RESEARCH GASOLINE ANALYSIS
ASTM DHAX METHOD

Sample ID: VC Run 2021 Batch 8 distillate
Acquisition Date & Time: 1/29/2015 10:30:01 AM
Channel: C108 (Offline)
Analysis: 108_150126_004c.dat

*** DETAILED COMPOSITION, PERCENT ***

| C NO. | PARA | OLEF | NAPH | AROM | UNCL HC | TOTALS BY C # | NORMAL PARA | NON-ALKYL I-PARA | ALKYL I-PARA | CYCLO-PENT | CYCLO-HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| => BY WEIGHT | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 9.25 | **** | **** | **** | 3.90 | 13.16 | 0.33 | 8.93 | **** | **** | **** |
| 5 | 63.73 | **** | 4.61 | **** | **** | 68.34 | 0.18 | 63.55 | **** | 4.61 | **** |
| 6 | 3.43 | 0.01 | 0.22 | 0.00 | **** | 3.65 | 0.56 | 2.87 | **** | 0.17 | 0.05 |
| 7 | 1.19 | 0.02 | 0.47 | **** | **** | 1.68 | 0.24 | 0.96 | **** | 0.03 | 0.44 |
| 8 | 12.62 | 0.00 | 0.24 | 0.00 | 0.00 | 12.87 | 0.07 | 0.88 | 11.67 | 0.04 | 0.19 |
| 9 | 0.05 | **** | 0.12 | 0.12 | 0.00 | 0.29 | 0.02 | 0.04 | **** | 0.05 | 0.06 |
| 10 | 0.01 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.00 | 0.00 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 90.28 | 0.03 | 5.65 | 0.13 | 3.91 | 100.00 | 1.39 | 77.22 | 11.67 | 4.91 | 0.74 |
| => BY VOLUME | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 10.53 | **** | **** | **** | 3.17 | 13.69 | 0.36 | 10.17 | **** | **** | **** |
| 5 | 65.44 | **** | 3.94 | **** | **** | 69.39 | 0.18 | 65.26 | **** | 3.94 | **** |
| 6 | 3.34 | 0.01 | 0.18 | 0.00 | **** | 3.53 | 0.54 | 2.80 | **** | 0.14 | 0.04 |
| 7 | 1.10 | 0.02 | 0.39 | **** | **** | 1.51 | 0.22 | 0.88 | **** | 0.03 | 0.37 |
| 8 | 11.43 | 0.00 | 0.20 | 0.00 | 0.00 | 11.64 | 0.06 | 0.81 | 10.56 | 0.04 | 0.16 |
| 9 | 0.05 | **** | 0.09 | 0.09 | 0.00 | 0.23 | 0.01 | 0.04 | **** | 0.04 | 0.05 |
| 10 | 0.00 | **** | **** | **** | **** | 0.00 | 0.00 | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.00 | 0.00 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 91.90 | 0.02 | 4.81 | 0.09 | 3.17 | 100.00 | 1.38 | 79.96 | 10.56 | 4.19 | 0.61 |
| => BY MOLAR | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 11.79 | **** | **** | **** | 4.98 | 16.77 | 0.41 | 11.38 | **** | **** | **** |
| 5 | 65.44 | **** | 4.87 | **** | **** | 70.31 | 0.19 | 65.25 | **** | 4.87 | **** |
| 6 | 2.95 | 0.01 | 0.19 | 0.00 | **** | 3.14 | 0.48 | 2.46 | **** | 0.15 | 0.04 |
| 7 | 0.88 | 0.01 | 0.36 | **** | **** | 1.25 | 0.17 | 0.71 | **** | 0.02 | 0.33 |
| 8 | 8.19 | 0.00 | 0.16 | 0.00 | 0.00 | 8.35 | 0.05 | 0.57 | 7.57 | 0.03 | 0.13 |
| 9 | 0.03 | **** | 0.07 | 0.07 | 0.00 | 0.18 | 0.01 | 0.02 | **** | 0.03 | 0.04 |
| 10 | 0.00 | **** | **** | **** | **** | 0.00 | 0.00 | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.00 | 0.00 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 89.28 | 0.02 | 5.64 | 0.08 | 4.98 | 100.00 | 1.31 | 80.40 | 7.57 | 5.10 | 0.54 |

GRP. TYPE, VOL %: P = 94.91, O = 0.03, N = 4.96, A = 0.10, Saturates = 99.88
DIENE CONTENT = 0 vol ppm AVG MW= 74.1 API GR.= 89.1 SP. GR.= 0.6414
OCTANE NUMBER: (from pure values) RON = 93.7 MON = 90.5
(from blending values) RON = 92.5 MON = 88.3
CARBON-HYDROGEN RATIO = 5.037 STOICH. AIR-FUEL RATIO = 15.26 lbs air/lbs fuel
BTU/lb = 19242 NET, 20728 GROSS; BTU/gal = 103001 NET, 110951 GROSS
REID VAPOR PRESSURE = 22.8 BROMINE NO. = 0.0

* DISTILLATION CURVES

| VOL % | TBP | D86 |
|---|---|---|
| 0 | 11 | 83 |
| 5 | 11 | 83 |
| 10 | 11 | 83 |
| 15 | 82 | 83 |
| 20 | 82 | 83 |
| 25 | 82 | 83 |
| 30 | 82 | 83 |
| 35 | 82 | 83 |
| 40 | 82 | 83 |
| 45 | 82 | 83 |
| 50 | 82 | 83 |
| 55 | 82 | 83 |
| 60 | 82 | 83 |
| 65 | 82 | 83 |
| 70 | 82 | 83 |
| 75 | 82 | 121 |
| 80 | 122 | 122 |
| 85 | 181 | 181 |
| 90 | 211 | 210 |
| 95 | 228 | 238 |
| 100 | 365 | 245 |

* COMPOUND DICTIONARY NUMBERS AND AREAS AS READ IN

| CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 962806 | 4 | 35075 | 8 | 22967 | 7 | 6883210 | 6 | 19655 |
| 12 | 227390 | 800 | 515535 | 13 | 7619 | 10 | 40978 | 11 | 36983 |
| 317 | 520 | 9 | 61009 | 801 | 18841 | 18 | 3191 | 1009 | 381367 |
| 600 | 385 | 451 | 166 | 825 | 5316 | 19 | 60355 | 15 | 22059 |
| 16 | 19037 | 806 | 734 | 807 | 725 | 805 | 1003 | 37 | 804453 |
| 2010 | 2110 | 14 | 25775 | 826 | 49181 | 811 | 781 | 28 | 3367 |
| 802 | 966 | 36 | 10007 | 31 | 32489 | 30 | 25907 | 817 | 1326 |
| 32 | 1859 | 814 | 869 | 39 | 14627 | 38 | 451707 | 4528 | 319 |
| 34 | 4019 | 24 | 13529 | 26 | 4754 | 831 | 9452 | 848 | 3503 |
| 25 | 11075 | 828 | 740 | 864 | 442 | 861 | 1461 | 830 | 3173 |
| 832 | 3131 | 833 | 371 | 23 | 7691 | 829 | 909 | 827 | 3846 |
| 946 | 1486 | 53 | 1020 | 4329 | 1574 | 189 | 256 | 602 | 275 |
| 956 | 2259 | 4331 | 558 | 880 | 379 | 56 | 531 | 4332 | 426 |
| 62 | 541 | 60 | 1059 | 945 | 420 | 953 | 690 | 61 | 1172 |
| 970 | 264 | 941 | 1215 | 944 | 442 | 948 | 329 | 41 | 1696 |
| 644 | 1252 | 609 | 3884 | 610 | 1832 | 613 | 1728 | 608 | 1122 |
| 612 | 4456 | 100 | 587 | 191 | 341 | | | | |

TOTAL UNCORRECTED AREA = 10852559
NUMBER OF PEAKS READ IN = 83

* DETAILED HYDROCARBON ANALYSIS, EXCLUDING COMPOUNDS BELOW 0.01 VOLUME PERCENT

NORMAL PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 4 | 0.41 | 0.36 | 0.33 | N-BUTANE | |
| 6 | 0.19 | 0.18 | 0.18 | N-PENTANE | |
| 9 | 0.48 | 0.54 | 0.56 | N-HEXANE | |
| 14 | 0.17 | 0.22 | 0.24 | N-HEPTANE | |
| 23 | 0.05 | 0.06 | 0.07 | N-OCTANE | |
| 41 | 0.01 | 0.01 | 0.02 | N-NONANE | |

ISO-PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 5 | 11.38 | 10.17 | 8.93 | ISOBUTANE | |
| 8 | 0.22 | 0.23 | 0.21 | 22-DIME PROPANE | |
| 7 | 65.03 | 65.03 | 63.34 | ISOPENTANE | |
| 12 | 1.79 | 2.04 | 2.08 | 22-DIME BUTANE | |
| 13 | 0.06 | 0.07 | 0.07 | 23-DIME BUTANE | |
| 10 | 0.32 | 0.37 | 0.38 | 2-ME PENTANE | |
| 11 | 0.29 | 0.32 | 0.34 | 3-ME PENTANE | |
| 18 | 0.02 | 0.03 | 0.03 | 22-DIME PENTANE | |
| 19 | 0.41 | 0.51 | 0.55 | 23-DIME PENTANE | |
| 15 | 0.15 | 0.19 | 0.20 | 2-ME HEXANE | |
| 16 | 0.13 | 0.16 | 0.17 | 3-ME HEXANE | |
| 37 | 4.75 | 6.75 | 7.33 | 224-TRIME PENTANE | * |
| 28 | 0.02 | 0.03 | 0.03 | 22-DIME HEXANE | |
| 36 | 0.06 | 0.08 | 0.09 | 223-TRIME PENTANE | * |
| 31 | 0.19 | 0.27 | 0.30 | 25-DIME HEXANE | |
| 30 | 0.15 | 0.21 | 0.24 | 24-DIME HEXANE | |
| 32 | 0.01 | 0.02 | 0.02 | 33-DIME HEXANE | |
| 39 | 0.09 | 0.12 | 0.13 | 234-TRIME PENTANE | * |
| 38 | 2.67 | 3.61 | 4.11 | 233-TRIME PENTANE | * |
| 34 | 0.02 | 0.03 | 0.04 | 2-ME-3-ET PENTANE | |
| 24 | 0.08 | 0.11 | 0.12 | 2-ME HEPTANE | |
| 26 | 0.03 | 0.04 | 0.04 | 4-ME HEPTANE | |
| 25 | 0.07 | 0.09 | 0.10 | 3-ME HEPTANE | |

CYCLOPENTANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 800 | 4.87 | 3.94 | 4.61 | CYCLOPENTANE |
| 801 | 0.15 | 0.14 | 0.17 | ME CYCLOPENTANE |
| 817 | 0.01 | 0.01 | 0.01 | 1T2C4TRIME CPENTANE |
| 848 | 0.02 | 0.03 | 0.03 | 113T4-TETRME CPENT |
| 861 | 0.01 | 0.01 | 0.01 | 1ME-1ET CYCPENTANE |
| 4329 | 0.01 | 0.01 | 0.01 | C-9 NAPHTHENE E |

CYCLOHEXANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 825 | 0.04 | 0.04 | 0.05 | CYCLOHEXANE |
| 826 | 0.33 | 0.36 | 0.44 | ME CYCLOHEXANE |
| 831 | 0.06 | 0.07 | 0.08 | 1C3-DIME CYCHEXANE |
| 830 | 0.02 | 0.02 | 0.03 | 1T2-DIME CYCHEXANE |
| 832 | 0.02 | 0.02 | 0.03 | 1T3-DIME CYCHEXANE |

| | | | | |
|---|---|---|---|---|
| 827 | 0.02 | 0.03 | 0.03 | ETHYL CYCLOHEXANE |
| 946 | 0.01 | 0.01 | 0.01 | 113-TRIME CYCHEXANE |
| 956 | 0.01 | 0.02 | 0.02 | 1C3T5-TRIME CYCHEX |

OLEFINS, DIENES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 2010 | 0.01 | 0.02 | 0.02 | 34-DIME-C2-PENTENE |

AROMATIC HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 609 | 0.02 | 0.02 | 0.03 | 1-ME-3-ET BENZENE |
| 610 | 0.01 | 0.01 | 0.02 | 1-ME-4-ET BENZENE |
| 613 | 0.01 | 0.01 | 0.01 | 135-TRIME BENZENE |
| 612 | 0.02 | 0.03 | 0.04 | 124-TRIME BENZENE * |

UNCLASSIFIED HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 1009 | 4.98 | 3.17 | 3.90 | ISOBUTANOL |

SE-30 VC- Batch 9 Run 2022 distillate.txt
CHEVRON RESEARCH GASOLINE ANALYSIS
ASTM DHAX METHOD

Sample ID: VC Run 2022 Batch 9 distillate
Acquisition Date & Time: 1/26/2015 12:07:23 PM
Channel: C108 (Offline)
Analysis: 108_150126_003.dat

*** DETAILED COMPOSITION, PERCENT ***

| C NO. | PARA | OLEF | NAPH | AROM | UNCL HC | TOTALS BY C # | NORMAL PARA | NON-ALKYL I-PARA | ALKYL I-PARA | CYCLO-PENT | CYCLO-HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| => BY WEIGHT | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 9.80 | **** | **** | **** | 2.51 | 12.30 | 0.33 | 9.47 | **** | **** | **** |
| 5 | 66.27 | **** | 4.89 | **** | **** | 71.16 | 0.19 | 66.08 | **** | 4.89 | **** |
| 6 | 3.63 | **** | 0.21 | **** | **** | 3.84 | 0.56 | 3.07 | **** | 0.17 | 0.04 |
| 7 | 0.86 | **** | 0.01 | **** | **** | 0.87 | **** | 0.86 | **** | **** | 0.01 |
| 8 | 11.43 | **** | 0.10 | **** | 0.02 | 11.55 | **** | 0.45 | 10.98 | **** | 0.10 |
| 9 | 0.06 | **** | 0.05 | 0.12 | 0.04 | 0.26 | 0.02 | 0.04 | **** | 0.02 | 0.03 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.02 | 0.02 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 92.04 | **** | 5.26 | 0.12 | 2.58 | 100.00 | 1.11 | 79.96 | 10.98 | 5.08 | 0.18 |
| => BY VOLUME | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 11.08 | **** | **** | **** | 2.02 | 13.10 | 0.36 | 10.72 | **** | **** | **** |
| 5 | 67.64 | **** | 4.15 | **** | **** | 71.79 | 0.20 | 67.44 | **** | 4.15 | **** |
| 6 | 3.52 | **** | 0.18 | **** | **** | 3.69 | 0.54 | 2.98 | **** | 0.15 | 0.03 |
| 7 | 0.79 | **** | 0.01 | **** | **** | 0.80 | **** | 0.79 | **** | **** | 0.01 |
| 8 | 10.29 | **** | 0.08 | **** | 0.02 | 10.39 | **** | 0.41 | 9.89 | **** | 0.08 |
| 9 | 0.05 | **** | 0.04 | 0.08 | 0.03 | 0.21 | 0.02 | 0.04 | **** | 0.02 | 0.02 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.02 | 0.02 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 93.37 | **** | 4.46 | 0.08 | 2.08 | 100.00 | 1.11 | 82.37 | 9.89 | 4.32 | 0.14 |
| => BY MOLAR | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 12.42 | **** | **** | **** | 3.18 | 15.61 | 0.42 | 12.01 | **** | **** | **** |
| 5 | 67.71 | **** | 5.14 | **** | **** | 72.85 | 0.20 | 67.51 | **** | 5.14 | **** |
| 6 | 3.10 | **** | 0.18 | **** | **** | 3.29 | 0.48 | 2.62 | **** | 0.15 | 0.03 |
| 7 | 0.63 | **** | 0.01 | **** | **** | 0.64 | **** | 0.63 | **** | **** | 0.01 |
| 8 | 7.38 | **** | 0.06 | **** | 0.01 | 7.45 | **** | 0.29 | 7.09 | **** | 0.06 |
| 9 | 0.04 | **** | 0.03 | 0.07 | 0.02 | 0.16 | 0.01 | 0.02 | **** | 0.01 | 0.02 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 91.28 | **** | 5.42 | 0.07 | 3.22 | 100.00 | 1.11 | 83.08 | 7.09 | 5.30 | 0.12 |

GRP. TYPE, VOL %: P = 95.36, O = 0.00, N = 4.55, A = 0.09, Saturates = 99.91
DIENE CONTENT = 0 vol ppm AVG MW= 73.7 API GR.= 90.5 SP. GR.= 0.6375
OCTANE NUMBER: (from pure values) RON = 94.0 MON = 91.0
(from blending values) RON = 92.7 MON = 88.5
CARBON-HYDROGEN RATIO = 5.031 STOICH. AIR-FUEL RATIO = 15.26 lbs air/lbs fuel
BTU/lb = 19258 NET, 20752 GROSS; BTU/gal = 102455 NET, 110403 GROSS
REID VAPOR PRESSURE = 23.7 BROMINE NO. = 0.0

* DISTILLATION CURVES

SE-30 VC- Batch 9 Run 2022 distillate.txt

| VOL % | TBP | D86 |
|---|---|---|
| 0 | 11 | 83 |
| 5 | 11 | 83 |
| 10 | 11 | 83 |
| 15 | 82 | 83 |
| 20 | 82 | 83 |
| 25 | 82 | 83 |
| 30 | 82 | 83 |
| 35 | 82 | 83 |
| 40 | 82 | 83 |
| 45 | 82 | 83 |
| 50 | 82 | 83 |
| 55 | 82 | 83 |
| 60 | 82 | 83 |
| 65 | 82 | 83 |
| 70 | 82 | 83 |
| 75 | 82 | 83 |
| 80 | 121 | 121 |
| 85 | 122 | 156 |
| 90 | 211 | 210 |
| 95 | 211 | 228 |
| 100 | 365 | 238 |

* COMPOUND DICTIONARY NUMBERS AND AREAS AS READ IN

| CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 254937 | 4 | 8913 | 8 | 5864 | 7 | 1787652 | 6 | 5247 |
| 12 | 60750 | 800 | 136495 | 13 | 2102 | 10 | 10893 | 11 | 9821 |
| 9 | 15358 | 801 | 4836 | 18 | 856 | 20 | 1191 | 1009 | 61201 |
| 825 | 996 | 19 | 13802 | 15 | 4278 | 16 | 3342 | 37 | 191556 |
| 826 | 387 | 36 | 2403 | 31 | 6567 | 30 | 4931 | 39 | 3379 |
| 38 | 103735 | 34 | 439 | 24 | 381 | 831 | 1224 | 848 | 524 |
| 830 | 591 | 188 | 496 | 189 | 707 | 827 | 924 | 189 | 325 |
| 54 | 987 | 956 | 519 | 61 | 202 | 941 | 297 | 41 | 498 |
| 644 | 277 | 609 | 842 | 610 | 465 | 613 | 400 | 608 | 300 |
| 612 | 1127 | 191 | 525 | | | | | | |

TOTAL UNCORRECTED AREA = 2713542
NUMBER OF PEAKS READ IN = 47

* DETAILED HYDROCARBON ANALYSIS, EXCLUDING COMPOUNDS BELOW 0.01 VOLUME PERCENT

NORMAL PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4 | 0.42 | 0.36 | 0.33 | N-BUTANE |
| 6 | 0.20 | 0.20 | 0.19 | N-PENTANE |
| 9 | 0.48 | 0.54 | 0.56 | N-HEXANE |
| 41 | 0.01 | 0.02 | 0.02 | N-NONANE |

ISO-PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 5 | 12.01 | 10.72 | 9.47 | ISOBUTANE | |
| 8 | 0.22 | 0.23 | 0.22 | 22-DIME PROPANE | |
| 7 | 67.29 | 67.21 | 65.86 | ISOPENTANE | |
| 12 | 1.91 | 2.17 | 2.23 | 22-DIME BUTANE | |
| 13 | 0.07 | 0.07 | 0.08 | 23-DIME BUTANE | |
| 10 | 0.34 | 0.39 | 0.40 | 2-ME PENTANE | |
| 11 | 0.31 | 0.34 | 0.36 | 3-ME PENTANE | |
| 18 | 0.02 | 0.03 | 0.03 | 22-DIME PENTANE | |
| 20 | 0.03 | 0.04 | 0.04 | 24-DIME PENTANE | |
| 19 | 0.37 | 0.46 | 0.50 | 23-DIME PENTANE | |
| 15 | 0.12 | 0.15 | 0.16 | 2-ME HEXANE | |
| 16 | 0.09 | 0.11 | 0.12 | 3-ME HEXANE | |
| 37 | 4.51 | 6.40 | 6.99 | 224-TRIME PENTANE | * |
| 36 | 0.06 | 0.08 | 0.09 | 223-TRIME PENTANE | * |
| 31 | 0.15 | 0.22 | 0.24 | 25-DIME HEXANE | |
| 30 | 0.12 | 0.16 | 0.18 | 24-DIME HEXANE | |
| 39 | 0.08 | 0.11 | 0.12 | 234-TRIME PENTANE | * |
| 38 | 2.44 | 3.30 | 3.78 | 233-TRIME PENTANE | * |
| 34 | 0.01 | 0.01 | 0.02 | 2-ME-3-ET PENTANE | |
| 24 | 0.01 | 0.01 | 0.01 | 2-ME HEPTANE | |
| 54 | 0.02 | 0.03 | 0.04 | 25-DIME HEPTANE | |

CYCLOPENTANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 800 | 5.14 | 4.15 | 4.89 | CYCLOPENTANE |
| 801 | 0.15 | 0.15 | 0.17 | ME CYCLOPENTANE |
| 848 | 0.01 | 0.02 | 0.02 | 113T4-TETRME CPENT |

CYCLOHEXANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 825 | 0.03 | 0.03 | 0.04 | CYCLOHEXANE |
| 826 | 0.01 | 0.01 | 0.01 | ME CYCLOHEXANE |
| 831 | 0.03 | 0.04 | 0.04 | 1C3-DIME CYCHEXANE |
| 830 | 0.01 | 0.02 | 0.02 | 1T2-DIME CYCHEXANE |
| 827 | 0.02 | 0.03 | 0.03 | ETHYL CYCLOHEXANE |
| 956 | 0.01 | 0.02 | 0.02 | 1C3T5-TRIME CYCHEX |

AROMATIC HCS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 609 | 0.02 | 0.02 | 0.03 | 1-ME-3-ET BENZENE | |
| 610 | 0.01 | 0.01 | 0.02 | 1-ME-4-ET BENZENE | |
| 612 | 0.02 | 0.03 | 0.04 | 124-TRIME BENZENE | * |

UNCLASSIFIED HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 1009 | 3.18 | 2.02 | 2.51 | ISOBUTANOL |
| 188 | 0.01 | 0.02 | 0.02 | UNCLASS. H.C. C- 8 |
| 189 | 0.01 | 0.02 | 0.03 | UNCLASS. H.C. C- 9 |
| 191 | 0.01 | 0.02 | 0.02 | UNCLASS. H.C. C-11 |

# Appendix D
# Toxicology Report for Gasoline Isobutanol Vapor Condensate: A 13-week Inhalation Toxicity Study in Rats with Neurotoxicity, Genotoxicity, and Immunotoxicity Assessments and with a 4-week Recovery

# Report Amendment 1

# Gasoline Isobutanol Vapor Condensate: A 13-Week Inhalation Toxicity Study in Rats with Neurotoxicity, Genotoxicity and Immunotoxicity Assessments and with a 4-Week Recovery

| | |
|---|---|
| **Envigo Study Number:** | 14-6485 |
| **Sponsor Name:** | Butamax Advanced Biofuels, LLC |
| **Issue Date:** | 22 April 2016 |
| **Study Director:** | Gary M. Hoffman, BA, DABT |
| **Testing Facility:** | Envigo CRS, Inc.<br>PO Box 2360<br>Mettlers Road<br>East Millstone, New Jersey 08875-2360 |

On 21 September 2015 the legal entity Huntingdon Life Sciences, Inc. was renamed as Envigo CRS, Inc. No other changes to the legal entity have occurred.

## STUDY DIRECTOR AND QA SIGNATURES

The changes described in this amendment fully and accurately reflect the data generated.

[redacted] 22 April 2016

Gary M. Hoffman, BA, DABT
Study Director
Envigo CRS, Inc.

Date

This amendment was inspected on 18 and 22 April 2016 by the Quality Assurance Unit at the Test Facility Envigo, Princeton Research Center. Results of the inspection were reported to the Study Director and Management on 18 and 22 April 2016.

[redacted] 22 Apr 2016

Katrina Neetz, M.S., RQAP-GLP
QA Unit Head (Toxicology)
Envigo CRS, Inc.

Date

## REASONS AND JUSTIFICATION FOR CHANGES

1. The duration of the daily exposures was added

2. Due to oversight, the duration of exposures for the neurobehavioral and neuropathologic portion of this study was indicated as 4 weeks; however, the actual duration of exposures was 13 weeks.

## AMENDMENT DETAILS

This amendment modifies the following portions of the final report. Additions are indicated in **underlined bold text**; deletions are indicated in ~~**bold strikethrough text**~~.

1. First sentence in the 1st paragraph on Page 12 (Summary):

Sprague-Dawley CD® rats (20/sex/group for Groups 1 and 4 and 10/sex/group for Groups 2 and 3) were exposed once daily, **6 hours/day,** 5 days/week by whole-body exposure to 0 (air only), 2,000, 10,000 or 20,000 mg/m3 Gasoline Isobutanol Vapor Condensate for 13 consecutive weeks.

2. Text table on Page 13 (Summary):

The NOAEL for study endpoints are summarized in the following table:

| Study Type [Laboratory] | Duration of Exposures | Basis for NOAEL | NOAEL |
|---|---|---|---|
| Inhalation Subchronic[a] [Envigo, East Millstone, NJ] | 13 weeks | Negative | 20,000 mg/m$^3$ |
| Neurobehavioral and Neuropathologic Effects [Envigo, Eye Suffolk, England] | ~~4 weeks~~ **13 weeks** | Negative | 20,000 mg/m$^3$ |
| Micronucleus [Envigo, Eye Suffolk, England] | 4 weeks | Negative | 20,000 mg/m$^3$ |
| Immunotoxicity [ImmunoTox Inc, Richmond, VA] | 4 weeks | Negative | 20,000 mg/m$^3$ |
| GFAP [Molecular Neurotoxicology Lab - NIOSH, Morgantown, VA] | 13 weeks | Negative | 20,000 mg/m$^3$ |

[a]Light Hydrocarbon Nephropathy observed in males at 20,000 mg/m$^3$ exposure level

# REPORT

# Gasoline Isobutanol Vapor Condensate: A 13-Week Inhalation Toxicity Study in Rats with Neurotoxicity, Genotoxicity and Immunotoxicity Assessments and with a 4-Week Recovery

On 21 September 2015 the legal entity Huntingdon Life Sciences, Inc was renamed as Envigo CRS, Inc. No other changes to the legal entity have occurred.

| | |
|---|---|
| **Envigo study number:** | 14-6485 |
| **Version ID:** | Final |
| **Issue date:** | 25 March 2016 |

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# Statement of Compliance

## Gasoline Isobutanol Vapor Condensate: A 13-Week Inhalation Toxicity Study in Rats with Neurotoxicity, Genotoxicity and Immunotoxicity Assessments and with a 4-Week Recovery

This study was conducted in compliance with the following Good Laboratory Practice standards:

> United States Environmental Protection Agency's Good Laboratory Practice Standards 79.60, CFR Vol. 59, No. 122, 27 June 1994.

Statistical analysis, genotoxicity analysis and neurohistopathology and neuropathology performed by Envigo-UK were conducted in compliance with the following Good Laboratory Practice standards:

> The UK Good Laboratory Practice Regulations (Statutory Instrument 1999 No. 3106, as amended by Statutory Instrument 2004 No.994)
>
> EC Commission Directive 2004/10/EC of 11 February 2004 (Official Journal No L 50/44)
>
> Organization for Economic Cooperation and Development (OECD) Principles of Good Laboratory Practices ENV/MC/CHEM/(98)17

With the exception of the following that were not considered to have impacted the validity or integrity of the study:

The GFAP analysis was not conducted in full compliance with the above referenced GLPs because the US Centers for Disease Control and Prevention Health Effects Laboratory Division – NIOSH laboratory is not a GLP laboratory. The GFAP analysis was conducted in the spirit of GLP and in accordance with the protocol and the Standard Operating Procedures.

Specimens obtained from mutagenicity tests and wet specimens of biological fluids need QA verification prior to disposal. However, samples were disposed of on 20 November 2015 without QA verification.

The expiry date for the test substance is not available.

Test substance analysis by Chevron Energy & Technology Company was done non-GLP.

[redacted]

Gary M. Hoffman, BA, DABT
Study Director
Envigo

25 March 2016
Date

# Signature Page

## Gasoline Isobutanol Vapor Condensate: A 13-Week Inhalation Toxicity Study in Rats with Neurotoxicity, Genotoxicity and Immunotoxicity Assessments and with a 4-Week Recovery

The following Scientist was responsible for the overall conduct of this study:

Gary M. Hoffman, BA, DABT
Study Director
Envigo

25 MARCH 2016
Date

The following Scientists have reviewed and approved this report:

[redacted]
Catherine M. Kelly, BS
Vice President, Safety Assessment
Envigo

24 Mar 16
Date

[redacted]
Cynthia Willard-Mack, VMD, PhD
Director of Pathology
Envigo

24 Mar 16
Date

# Quality Assurance Statement

## Gasoline Isobutanol Vapor Condensate: A 13-Week Inhalation Toxicity Study in Rats with Neurotoxicity, Genotoxicity and Immunotoxicity Assessments and with a 4-Week Recovery

Listed below are the dates that this study was inspected by the Quality Assurance Unit of Envigo, East Millstone, New Jersey, and the dates that findings were reported to the Study Director and Management. This report reflects the raw data as far as can be reasonably established.

| Type of Inspection | Date(s) of Inspection | Reported to Study Director and Management |
|---|---|---|
| GLP Protocol Review | 30 Jan 2015 | 30 Jan 2015 |
| Expsoure Monitoring, Pharmacy Data Review and Equipment Records | 23 Feb 2015 | 23 Feb 2015 |
| Test Atmosphere Analysis | 30 Mar 2015 | 30 Mar 2015 |
| Immunotoxicity Sacrifice and Tissue Collection, and Protocol Amendments 1-2 | 30 Apr 2015 | 30 Apr 2015 |
| Terminal Necropsy | 26 May 2015 | 26 May 2015 |
| Perfusion and Training Records | 28 May 2015 | 28 May 2015 |
| Analytical Formulation Report and Data | 10,14 Dec 2015 | 15 Dec 2015 |
| Draft Final Report Text, Tables, Appendices, Data and Protocol Amendments 3-6 | 3, 4, 7-10, 18, 21, 29-30 Dec 2015 | 30 Dec 2015 |
| Inhalation Technology Report and Data | 31 Dec 2015, 4 Jan 2016 | 04 Jan 2016 |
| Draft Final Report Results & Discussion, Summary, Anatomic Pathology, Clinical Pathology, Statistical Analysis Reports and Data | 5 Jan 2016- 8 Jan 2016 | 08 Jan 2016 |
| Final Report Review and Protocol Amendment 7 | 3, 7 Mar 2016 | 7 Mar 2016 |

[redacted]

Kathleen Stilwell AS, BS, LATg, SRS
Quality Assurance Auditor

24 MAR 2016

Date

# Details of Sponsor, Test Facility and Test Sites

| | |
|---|---|
| **Sponsor** | Butamax Advanced Biofuels, LLC<br>200 Powder Mill Road, E356 Third Floor<br>Wilmington, Delaware 19880-0356 |
| **Test facility** | Envigo<br>PO Box 2360<br>Mettlers Road<br>East Millstone, New Jersey 08875-2360 |
| **Test site [Genotoxicity]** | Envigo<br>Woolley Road<br>Alconbury, Huntingdon<br>Cambridgeshire PE28 4HS<br>United Kingdom |
| **Test site [Immunotoxicity]** | ImmunoTox, A Division of AIBioTech<br>601 Biotech Drive<br>Richmond, Virginia 23235 |
| **Test site [GFAP Assays]** | US Centers for Disease Control (CDC) and Prevention<br>Health Effects Laboratory Division – NIOSH<br>1095 Willowdale Road<br>Morgantown, West Virginia 26505-2888 |
| **Test site [Neurohistology and and neuropathology]** | Envigo<br>Occold<br>Eye, Suffolk IP23 7PX<br>United Kingdom |

# Contributing Scientists

| | |
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| **Vice President, Toxicology Operations** | Ian Vanterpool, FIAT |
| **Director, Pathology** | Cynthia Willard-Mack, VMD, PhD |
| **Director, Quality Assurance** | Melissa Elliott, BS, RQAP-GLP |
| **Study Director** | Gary M. Hoffman, BA, DABT |
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| **Rodent/Reproductive Toxicology** | Thomas Jones, BS, AALAS LATG |
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| **Responsible Scientist, Aerosol Technologist** | Justine M. Damiano, BS |
| **Responsible Scientist, Pathologist** | Molly Boyle, DVM, MPH, DACVP |
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|---|---|
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# Summary

## Gasoline Isobutanol Vapor Condensate: A 13-Week Inhalation Toxicity Study in Rats with Neurotoxicity, Genotoxicity and Immunotoxicity Assessments and with a 4-Week Recovery

Sprague-Dawley CD® rats (20/sex/group for Groups 1 and 4 and 10/sex/group for Groups 2 and 3) were exposed once daily, 5 days/week by whole-body exposure to 0 (air only), 2,000, 10,000 or 20,000 mg/m$^3$ Gasoline Isobutanol Vapor Condensate for 13 consecutive weeks. At the end of the treatment period, 10 animals/sex/group were euthanized and necropsied.

Satellite animals (15 males and 25 females per group) were similarly exposed for the evaluation of neuropathology, genotoxicity or GFAP (5 animals/sex/group/evaluation) or for immunotoxicity (10 females/group). Positive control animals for the genotoxicity study (5 animals/sex) received a single 20 mg/kg dose of cyclophosphamide via oral gavage within 24 hours prior to sacrifice and positive control animals for the immunotoxicity study (10 females) received 50 mg/kg of cyclophosphamide via intraperitoneal inject once daily for 4 days prior to sacrifice. These positive control animals were not chamber exposed prior to dosing and sacrifice.

Parameters evaluated during the study were: viability, clinical observations, ophthalmology, body weights, food consumption, clinical pathology (after 4 weeks of exposures [hematology and clinical chemistry only] and after the end of the exposure period), organ weights, macroscopic observations and microscopic pathology.

Gas chromatography (GC) analysis of the major components in the neat test substance and the test atmospheres showed a reasonably close comparison between the neat test substance and the vaporized test substance. This data demonstrated that the test animals were exposed, as expected, to all of the major components of the test substance in their reasonably proper proportion. The data were consistent from week-to-week during the study indicating stability of the test substance and the atmosphere generation techniques.

Overall target, nominal and achieved (per IR analysis) mean exposure concentrations are summarized below:

| Group | Test Substance | Atmosphere Concentration (mg/m$^3$) | | |
|---|---|---|---|---|
| | | Target | Nominal* | Achieved* |
| 1 | Air Control | 0 | 0 | 0 |
| 2 | Gasoline Isobutanol Vapor Condensate | 2,000 | 2,485 | 2,064 |
| 3 | Gasoline Isobutanol Vapor Condensate | 10,000 | 12,670 | 10,340 |
| 4 | Gasoline Isobutanol Vapor Condensate | 20,000 | 21,950 | 20,810 |

*Average of the 2 chambers used for each group.

By IR analysis, no Gasoline Isobutanol Vapor Condensate was detected in Group 1 samples. Mean atmosphere concentrations were on average for the 2 chambers used for each group 3.2%, 3.4% and 4.1% above target for Groups 2, 3 and 4, respectively.

The differences between the nominal and measured concentrations for Groups 2 and 3 may be attributed to the limited sensitivity of the balance used and small volume of test substance dispensed during each exposure.

Particle size analysis confirmed the absence of condensation aerosol in all groups during pretest evaluations and throughout the study.

All animals survived until the completion of exposures.

Hyaline droplet accumulation (minimal to moderate) was present in the kidneys of all male rats exposed to Gasoline Isobutanol Vapor Condensate at 20,000 mg/m$^3$. Alpha$_{2u}$-globulin nephropathy in rats is a known effect of exposure to unleaded gasoline. This finding is specific to male rats and is not considered relevant to human risk assessment. Exacerbation of spontaneous chronic progressive nephropathy is frequently reported with alpha$_{2u}$-globulin nephropathy. Alpha$_{2u}$-globulin nephropathy in male rats has also been associated with an increased incidence of renal tumors due to sustained proliferative effects secondary to overload-associated cellular loss. It is unnecessary to routinely use special histochemical stains for hyaline droplets to make the diagnosis of alpha$_{2u}$-globulin nephropathy. Special stains are most useful when there are unusual presentations, such as incidence in females or abnormal histologic features of the droplets, neither of which were present in this study.

Whole-body inhalation exposure of Gasoline Isobutanol Vapor Condensate at 2,000, 10,000 and 20,000 mg/m$^3$ was not associated with any other adverse effects on male or female rats.

Under the conditions of this study, the NOAEL (no observed adverse effect level) for Gasoline Isobutanol Vapor Condensate was considered to be 20,000 mg/m$^3$.

The NOAEL for study endpoints are summarized in the following table:

| Study Type [Laboratory] | Duration of Exposures | Basis for NOAEL | NOAEL |
|---|---|---|---|
| Inhalation Subchronic[a] [Envigo, East Millstone, NJ] | 13 weeks | Negative | 20,000 mg/m$^3$ |
| Neurobehavioral and Neuropathologic Effects [Envigo, Eye Suffolk, England] | 4 weeks | Negative | 20,000 mg/m$^3$ |
| Micronucleus [Envigo, Eye Suffolk, England] | 4 weeks | Negative | 20,000 mg/m$^3$ |
| Immunotoxicity [ImmunoTox Inc, Richmond, VA] | 4 weeks | Negative | 20,000 mg/m$^3$ |
| GFAP [Molecular Neurotoxicology Lab - NIOSH, Morgantown, VA] | 13 weeks | Negative | 20,000 mg/m$^3$ |

[a]Light Hydrocarbon Nephropathy observed in males at 20,000 mg/m$^3$ exposure level

# 1. Introduction

## 1.1 Objective

The purpose of this study was to assess the toxicity (including neurotoxicity, genotoxicity and immunotoxicity) of Gasoline Isobutanol Vapor Condensate (gasoline with a new oxygenate) when administered via inhalation to male and female rats for up to 13 weeks and to evaluate recovery during a 4-week exposure-free period.

## 1.2 Regulatory compliance

### 1.2.1 Test guidelines

This study was designed to meet or exceed the pertinent requirements of:

US EPA Vehicle Emissions Inhalation Exposure Guideline 79.61, CFR Vol. 59, No. 122, 27 June 1994.

US EPA Subchronic Toxicity Study with Specific Health Effect Assessments 79.62, CFR Vol. 59, No. 122, 27 June 1994.

US EPA OPPTS Health Effects Test Guidelines 870.3465, 90-Day Inhalation Toxicity, August 1998.

US EPA OPPTS Health Effects Test Guidelines 870.1350, Acute Inhalation Toxicity with Histopathology (respiratory tract histopathology sections, only), Public Draft June 1996.

US EPA OPPTS Health Effects Test Guidelines 870.6200, Neurotoxicity Screening Battery, August 1998.

US EPA Neuropathology Assessments 79.66, CFR Vol. 59, No. 122, 27 June 1994.

US EPA GFAP Assay 79.67, CFR Vol. 59, No. 122, 27 June 1994.

US EPA OPPTS Health Effects Test Guidelines 870.7800, Immunotoxicity, August 1998.

US EPA Micronucleus Assay 79.64, CFR Vol. 59, No. 122, 27 June 1994.

US EPA OPPTS Health Effects Test Guidelines 870.5395, Mammalian Erythrocyte Micronucleus Test, August 1998.

OECD Guideline for the Testing of Chemicals. (2014): Mammalian Erythrocyte Micronucleus Test, Test Guideline 474.

OECD: Neurotoxicity Study in Rodents, Testing of Chemicals Guideline No. 424. 21 July 1997.

EC Commission Regulation No. 440/2008. Method B.12: Mutagenicity - In vivo Mammalian Erythrocyte Micronucleus Test. OJ L 142/240.

### 1.2.2 Good laboratory practices

This study was conducted in compliance with the following Good Laboratory Practice standards:

United States Environmental Protection Agency's Good Laboratory Practice Standards 79.60, CFR Vol. 59, No. 122, 27 June 1994.

Statistical analysis, genotoxicity analysis and neurohistopathology and neuropathology performed by Envigo-UK were conducted in compliance with the following Good Laboratory Practice standards:

The UK Good Laboratory Practice Regulations (Statutory Instrument 1999 No. 3106, as amended by Statutory Instrument 2004 No.994)

EC Commission Directive 2004/10/EC of 11 February 2004 (Official Journal No L 50/44)

Organization for Economic Cooperation and Development (OECD) Principles of Good Laboratory Practices ENV/MC/CHEM/(98)17

With the exception of the following that were not considered to have impacted the validity or integrity of the study:

The GFAP analysis was not conducted in full compliance with the above referenced GLPs because the US Centers for Disease Control and Prevention Health Effects Laboratory Division – NIOSH laboratory is not a GLP laboratory. The GFAP analysis was conducted in the spirit of GLP and in accordance with the protocol and the Standard Operating Procedures.

Specimens obtained from mutagenicity tests and wet specimens of biological fluids need QA verification prior to disposal. However, samples were disposed of on 20 November 2015 without QA verification.

The expiry date for the test substance is not available.

Test substance analysis by Chevron Energy & Technology Company was done non-GLP.

### 1.2.3 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.

## 1.3 Test system

Pre-clinical studies in a rodent species are required by the US EPA to evaluate potential occupational and environmental exposure to humans. The rat is an animal model commonly utilized in toxicity studies as recommended in US EPA and OECD guidelines. In addition, a historical database is available for comparative evaluation.

## 1.4 Route, duration and frequency of administration

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 the minimum necessary for making occupational and environmental health risk assessments and as per US EPA and OECD guidelines.

## 1.5 Exposure level

The exposure levels were based on the lower explosive limit of the test substance such that the low and high exposure levels were ~5 and ~50% of the LEL. The high exposure level was considered the highest safe exposure level for laboratory use. Multiple gasoline products (including neat gasoline, gasoline with other oxygenates and this test substance) have been previously safely tested at this laboratory at these same exposure levels for up to 16 weeks of daily exposures without any clinical signs.

Neat isobutanol was previously tested with clinical signs of hypoactivity, diminished startle reflex and decreased motor activity in the range of exposure levels of 7,580 to 18,120 mg/m$^3$. The test substance, tested in this study, contained ~2 to 3% isobutanol, thus the high exposure level of ~20,000 mg/m$^3$ of test substance provided an exposure of ~400 to 600 mg/m$^3$ of isobutanol. Thus, similar clinical signs were not expected in this study that tested gasoline blended with isobutanol.

A two week inhalation range-finding toxicity study (Envigo 14-6484) with this test substance was conducted at exposure levels of 2,000 and 20,000 mg/m$^3$ without any clinical signs.

The positive control dose level of 20 mg/kg of cyclophosphamide for the genotoxicity evaluation was previously tested and found to be highly effective at generating chromosome damage and aneuploidy without clinical signs. The positive control dose level of 50 mg/kg of cyclophosphamide for the immunotoxicity evaluation was previously tested and found to be highly effective to suppress plaques, occurring from the lysis of sheep red blood cells, without clinical signs.

## 1.6 Number of animals

The number of animals in this protocol was considered the minimum necessary for statistical, regulatory and scientific reasons. The number of treatment groups and the number of animals per sex per treatment group for each set of animals were defined as per US EPA and OECD guidelines.

The purpose of this study was to monitor for general toxicity and reversibility of effects of the test substance. Historical control data indicate that clinical laboratory data, organ weight data and microscopic examination of tissues vary among individual animals. The number of animals (10/sex/group for Groups 1-4) was considered the minimum number that would account for the expected variability among animals. To determine reversibility of potential effects of the test substance, additional recovery animals (10 animals/sex/group in Groups 1 and 4) were included in the study.

The purpose of this study was also to monitor for neurotoxicity, genotoxicity and immunotoxicity of the test substance. Historical control data indicate that neurotoxicity, genotoxicity and immunotoxicity endpoints vary among individual animals. The number of animals/sex/group for Groups 1-4 (5/sex/group for neuropathology; 5/sex/group for GFAP; 5/sex/group for genotoxicity; 10 females/group for immunotoxicity since females were considered the more sensitive gender for the selected PFC evaluation) was considered the minimum number that would account for the expected variability among animals. Separate sets of animals were required for the various evaluations because the duration of exposures varied from 4 weeks to 13 weeks and/or terminal procedures for each evaluation would compromise the tissues or biological samples for the other evaluations.

Three test substance-treated groups receiving low, medium and high exposure levels and a negative air control group were considered the minimum number of groups necessary to provide a range of effects and allow for extrapolation of results to humans.

A separate positive control evaluation was required for the genotoxicity evaluation and this required 5/sex (the same n as for the Groups 1-4). A separate positive control evaluation was required for the immunotoxicity evaluation and this required 10 females (the same n as for the Groups 1-4).

## 1.7 Use of a restraint device

Animals were restrained (individual plastic box) during the IV dose administration procedure for the Immunotoxicity Study animals at four days prior to sacrifice. Dosing such rats requires they be placed in plastic boxes that restricted their movement (along with manual hold of the tail at the base by an assisting technician) for reliable injection into the tail vein. The animals were not habituated to the method of restraint because the duration of single restraint was brief.

# 2. Experimental Procedure

## 2.1 Study schedule and structure

### 2.1.1 Study dates

| | |
|---|---|
| Study initiation: | 3 February 2015 (Date Study Director signed the Protocol) |
| Animal receipt: | |
| Main/neuropath/GFAP study | 3 February 2015 (Experimental Start Date [OECD]) |
| Genotoxicity study | 12 February 2015 |
| Exposure initiation: | |
| Neuropath/GFAP study | 23 February 2015 (Experimental Start Date [EPA]) |
| Main study males | 24 February 2015 |
| Main study females | 25 February 2015 |
| Genotoxicity study | 27 February 2015 |
| Immunotoxicity: | |
| Animal receipt: | 19 March 2015 |
| Exposure initiation: | 2 April 2015 |
| Exposure termination: | 29 April 2015 |
| Terminal Necropsy: | 30 April 2015 |
| Exposure termination: | |
| Genotoxicity study | 26 March 2015 |
| Neuropath/GFAP study | 27 May 2015 |
| Main study males | 25 May 2015 |
| Main study females | 26 May 2015 |
| Terminal Necropsy: | |
| Genotoxicity study | 27 March 2015 |
| Neuropath/GFAP study | 28 May 2015 |
| Main study males | 26 May 2015 |
| Main study females | 27 May 2015 |
| Recovery Necropsy: | 24 June 2015 |
| Experimental completion date: | 22 March 2016 (Date of last data collection) |
| Study completion: | 25 March 2016 (Date Study Director signed the Final Report) |

### 2.1.2 Experimental outline

**Toxicity study and recovery study**

The test substance was administered by whole-body inhalation to rats for 6 hours per day for 5 days per week for 13 consecutive weeks (Toxicity Study animals and Recovery Study animals) followed by a 4-week recovery period (Recovery Study animals).

| Group | Treatment | Exposure Level ($mg/m^3$)[a] | Number of animals | | | |
|---|---|---|---|---|---|---|
| | | | Main study | | Recovery | |
| | | | Male | Female | Male | Female |
| 1 | Control | 0 | 10 | 10 | 10 | 10 |
| 2 | Gasoline Isobutanol Vapor Condensate | 2,000 | 10 | 10 | 0 | 0 |
| 3 | Gasoline Isobutanol Vapor Condensate | 10,000 | 10 | 10 | 0 | 0 |
| 4 | Gasoline Isobutanol Vapor Condensate | 20,000 | 10 | 10 | 10 | 10 |

[a]Exposure levels are expressed as $mg/m^3$ of test substance. The exposures were conducted via whole-body exposure. The Air Control Group 1 was operated under the same conditions as the Group 4 but with exposure to room air only. Otherwise, all exposure chambers were operated under the same conditions with the test substance concentration as the only variable.

**Satellite study**

The test substance was administered by whole-body inhalation to rats for 6 hours per day for 5 days per week for 13 consecutive weeks for the Neuropathology Study animals and for the GFAP Study animals. The test substance was administered by whole-body inhalation to rats for 6 hours per day for 5 days per week for 4 consecutive weeks for the Genotoxicity Study animals and for the Immunotoxicity Study animals.

| Group | Treatment | Exposure Level ($mg/m^3$)[a] or Dose (mg/kg) | Number of animals (Male/Female) | | | |
|---|---|---|---|---|---|---|
| | | | Neuro-pathology | Geno-toxicity | Immuno-toxicity | GFAP |
| 1 | Control | 0 | 5/5 | 5/5 | 0//10 | 5/5 |
| 2 | Gasoline Isobutanol Vapor Condensate | 2,000 | 5/5 | 5/5 | 0/10 | 5/5 |
| 3 | Gasoline Isobutanol Vapor Condensate | 10,000 | 5/5 | 5/5 | 0/10 | 5/5 |
| 4 | Gasoline Isobutanol Vapor Condensate | 20,000 | 5/5 | 5/5 | 0/10 | 5/5 |
| 5 | Cyclophosphamide | 20 mg/kg[b] | 0/0 | 5/5 | 0/0 | 0/0 |
| 6 | Cyclophosphamide | 50 mg/kg[b] | 0/0 | 0/0 | 0/10 | 0/0 |

[a]Exposure levels are expressed as $mg/m^3$ of test substance. The exposures were conducted via whole-body exposure. The Air Control Group 1 was operated under the same conditions as the Group 4 but with exposure to room air only. Otherwise, all exposure chambers were operated under the same conditions with the test substance concentration as the only variable.

[b]For Genotoxicity (MN) evaluations, positive control rats were given a dose of 20 mg/kg of Cyclophosphamide (CP) via oral gavage within 24 hours prior to sacrifice. For Immunotoxicity (PFC) evaluations, positive control rats were given a dose of 50 mg/kg CP via IP once per day for 4 days prior to sacrifice. These positive control animals were not chamber exposed prior to dosing and sacrifice.

## 2.2 Test substance and positive control substance

### 2.2.1 Test substance

Information supplied by the Sponsor regarding the test substance is contained in the study records.

The following information is given in summary:

| | |
|---|---|
| Test substance: | Gasoline Isobutanol Vapor Condensate |
| Test substance category: | Gasoline product |
| Supplier: | Chevron Energy & Technology Company<br>100 Chevron Way 51-2126<br>Richmond, California 94802 |
| Description: | Gas |
| Storage conditions: | Ambient |
| Lot numbers: | Batch 1 (run 1970)<br>Batch 2 (run 1972)<br>Batch 3 (run 1973)<br>Batch 5 (run 1975)<br>Batch 6 (run 1976<br>Batch 7 (run 1986)<br>Batch 9 (run 2022) |
| Expiration date: | Not available, stable per MSDS. |

Documentation of the identity, strength, purity, composition, stability, and method of synthesis, fabrication, and/or derivation of each batch of the test substance and the maintenance of these records were the responsibility of the Sponsor. There was ~2 to 3% of isobutanol in the vapor condensate. The Sponsor conducted a purity analysis of the test substance by GC at Envigo-UK (study number HUD0429) concurrent with this study.

A sample from each lot of test substance is stored in the Archives of the Testing Facility under conditions specified for test substance storage.

The unused portions of the test substance will be maintained by the Testing Facility for use on future studies. All empty test substance containers were returned to Chevron Energy Technology Company on an as-needed basis.

### 2.2.1 Positive control substance

Information supplied by the manufacturer regarding the positive control substance is contained in the study records.

The following information is given in summary:

| | |
|---|---|
| Positive control substance: | Cyclophosphamide |
| Supplier: | Sigma Chemical Company<br>3050 Spruce Street<br>Saint Louis, Missouri 63103 |
| Description: | White powder |
| Storage conditions: | Refrigerator (2 to 8 °C) |
| Lot number: | MKBS002IV |
| Expiration date: | 31 October 2017 |

Documentation of the identity, strength, purity, composition, stability, and method of synthesis, fabrication, and/or derivation of the positive control substance and the maintenance of these records were the responsibility of the Manufacturer.

An archival sample of the positive control substance was not taken for this study.

The unused portion of the positive control substance is maintained by the Testing Facility for use on future studies.

### 2.2.2 Preparation and analysis of test and positive control substances

**Test substance**

Gasoline Isobutanol Vapor Condensate was used as supplied by the Sponsor.

**Positive control substance**

The positive control substance was mixed (2.0 mg/mL) with distilled water [lot number: DDW0045, expiration date: 3 February 2017]) for genotoxicity evaluations. The formulation was prepared once and kept at room temperature. Tap water supplied by New Jersey-American Water Company, Cherry Hill, New Jersey, was distilled at the Testing Facility and stored at room temperature

The positive control substance was mixed (5.0 mg/mL) with phosphate buffered saline and sterile filtered for IP dosing for immunotoxicity evaluations. The phosphate buffered saline was prepared once with phosphate buffered saline powder, pH 7.4, lot number: SLBL3211V, supplier: Sigma, Allentown, Pennsylvania and sterile water for injection, lot number: B1410091,

supplier: Henry Schein Animal Health, Elizabethtown, Pennsylvania. The formulations were prepared daily and kept at room temperature.

Detailed records of test and positive control substance usage were maintained. The amount of each substance needed and the amount actually used were determined daily.

**Analysis**

Analytical results for each lot of the test substance were provided by Chevron Energy & Technology Company as is presented in Annex 1.

Analyses to determine the stability, uniformity or concentration of the positive control substance mixtures were not performed.

## 2.3 Test substance administration

| | |
|---|---|
| Route | Inhalation – whole body. |
| Controls (Group 1) | Air only. |
| Duration of daily exposure | 6 hours. |

Food and water were not available during the exposures. Details of exposures and analysis of the test atmospheres together with the results obtained are presented in Annex 2 and Annex 3.

## 2.4 Animal management

### 2.4.1 Animals, allocation and identification

**Animals**

| | | | |
|---|---|---|---|
| Strain/Species | Albino Rats (Outbred) VAF/Plus®<br>CD® (Sprague-Dawley derived) [Crl:CD(SD) CD® IGS] | | |
| Supplier | Charles River Laboratories<br>Kingston, New York 12484 | | |
| Number of animals | | Received | Placed on test |
| | Total: | 316 | 300 |
| | Males: | 131 | 125 |
| | Females: | 185 | 175 |
| Pretest period | The pretest period was up to 3 weeks. All animals were examined during the pretest period to confirm suitability for study. Pretest procedures were not performed until animals had been allowed to stabilize for 1 week. | | |

| | | |
|---|---|---|
| Age of the animals at start of treatment | 6 to 7 weeks | |
| Weight range of the main study animals at the start of treatment | Males: | 165 g to 254 g |
| | Females: | 147 g to 193 g |

### Allocation and identification

| | |
|---|---|
| Allocation | More animals than required for the study were purchased, stabilized and randomly allocated on arrival. Using the sequence of cages in the battery, one animal at a time was placed in each cage with the procedure being repeated until each cage held the appropriate number of animals. Each sex was allocated separately. Individual weights of animals placed on test were within ±20% of the mean weight for each sex. Information as to the disposition of all animals not utilized in the study is maintained in the study file. |
| Identification of animals | Each GFAP and neuropathology study animal was implanted with a BMDS IMI-1000 Implantable Radio Frequency Transponder (microchip) programmed with a unique number. If the transponder was lost or could not be scanned, it was replaced. The remaining study animals were identified with a tail tattoo bearing its assigned animal number. This number was cross referenced with an animal number assigned by the Testing Facility; this number plus the study number comprised a unique identification number for each animal.<br><br>In addition, each cage was provided with a cage card that was color-coded for dose level identification and contained study number and facility-assigned animal number information. |
| Veterinary care | Animals were monitored by the technical staff for any conditions requiring possible veterinary care. |

## 2.4.2 Husbandry

### 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 Academies Press, 2011. Envigo, East Millstone, New Jersey is fully accredited by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC).

## Environmental control

| | |
|---|---|
| Light/dark cycle | A twelve hour light/dark cycle was provided and controlled via an automatic timer.<br><br>Note: Light cycles were interrupted for toxicokinetic collection as required. |
| Temperature and relative humidity | Monitored and maintained within the range of 18 to 26 °C and 30 to 70%.<br><br>There were no deviations from these ranges. |

## Animal housing and environmental enrichment

| | |
|---|---|
| Cages | Polycarbonate cages with a stainless steel mesh lid. |
| Number of animals per cage | Nominally 2 or 3 of the same sex per cage. |
| Bedding | Cellulose-based contact bedding (7070C Teklad Diamond Dry, Envigo, Madison, Wisconsin) which was changed at appropriate intervals each week.<br><br>Analytical results of the bedding, provided by the manufacturer, are maintained on file at the Testing Facility. There were no known contaminants in the bedding that were expected to interfere with the objectives of this study. |
| Environmental enrichment | Provided to each cage throughout the study and replaced when necessary. |

## Feed

| | |
|---|---|
| Diet | Certified Global 16% Protein Rodent Diet 2016C (Pellets) Envigo, Madison, Wisconsin. |
| Availability | Without restriction (removed overnight before blood sampling for clinical pathology). Fresh feed was presented weekly. |
| Analysis | Analysis of each feed lot used during this study was performed by the manufacturer. Results were provided to the Testing Facility and are maintained on file at the Testing Facility. There were no known contaminants in the feed that were expected to interfere with the results of this study. |

**Water**

| | |
|---|---|
| Supply | Potable water from the public supply (New Jersey-American Water Company, Cherry Hill, New Jersey) via an automated watering system. |
| Availability | Without restriction. |
| Analysis | Water analyses are conducted by New Jersey-American Water Company, Cherry Hill, 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 which were expected to interfere with the results of this study. |

## 2.5 Experimental evaluations

Serial observations performed on the animals from the satellite studies (Neuropathology, Genotoxicity, Immunotoxicity and GFAP Studies) were confined to clinical observations, ophthalmology, body weights and food consumption; these data are not reported. However, neurobehavioral assessments (functional observational battery and motor activity examinations) were performed on animals designated for GFAP and neuropathology and the data are reported.

### 2.5.1 Daily observations

Animals were observed in their cages twice daily for mortality and general condition. During the treatment period, all animals were observed for signs of toxic or pharmacologic effects twice daily.

During each inhalation exposure, animals were observed continuously with observations recorded as a group once per exposure day.

### 2.5.2 Signs

Animals were removed from their cages and examined once pretest and weekly during the study period. Examinations included observations of general condition, skin and fur, eyes, nose, oral cavity, abdomen and external genitalia as well as evaluations of respiration.

### 2.5.3 Ophthalmoscopic examination

All animals were examined pretest and Week 13 (except Genotoxicity study and Immunotoxicity study animals).

Lids, lacrimal apparatus and conjunctiva were examined visually. The cornea, anterior chamber, lens, iris, vitreous humor, retina and optic disc were examined by indirect ophthalmoscopy.

The pupils of each animal were dilated prior to examination using tropicamide ophthalmic solution.

### 2.5.4 Body weight

Animals were removed from their cages and weighed once pretest, weekly during the study period and terminally (after fasting). Terminal, fasted body weights were obtained just prior to necropsy.

### 2.5.5 Food consumption

Food consumption was measured (weighed) for all study animals (except for Genotoxicity study and Immunotoxicity study animals) during the week prior to initiation of exposures and weekly throughout the study.

### 2.5.6 Neurobehavioral studies

Neurobehavioral evaluations were performed on the Neuropathology Study and the GFAP Study animals (10/sex/group) at pretest and Weeks 4, 8 and 13 at least 16 hours post-exposure on non-exposure days during the exposure period. Testing at each interval was staggered over several sessions with approximately equal numbers of animals per sex per dose group in each session. Noise level in the functional observational battery room was maintained within a level of 55 to 65 decibels by a white noise generator. Temperature, humidity, noise level and illumination of each room were measured and recorded to ensure that variations in environmental conditions were minimal during all evaluations.

### Functional observational battery

A functional observational battery (Moser, 1989) was performed on all animals. With the exception of pretest, evaluations were performed "blind", i.e., the observer did not know the identity of the animal's dose group. Time of testing was counter-balanced across treatment groups.

Evaluations were performed according to the Testing Facility's Standard Operating Procedures that include defined scales as listed below. Behaviors not adequately described by the defined scales were further characterized by descriptive comments. Testing proceeded from the least to the most interactive with the subject.

**Home cage evaluations**

Posture (Post)

1 Sitting or standing
2 Rearing; standing on hind limbs
3 Asleep; may be lying on side or curled up
4 Lying on side, limbs in the air

5 Flattened; limbs may be spread
6 Crouched; sitting hunched, head hung down

Palpebral Closure (Palp Close)
1 Eyelids open
2 Eyelids slightly drooping
3 Eyelids half closed
4 Eyelids completely closed

Vocalizations (Vocal)
1 No vocalizations present
2 Vocalization present

Motor Movements (Motor)
1 No abnormal movements
2 Tremors
3 Fasciculations
4 Convulsions
5 Stereotypy (compulsive movements, e.g. sniffing, licking, grooming)
6 Other (descriptive comment made)

**Handling evaluations**

Ease of Removal (Rem)
1 Very easy; sits quietly, accepts observer's touch
2 Easy; vocalization without resistance to handling
3 Slightly difficult; rears, often follows observer's hand
4 Freezes or flinches; with or without vocalization
5 Moderately difficult; runs around cage, is hard to pick up
6 Very difficult; attempts to bite and attack, with or without vocalization

Reactivity to Handling (Hand)
1 Low; no resistance, rat is easy to handle
2 Moderately low; slight resistance to being handled with or without vocalization
3 Moderately high; freezes, tense or rigid in hand with or without vocalization
4 High; squirms or twists, attempts to bite, with or without vocalization

Chromodacryorrhea (Chromo)
1 Not present
2 Present

Lacrimation (Lac)
1 No lacrimation
2 Moderate lacrimation
3 Extreme lacrimation

Salivation (Sal)
1 Not present
2 Slight salivation; around mouth
3 Moderate salivation; facial and/or cervical area
4 Extreme salivation; on ventral surface

Coat
1 Normal; well-groomed
2 Slightly soiled
3 Moderately soiled
4 Extremely soiled; crusty, unkempt

**Open field evaluations**

Gait and Posture (Gait)
1 No abnormal gait or posture observed
2 Ataxia
- *1 slightly uncoordinated limb movement, may be seen intermittently*
- *2 moderately uncoordinated, body rocks or sways, limbs uncoordinated*
- *3 severely uncoordinated, animal has difficulty remaining upright during movement*

3 Hind limbs are splayed or drag
- *1 slight, hind limbs slightly splayed, may be seen intermittently*
- *2 moderate, pronounced foot splay, present continuously*
- *3 severe, hind limbs are dragging*

4 Forelimbs drag
- *1 moderate, intermittently drags forelimbs*
- *2 severe, forelimbs drags, unable to support body*

5 Walks on tip toes
- *1 slight, observed intermittently*
- *2 severe, continuous, body arched*

6 Hunched or crouched body position
- *1 moderate, hunched or crouched position, displays some movement*
- *2 severe, continual hunched or crouched position, no movement*

7 Body drags or is flattened
- *1 slight, body is low to the surface, but supported by all limbs*
- *2 moderate, body is touching surface, but supported by limbs*
- *3 severe, body is flattened with all limbs extended*

Locomotion (Loco)
1 No impairment; moves easily around open field
2 Slightly impaired; moves slowly, deliberate movement
3 Moderately impaired; moves sluggishly and with hesitation, may require gentle prodding
4 Severely impaired; does not move around field, even after gentle prodding

Arousal (Arous)
1 Very low; stupor, little or no responsiveness to environment
2 Moderately low; slight stupor, some head or body movement

3 Slightly low and sluggish; some exploratory behavior with periods of inactivity
4 Alert; displays exploratory behavior
5 High; slight excitement, tense, sudden darting or freezing
6 Very high; hyperalert, sudden bouts or running or movement

Piloerection (Pilo)
1 Not present
2 Present

Exophthalmia (Exo)
1 Not present
2 Present

Urine Number of pools of urine or "X" if polyuria is noted.

Fecal Pellets (Feces) Number of fecal pellets or "U" if unformed stool is noted.

**Motor movements**

Fasciculations (Fasc)
1 Not present
2 Present

Tremors (Trem)
1 Not present
2 Present

Convulsions (Conv)
1 Not present
2 Present

**Reflex assessments**

Visual Approach (Visual Appr)
1 No reaction
2 Slowly approaches, sniffs and/or turns away
3 Freezes or pulls away slightly
4 Jumps or turns abruptly to avoid
5 Attacks and/or bites

Audition Assessment (Aud)
1 No reaction
2 Slight reaction, some evidence that noise was heard
3 Flinches and/or flicks ears
4 Exaggerated; jumps, flips, bites

Pinna Reflex (Pinna)
1 Ear flattens against head or shakes head
2 No response

Proprioception (Proprio)
1 Returns leg to original position
2 Returns leg only partially to original position
3 No response; allows leg to remain pulled back

Pain Perception (Pain)
1 No reaction
2 Turns toward site, walks forward, or vocalizes with little or no movement
3 Rat flinches, muscle contractions present
4 Exaggerated; jumps, bites, attacks

Pupil Response (Pupil Resp)
1 Pupil constricts normally, pupil size not abnormal
2 Pupil size does not change
3 Miosis (right, left or bilateral indicated)
4 Mydriasis (right, left or bilateral indicated)

Air Righting (Air Right)
1 Normal; lands on four feet
2 Slightly uncoordinated; two-legged or unsteady landing
3 Lands on side
4 Lands on back

**Other**

Grip Strength
Forelimb and hind limb grip strength measured in grams (Meyer *et al*., 1979).

Landing Foot Splay
Hind limb landing foot splay measured in centimeters (cm). Measurements taken from the approximate middle of each footprint.

Body Temperature (Body Temp)
Rectal temperature measured in degrees centigrade (°C)

## Motor activity

The locomotor activity of the Neuropathology Study and the GFAP Study animals (10/sex/group) at pretest and Weeks 4, 8 and 13 at least 16 hours post-exposure on non-exposure days during the exposure period was monitored using a modified version of Schulze's procedures (Schulze, 1990). Sessions were 60 minutes in length; each session was divided into 12 5-minute intervals. Motor activity for each animal was individually started at the end of its FOB assessment. The time of testing was balanced across treatment groups.

### 2.5.7 Clinical pathology

Blood was obtained and used to analyze hematology and clinical chemistry parameters after 4 weeks of exposures (Week 5) and after the end of the exposure period. Blood was obtained and used to analyze coagulation parameters after the end of the exposure period only. Samples were collected via the jugular vein from 10 unanesthetized animals/sex/group after 4 weeks of exposures (Week 5). After the end of the exposure period, blood samples were collected from the vena cava while under isoflurane anesthesia from 10 animals/sex/group at necropsy. This was performed as a terminal procedure (animals were not allowed to recover from anesthesia after blood collection). Animals were fasted overnight prior to each blood collection interval.

#### Hematology

Blood samples (approximately 0.25 mL) were collected into tubes containing $K_2$EDTA anticoagulant and analyzed for the following using a Siemens ADVIA 120 Hematology Analyzer:

Hemoglobin concentration (HGB)
Hematocrit (HCT)
Erythrocyte count (RBC)
Platelet count (PLT)
Mean corpuscular volume (MCV)
Mean corpuscular hemoglobin (MCH)
Mean corpuscular hemoglobin concentration (MCHC)
Red cell distribution width (RDW)
Total leukocyte count (WBC)
Reticulocyte count (RETIC)
Differential leukocyte count[1]
- Neutrophils (ANEU)
- Lymphocytes (ALYM)
- Eosinophils (AEOS)
- Basophils (ABASO)
- Monocytes (AMONO)
- Large unstained cells (ALUC)

A peripheral blood smear was prepared for each animal at each blood collection interval and was available for confirmation of automated results and/or other evaluations deemed necessary by the Clinical Pathologist.

[1]Manual differential leukocyte counts were performed for verification and absolute values were calculated if necessary.

### Coagulation

Blood samples (approximately 1.0 mL) were collected into tubes containing sodium citrate anticoagulant and analyzed for the following using a Diagnostica Stago Products STA Compact® mechanical clot detection system:

Prothrombin time (PT)
Activated partial thromboplastin time (APTT)

### Clinical chemistry

Blood samples (approximately 1.0 mL) were collected into tubes with no anticoagulant, allowed to clot, centrifuged to obtain serum and analyzed for the following using a Siemens ADVIA 1800 Chemistry Analyzer:

Aspartate aminotransferase (AST) (*Kinetic – Modified Bergmeyer*)
Alanine aminotransferase (ALT) (*Kinetic – Modified Bergmeyer*)
Alkaline phosphatase (ALKP) (*Kinetic – Tietz AMP Buffer*)
Blood urea nitrogen (BUN) (*Enzymatic – Roch-Ramek with Urease*)
Creatinine (CREAT) (*Jaffe Picric Acid in Alkaline Medium*)
Glucose (GLU) (*Glucose Hexokinase II Method*)
Cholesterol (CHOL) (*Enzymatic esterase/oxidase – Trinder Endpoint*)
Triglycerides (TRIG) (*Fossati Three Step Enzymatic – Trinder Endpoint*)
Total protein (TP) (*Biuret Technique*)
Albumin (ALB) (*Bromocresol Green Method*)
Total bilirubin (TBILI) (*Oxidation with Vandate*)
Sodium ($NA^{+}$) (*Ion Selective Electrode*)
Potassium ($K^{+}$) (*Ion Selective Electrode*)
Chloride ($Cl^{-}$) (*Ion Selective Electrode*)
Calcium ($Ca^{++}$) (*Michaylova & Ilkova, Arsenazo III*)
Inorganic phosphorus (PHOS) (*Phosphomolybdate – UV Method*)

## 2.6 Genotoxicity (micronucleus) evaluations

Genotoxicity Study animals (5/sex/group for Groups 1-4) were exposed to the test substance via inhalation for a 4 week (6 hours/day, 5 days per week) exposure period. Animals in Group 5 were dosed once by oral gavage (using a flexible rubber catheter and a syringe of appropriate size) with the positive control substance formulations (cyclophosphamide in distilled water) within 24 hours prior to sacrifice. Doses were calculated using the most recent body weights available.

The animals were euthanized by isoflurane inhalation followed by exsanguination. The left femur was removed, bone marrow harvested and smears were prepared and subsequently fixed in methanol. Following preparation of the bone marrow smears, the carcass was discarded without further evaluation. The fixed, unstained slides were shipped (6 per animal – 4 for shipment and 2 for retention) for genotoxicity evaluations to Envigo-UK.

The methodology of smear staining, microscopic examination and analysis of the data are discussed in Annex 7.

## 2.7 Immunotoxicity (PFC) evaluations

Immunotoxicity Study female animals (10/group for Groups 1-4) were exposed to the test substance via inhalation for a 4 week (6 hours/day, 5 days/week) exposure period. Animals in Group 6 were dosed by intraperitoneal injection with the positive control substance formulations (cyclophosphamide in phosphate buffered saline), once daily for 4 days prior to sacrifice. Four days prior to sacrifice, animals were immunized with sheep red blood cells ($2 \times 10^8$) via tail vein injection while restrained in a tube.

The sRBCs was prepared at 4 x 10^8 sRBCs/mL in Alsever's at ImmunoTox. On the day of immunization at Envigo the sRBCs were centrifuged (2-8ºC; 2200 ± 100 rpm =1150 G), re-suspended in EBSS with HEPES and kept on wet ice until dosed. The animals were given the immunization by tail vein injection while restrained in a plastic box. Prior to IV dosing, the sRBCs were transferred to the animal room and the animals were warmed for generally 15 to 20 minutes in empty shoebox cages with wire lids on top. The animal cage floors were warmed by heating pads placed under the cages. The warming of the animals was staggered to avoid overheating; the heat was assessed by touch prior to placing the animal in the cage and the animals were continuously monitored for any signs of distress. The immunization injections were performed by trained and qualified personnel from ImmunoTox, a division of AIBioTech. The technician used a 1 mL tuberculin syringe with a 23 gauge/1" needle to administer the sheep red blood cells (sRBCs). A volume of 0.5 mL of sRBCs was injected into each rat.

On the day after the final test substance exposure (Groups 1-4) or the final positive control dosing (Group 6), the animals were euthanized by isoflurane inhalation followed by exsanguination, the spleens were aseptically removed (using procedures provided by ImmunoTox, a division of AIBioTech), weighed and shipped intact in HEPES/EBSS/Gentamicin solution in individual shipping containers on wet ice (2-8°C) for determination of PFC response to ImmunoTox, a division of AIBioTech, Richmond, Virginia. After removal of the spleen, the thymus was removed, weighed, and preserved (10% neutral buffered formalin) for possible histopathology.

Processing of the spleen, analytical methodology and analytical results are presented in Annex 8.

## 2.8 Postmortem

### 2.8.1 Method of euthanasia

Animals sacrificed at the scheduled toxicity, genotoxicity, immunotoxicity and GFAP sacrifice intervals were euthanized by exsanguination following isoflurane inhalation. Exsanguination for animals designated for toxicity, genotoxicity and GFAP was performed according to the Testing Facility SOP. Exsanguination for animals designated for immunotoxicity was performed by transecting the femoral artery and femoral vein on both legs.

Animals sacrificed at the scheduled neuropathology sacrifice interval were anesthetized with an IP injection of sodium pentobarbital (~98 mg/kg dose by using a 39% solution at 0.25 mL/kg dose volume) and transcardially perfused with heparinized phosphate buffered saline followed by 1% glutaraldehyde and 4% paraformaldehyde in the same buffer.

### 2.8.2 Toxicity study

#### Scheduled necropsy

Necropsy was performed on 10 animals/sex/group after animals had been treated for 13 weeks and on 10 animals/sex/group in Groups 1 and 4 after a 4-week treatment-free recovery period. Animals were fasted overnight prior to necropsy. Necropsy schedules were established to ensure 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 periods.

#### Macroscopic examinations

Complete macroscopic examinations were performed on all animals. The macroscopic examination included examination of the external surface and all orifices; the external surfaces of the brain and spinal cord; the organs and tissues of the cranial, thoracic, abdominal and pelvic cavities and neck; and the remainder of the carcass for the presence of macroscopic morphologic abnormalities.

#### Organ weights

Organs indicated in Text Table 2.8.2-1 were weighed for all animals at the scheduled sacrifice intervals. 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.

#### Tissues preserved and examined histopathologically

The tissues listed in Text Table 2.8.2-1 were obtained from all animals and preserved. In addition, slides of the indicated tissues were prepared and examined microscopically. Any abnormalities not noted during macroscopic examinations which were seen during histology processing were recorded.

**Text Table 2.8.2-1: Tissues weighed, preserved and examined microscopically**

| TISSUE | WEIGHED | PRESERVED | EXAMINED MICROSCOPICALLY (Groups 1 and 4 at Terminal Necropsy) |
|---|---|---|---|
| animal identity | | X | |
| adrenals | X | X | X |
| aorta (thoracic) | | X | X |
| bone marrow smear (femur) | | X | |
| bone (femur including joint) | | X | X |
| bone (sternum) | | X | X |
| bone marrow (femoral) | | X | X[a] |
| bone marrow (sternal) | | X | X[a] |
| brain | X | X | X |
| cecum | | X | X |
| colon | | X | X |
| duodenum | | X | X |
| epididymides | X | X | X |
| esophagus | | X | X |
| eyes | | X | X |
| Harderian glands | | X | X |
| heart | X | X | X |
| ileum | | X | X |
| jejunum | | X | X |
| kidneys | X | X | X |
| lacrimal glands | | X | X |
| larynx | | X | X |
| liver | X | X | X |
| lungs and bronchi | X | X | X |
| lymph node (axillary) | | X | X |
| lymph node (mesenteric) | | X | X |
| lymph node (tracheobronchial) | | X | X |
| mammary gland | | X | X[b] |
| naso-pharynx/pharynx | | X | X |
| nerve, optic | | X | |
| nerve, sciatic | | X | X |
| nose/turbinates | | X | X |
| ovaries | X | X | X |
| pancreas | | X | X |
| Peyer's patches\GALT | | X | X[b] |
| pituitary | X[c] | X | X |

| TISSUE | WEIGHED | PRESERVED | EXAMINED MICROSCOPICALLY (Groups 1 and 4 at Terminal Necropsy) |
|---|---|---|---|
| prostate | X[d] | X | X |
| rectum | | X | |
| salivary glands (mandibular) | | X | X |
| seminal vesicles | X[d] | X | X |
| skeletal muscle (*rectus femoris*) | | X | X |
| skin and subcutis (dorsal – base of tail) | | X | X |
| spinal cord (cervical) | | X | X |
| spinal cord (thoracic) | | X | X |
| spinal cord (lumbar) | | X | X |
| spleen | X | X | X |
| stomach | | X | X |
| testes | X | X | X |
| thymus | X | X | X |
| thyroid (with parathyroid) | X[c] | X | X |
| tongue | | X | |
| trachea including tracheal bifurcation w/carina | | X | X |
| urinary bladder | | X | X |
| uterus and cervix | X | X | X |
| vagina | | X | X |
| Zymbal's gland | | X | |
| gross lesions | | X | X |
| target organs[g] | | X | X |

[a]Qualitative examination (no differential count).
[b]Mammary gland for males and GALT were evaluated only if present in routine sections.
[c]Weighed post-fixation.
[d]Prostate and seminal vesicles were weighed together.

## Preservatives

All tissues were preserved in 10% neutral buffered formalin (NBF). The eyes and testes were placed in Modified Davidson's solution initially and then retained in 10% NBF. Lungs were infused with 10% NBF prior to their immersion into a larger volume of the same fixative.

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

## Processing

After fixation, the tissues and organs from all animals were routinely processed, embedded in paraffin, cut at a microtome setting of approximately 5 microns, mounted on glass slides, stained

with hematoxylin and eosin and examined by light microscopy. The bones were decalcified in Decalcifier II™.

### 2.8.3 Neuropathology evaluations

#### Scheduled sacrifice

Animals designated for neuropathology evaluations (5/sex/group for Groups 1-4) were anesthetized and transcardially perfused with heparinized phosphate buffered saline followed by 1% glutaraldehyde and 4% paraformaldehyde in the same buffer. After the perfusion (by gravity), the entire carcass was shipped in fixative (1% glutaraldehyde and 4% paraformaldehyde in heparinized phosphate buffered saline) to Envigo-UK for histology processing and microscopic examination. Measurement of the size (length x width) and weight of the whole brain (cerebrum, cerebellum and pons-medulla) were recorded. The tissues listed in Text Table 2.8.3-1 were obtained from the designated animals and preserved.

**Text Table 2.8.3-1: Tissues preserved and examined microscopically**

| TISSUE | PRESERVED | MICROSCOPIC EXAMINATION (Groups) | |
|---|---|---|---|
| | | 1 and 4 | 2 and 3 |
| brain (forebrain, central cerebrum, hippocampus, basal ganglia, midbrain, cerebellum and pons, medulla) | X | X | |
| eye with optic nerve | X | X | |
| spinal cord (cervical, thoracic, lumbar, cross and longitudinal sections) | X | X | |
| sciatic nerve (cross and longitudinal sections) | X | X | |
| tibial nerve (cross and longitudinal sections) | X | X | |
| sural nerve (cross and longitudinal sections) | X | X | |
| trigeminal ganglia | X | X | |
| dorsal root ganglia (from $C_3$-$C_6$ and $L_1$-$L_4$) | X | X | |
| dorsal root fibers (from $C_3$-$C_6$ and $L_1$-$L_4$) | X | X | |
| ventral root fibers (from $C_3$-$C_6$ and $L_1$-$L_4$) | X | X | |
| lungs and trachea | X | X | X |
| tissues with macroscopic findings | X | X | X |

Peripheral nerves were post-fixed in 1% osmium tetroxide, processed and embedded in epoxy resin and microtomed at approximately 2 microns and stained with toluidine blue. All other tissues, including the brain, eye with optic nerve, spinal cord, trigeminal ganglia, dorsal root ganglia, dorsal and ventral root fibers, lungs and trachea were processed by standard techniques, embedded in paraffin and microtomed at approximately 6 microns, stained with hematoxylin and eosin and examined microscopically for all animals.

A report by the Neuropathologist is presented in Annex 10.

### 2.8.4 GFAP evaluations

Animals designated for GFAP evaluations (5/sex/group for Groups 1-4) were euthanized and the brain was removed and weighed. The brain was transported on dry ice to the US Center for Disease Control Health Effects Laboratory for further processing for determination of GFAP response. GFAP response is considered a biomarker for toxicant induced injury of the central nervous system as a result of hypertrophy of astrocytes at the site of injury.

Methodology of further processing and evaluation of the brain is discussed in Annex 9.

## 2.9 Computer systems

The computer systems with version numbers that were used on this study to acquire and quantify data include:

| System | Version | Use |
|---|---|---|
| AmegaView Environmental Monitoring System | 3 | Monitoring of environmental conditions within the pharmacy |
| ClinAxys II | 2.6.3 | Acquisition, processing and reporting of clinical pathology data from a variety of instruments |
| Liberate Reporting System | 2.2 | Generation of report tables in MS Word formats for data collected using ClinAxys II |
| Liberate Reporting System – Global | 1 | Generation of report tables in MS Word formats for data collected using the Xybion Pristima® System |
| Microsoft Word and/or Excel | | Additional formatting of report tables. |
| Kinder Scientific MotorMonitor | 6.00 | Measurement of locomotor activity in small animals |
| Quasar | 1.4 | Statistical analysis of data |
| REES Scientific Environmental Monitoring System | WIN 1.5 | Monitor and record temperature, humidity and/or light intensity readings of applicable rooms as well as the temperature readings of applicable refrigerators and/or freezers |
| TSI Aerodynamic Particle Sizer Spectrometer | 2.9 | Acquisition of particle size data |
| TotalChrom | 6.2.1 | Acquisition and processing of chromatographic data from HPLC |
| Xybion Pristima® System | 7 | Documentation of receipt and tracking of substances received by Pharmacy and direct online capture of in-life and postmortem evaluations |

## 2.10 Data treatment

Serial observations performed on the animals from the satellite studies (Neuropathology, Genotoxicity, Immunotoxicity and GFAP Studies) were confined to clinical observations, ophthalmology, body weights and food consumption; these data are not reported. However, neurobehavioral assessments (functional observational battery and motor activity examinations) were performed on animals designated for GFAP and neuropathology and the data is reported.

Individual animal data presented in this report may be rounded. Unrounded individual animal data were 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.

Group means and standard deviations for calculated data points (i.e. body weight change) were derived from individual animal/cage values.

The data collection system used for collecting the in-life and post-life data divides the study into phases. The start of each phase begins with Day 1/Week 1. The phases presented in this report are:

| | |
|---|---|
| Pre-Treatment: | Begins the day the animals arrive. Phase days/weeks are labeled P1, P2, P3, etc. During this phase, animals are not being dosed and they have not been assigned their permanent identification numbers. |
| Randomization: | Begins the day the animals are sorted into groups and assigned their permanent identification numbers. Phase days/weeks are labeled Ra1, Ra2, Ra3, etc. Animals are not being dosed during this phase. |
| Treatment: | Begins for each animal when it receives its first administration of test/control substance as specified in the protocol. |
| Recovery: | Begins the day after each designated animal stops receiving its specified dose and continues until study completion. Phase days/weeks are labeled R1, R2, R3, etc. |

The following abbreviations are used in this report:

| | |
|---|---|
| hr(s) | hour(s) |
| min(s) | minute(s) |
| M | Male(s) |
| F | Female(s) |
| ~ | approximately |
| $mg/m^3$ | milligram test substance per cubic meter of air |
| mg/kg | milligrams of test substance per kilogram of body weight |

| | |
|---|---|
| LEL | lower exposure limit |
| PFC | perfluorinated compound |
| MN | microneucleous |
| IV | intravenous |
| IP | intraperitoneal |
| IR | infra-red spectroscopy |
| sRBC | immunization using sheep erythrocyte |
| EBSS | Earle's Balanced Salt Solution |
| HEPES | 4-(2-hydroxyethyl)-1-piperazineethanesulfonic acid |
| GALT | Gut-associated lymphoid tissue |

The death codes used have the following meanings:

S1 Scheduled Euthanasia 1
Z1 Recovery Euthanasia 1

### 2.10.1 Serial observations

#### Clinical observations

Clinical observations are presented for each animal that showed signs, providing detail of the type of sign, day or week of occurrence and information on the duration of the sign applicable.

AM Morning (Pre-dose) Observation
PM Afternoon Observation

For summarization purposes, descriptive comments [i.e., location of scab(s) and sore(s), etc.] are not presented in the summary tables; they are presented in the individual animal data appendices.

#### Ophthalmic examination

Observations are presented for each animal that showed findings. Observations were bilateral unless otherwise indicated.

#### Food consumption

Food consumption (g/animal/day) was calculated as:

*grams of food consumed ÷ animal days*[a]

[a]*Sum of whole days each animal is alive in the cage for each consumption period. If an animal dies the day of death is not counted as an animal day. For example: 4 animals in a cage for 5 days equals 20 animal days; if one animal died on the 3rd day then the animal days equals 17.*

### Hematology

The following abbreviation was used:

| | |
|---|---|
| CS | Clotted specimen |

Sample comments (SCM1) were described using the following abbreviations:

| | |
|---|---|
| CLSE | Severe platelet clumping noted |
| CLSL | Slight platelet clumping noted |
| NCLP | No clumping |

### Coagulation

The following abbreviation was used:

| | |
|---|---|
| CS | Clotted specimen |

### Blood chemistry

TBILI values below the analytical limit (<0.2) are excluded from calculations.

Globulin (GLOB) was calculated as:

*total protein – albumin*

Albumin/globulin ratio (A/G) was calculated as:

*albumin ÷ globulin*

Sample conditions (SCD1) were described using the following abbreviations:

| | |
|---|---|
| SLH | Slightly hemolyzed |

## 2.10.2 Terminal procedures

### Organ weights

Organ weights were presented as absolute, relative to terminal body weight using the weight recorded on the day of necropsy and relative to brain weight.

### Pathology

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

Histopathology findings were graded according to the following scale:

| | |
|---|---|
| Minimal | The change is barely discernible and/or very few/very small foci or areas are affected. |
| Slight | The change is more noticeable but only evident as few/small foci or areas affected. |
| Moderate | The change is obviously present, and of appreciable size and/or number. |
| Marked | The change is abundant in many areas of the section and/or is of prominent size. |
| Severe | The change affects a large proportion of the tissue and/or is of a large size. |

### 2.10.3 Statistical analysis

All statistical analyses were carried out separately for males and females. Data relating to food consumption were analyzed on a cage basis. For all other parameters, the analyses were carried out using the individual animal as the basic experimental unit.

Discussion of the methodology and results of statistical analysis of the motor activity data are presented in Annex 11.

The following data types were analyzed at each timepoint separately:

body weight
body weight change from interval to interval
cumulative body weight change from baseline
food consumption
hematology
coagulation
clinical chemistry
organ weights
motor activity counts (performed by Envigo-UK)
forelimb and hind limb grip strength measurements
landing foot splay measurements
body temperature

The parameters to analyze were identified as continuous, discrete or binary. Test-substance treated groups were then compared to the control using the following procedures.

#### Continuous parameters

For comparisons involving more than two groups, if Bartlett's test for variance homogeneity (Bartlett, 1937) was not significant at the 1% level, then parametric methods were applied. If the F1 approximate test for monotonicity (described below) of dose-response was not significant at the 1% level, Williams' test (Williams', 1971, 1972) for a monotonic trend was applied. If the F1 test was significant, suggesting that the dose-response was not monotone, Dunnett's test

(Dunnett, 1955, 1964) was performed instead. If Bartlett's test was significant at the 1% level, then logarithmic and square-root transformations were tried. If Bartlett's test was still significant, then non-parametric methods were applied to mean ranks. If the H1 approximate test for monotonicity (described below) was not significant at the 1% level, Shirley's test for a monotonic trend (Shirley, 1977) was applied. If the H1 test was significant, then Steel's test (Steel, 1959) was performed instead.

The F1 test is designed to detect significant departure from monotonicity of an ordered set of means. The test statistic compares the mean square, NMS, for the deviations of the absolute or adjusted means from the maximum likelihood means, calculated under a constraint of monotonicity, with the usual error mean square, EMS. The null hypothesis is that the true means are monotonically ordered. The test statistic is F1 = NMS/EMS which can be compared with standard tables of the F-distribution with 1 and error degrees of freedom.

The H1 test is the non-parametric equivalent of the F1 test. The test statistic compares the non-monotonicity sums of squares, NRSS, for the deviations of the mean ranks from the maximum likelihood mean ranks, with the non-parametric equivalent of the error sums of squares, ERSS=N(N+1)/12. The test statistic is H1 = NRSS/ERSS which can be compared to standard tables of the $\chi$2-distribution with 1 degree of freedom.

For comparisons involving only two groups, if Bartlett's test for variance homogeneity (Bartlett, 1937) was not significant at the 1% level, then parametric methods were applied. Comparisons were performed using t-tests. If Bartlett's test was significant at the 1% level, then logarithmic and square root transformations were tried. If Bartlett's test was still significant, then non-parametric methods were applied to mean ranks. Comparisons were performed using Wilcoxon rank sum tests (Wilcoxon, 1945).

For pre-treatment comparisons involving more than two groups, if Bartlett's test for variance homogeneity was not significant at the 1% level, then parametric methods were applied. Analysis of variance was used to test for any group differences. If the test was significant at the 5% level inter group comparisons using t-tests, with the error mean square from the one-way analysis of variance, were made. If Bartlett's test was significant at the 1% level, then logarithmic and square root transformations were tried. If Bartlett's test was still significant, then non-parametric methods were applied to mean ranks. Kruskal-Wallis' test (Kruskal and Wallis, 1952, 1953) was used to test for any group differences. If the test was significant at the 5% level, inter group comparisons using Wilcoxon rank sum tests (Wilcoxon, 1945) were made. Comparisons involving only two groups followed the above procedure except the Kruskal-Wallis test was not applied.

### Discrete parameters

For comparisons involving more than two groups, if the Jonckheere-Terpstra test (Jonckheere, 1954) was significant at the 5% level, then the direction of the trend was established and one-tailed step-down testing in this direction was performed. If the Jonckheere-Terpstra test was not significant at the 5% level, then the Kruskal-Wallis test (Kruskal and Wallis, 1952, 1953) was applied. If the Kruskal-Wallis test was significant at the

5% level, the test-substance treated groups were compared to the control using exact Wilcoxon rank sum tests (Wilcoxon, 1945), otherwise, no further comparisons were made.

Comparisons involving only two groups were performed using Wilcoxon rank sum tests (Wilcoxon, 1945).

For pre-treatment comparisons involving more than two groups, a Kruskal-Wallis test was performed. If the test was significant at the 5% level, treated groups were compared to control using exact Wilcoxon rank sum tests. Comparisons involving only two groups were performed using Wilcoxon rank sum tests.

### Binary parameters

For comparisons involving more than two groups, if the Cochran-Armitage test (Armitage, 1955) was significant at the 5% level, then the direction of the trend was established and one-tailed step-down testing in this direction was performed. If the Cochran-Armitage test was not significant at the 5% level, then the $\chi 2$ test (Armitage et al 2002) was applied. If the $\chi 2$ test was significant at the 5% level, the test-substance treated groups were compared to the control using Fisher's Exact tests (Fisher, 1973), otherwise, no further comparisons were made.

Comparisons involving only two groups were made using Fisher's Exact tests.

For pre-treatment comparisons involving more than two groups, an exact chi-squared test was performed. If the test was significant at the 5% level, treated groups were compared to control using Fisher's Exact tests. Comparisons involving only two groups were performed using Fisher's Exact tests.

### Statistical annotation

Significant differences between control and treated groups were expressed at the 5% ($p<0.05$) or 1% ($p<0.01$) level. The key to annotations used on the tables that contain statistical results is given below.

| | |
|---|---|
| l | Data were log transformed for the statistical analysis. |
| s | Data were square root transformed for the statistical analysis. |
| Av | Groups compared during the pretreatment period using Analysis of variance. |
| KW | Groups compared during the pretreatment period using Kruskal-Wallis test. |
| Du | Treated groups compared with Control using Dunnett's test. |
| Fe | Treated groups compared with Control using Fisher's Exact test. |
| Sh | Treated groups compared with Control using Shirley's test. |
| St | Treated groups compared with Control using Steel's test. |
| Wi | Treated groups compared with Control using Williams' test. |
| Tt | Groups compared using t-test. |
| Wc | Groups compared using Wilcoxon rank sum test. |

* $p<0.05$
** $p<0.01$

## 2.11 Data storage

All raw data, preserved specimens, 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. The Sponsor will determine the final disposition of these materials. Electronic raw data generated at the Testing Facility are maintained on the computer system on which the data application resides or archived off-line.

Biological samples collected for clinical pathology will be stored for up to 6 months after completion of assays and then discarded.

All raw data generated as well as the original signed report for Genotoxicity and neuropathology by Envigo-UK were transferred to the Testing Facility for archiving. Electronic raw data generated by the Test Sites were maintained in accordance with their GLP archiving procedures. In addition, the retained Quality Assurance records relevant to this study will be stored at Test Site for a period of 20 years.

All raw data as well as the original signed report for immunotoxicity by ImmunoTox, a division of AIBioTech will be transferred to the Testing Facility for archiving. All raw data as well as the original signed report for GFAP by US Centers for Disease Control (CDC) and Prevention Health Effects Laboratory Division – NIOSH will be transferred to the Testing Facility for archiving. Electronic raw data generated by the Test Sites will be maintained by the Test Site in accordance with their GLP archiving procedures.

## 2.12 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. Due to an electrical fire on 9 September 2015, staff had to evacuate the Testing Facility for approximately 6 hours commencing at approximately 12:15 PM. Upon re-entry to the facility, the welfare of the animals was the top priority. As a result of the site evacuation and some site limitations over subsequent days, the samples in a -20 °C freezer were found thawed. The remaining serum chemistry samples were discarded before 6 month of completion of the assays.

2. Because a grace day was built into the Pristima protocol, food consumption was measured over a 6-day period during the week prior to the start of dosing. The Pristima protocol was amended to remove the grace day to ensure the protocol requirement of a 7-day period was met for the remainder of the study.

3. The animals assigned to the genotoxicity study were not weighed during Week 1 of the study (a week was defined as a 7-day period). This was due to an incorrect start date assigned to these animals which resulted in the animals not being weighed as scheduled. The Pristima protocol was amended to collect the data to ensure the protocol requirement of a 7-day week was met for the remainder of the study.

4. During the pretest chamber trails, a charcoal tube was not collected from the Group 1 chamber.

5. Although the protocol required each animal be assigned a temporary identification number upon receipt. The animals were not tattooed on the day of receipt; however, they did have a cage card indicating the numbers of the animal should in the cage.

6. On Day 21, Animal No. 3035 was found housed with female Animal Nos. 3533, 3534 and 3535. Based on confirmation of a sperm plug being present in the vagina of Animal No. 3534, this animal was determined to be pregnant.

7. During the sacrifice of Animal No. 2528, the hypothalamus was lost during dissection and was not available for weighing and processing.

8. On Day 59, the temperature was recorded but was crossed out on the exposure record; however, the crossed out value was not followed up with an explanation of cross out with the recorder's initial and date until the following day. Therefore, the temperature was not taken 12 times during the exposure instead of the requirement of 13 times.

9. Due to an apparent typographical typing error, only 9 animals/sex/group were assessed during the pretest interval of functional observational battery evaluations. Animal No. 1024 was scheduled for evaluation on 11 February 2015 and Animal No. 1027 was scheduled for evaluation on 12 February 2015. However, the data collection forms for functional observational battery evaluations on 12 February 2015 listed Animal No. 1024 instead of Animal No. 1027. At this time, it cannot be determined which animal was evaluated on 12 February 2015; therefore, the second value collected on 12 February 2015 for this animal was not reported.

10. The tissues and organs from Animal No. 3508 were inadvertently processed to slide and stained. The slides were not evaluated and the blocks and stained slides were archived.

11. Documentation to indicate that the dose formulation for the positive control (cyclophosphamide) was swirled prior to use, was not recorded. Therefore, it cannot be confirmed if the protocol requirement that the positive control (cyclophosphamide) formulation should be swirled prior to use was met.

12. A food consumption measurement was not taken for animals in Cage 48 (Animal Nos. 4017 and 4018) for Week 7. This was the result of a full feeder weight being taken prior to an empty feeder weight in Pristima data collection system during the previous week.

13. Contrary to section 10.1 of the study protocol, macroscopic observations were not recorded for the neurohistopathology animals in error. The microscopic evaluation of the processed tissues revealed no test substance related effects.

14. Various tissues which were required to be examined from several animals on study were noted as missing at the time of microscopic examination.

# 3. Results and Discussion

## 3.1 Chamber monitoring results

(Annex 2 and Annex 3)

Gas chromatography analysis (see Annex 2) of the major components in the neat test substance and the test atmospheres showed a reasonably close comparison between the neat test substance and the vaporized test substance. This data demonstrated that the test animals were exposed, as expected, to all of the major components of the test substance in their reasonably proper proportion. The data were consistent from week-to-week during the study indicating stability of the test substance and the atmosphere generation techniques.

On Exposure Day 20, the samples 1005M and 1005F from the Group 1 air control chambers showed results similar in profile to results routinely seen from samples collected from the Groups 2-4 test substance chambers. An investigation of these results did not find any evidence of improper sample collection or contamination during sample processing and analysis. However, the IR continuous atmosphere monitoring instrument showed no appreciable test substance in the Group 1 chambers and no other Group 1 samples during this study showed similar results, including duplicate Group 1 samples collected on the same day. Further, it is unlikely there was sufficient leak of test substance into the room air that also supplied the air into the Group 1 chambers. The results are anomalous and occurred nowhere else during the course of the study.

Overall target, nominal and achieved (per IR analysis) mean exposure concentrations (see Annex 3) are summarized below:

| Group | Test Substance | Atmosphere Concentration (mg/m$^3$) | | |
|---|---|---|---|---|
| | | Target | Nominal* | Achieved* |
| 1 | Air Control | 0 | 0 | 0 |
| 2 | Gasoline Isobutanol Vapor Condensate | 2,000 | 2,485 | 2,064 |
| 3 | Gasoline Isobutanol Vapor Condensate | 10,000 | 12,670 | 10,340 |
| 4 | Gasoline Isobutanol Vapor Condensate | 20,000 | 21,950 | 20,810 |

*Average of the 2 chambers used for each group.

By IR analysis, no Gasoline Isobutanol Vapor Condensate was detected in Group 1 samples. Mean atmosphere concentrations were on average for the 2 chambers used for each group 3.2%, 3.4% and 4.1% above target for Groups 2, 3 and 4, respectively.

The differences between the nominal and measured concentrations for Groups 2 and 3 may be attributed to the limited sensitivity of the balance used to weigh test substance storage cylinders and the small volume of test substance dispensed during each exposure.

Particle size analysis confirmed the absence of condensation aerosol in all groups during pretest evaluations and throughout the study.

Oxygen levels during animal exposure met protocol requirements of 19% or higher.

All room environmental monitoring for test substance, light and sound were within protocol specifications.

## 3.2 Mortality

(Appendix 1)

All animals survived until the completion of exposures.

## 3.3 Clinical observations

(Table 1, Appendix 2, Appendix 3 and Appendix 4)

There were no test substance-related clinical signs.

## 3.4 Ophthalmology

(Annex 4)

There were no test substance-related ocular signs.

## 3.5 Body weights

(Figure 1, Figure 2, Table 2, Table 3, Appendix 5 and Appendix 6)

There were no test substance-related effects on body weights

## 3.6 Food consumption

(Figure 3, Figure 4, Table 4 and Appendix 7)

There were no test substance-related effects on food consumption.

## 3.7 Motor activity

(Figure 5, Figure 6, Table 5, Appendix 8 and Annex 11)

There were no test substance-related effects on motor activity. While there were some statistically significant differences at some measurement intervals in Weeks 4 and 8 but not at

Week 13, the incidences were isolated and not seen consistently or in an exposure level-related pattern.

## 3.8 Functional observational battery

(Table 6 and Appendix 9)

There were no test substance-related effects on functional observational battery.

## 3.9 Clinical pathology

### 3.9.1 Hematology

(Table 7, Appendix 10 and Annex 5)

There were no test substance-related hematology changes at Week 5 or the end of exposures.

All differences from controls, statistically significant or otherwise, were not considered to be test substance-related due to their direction, small magnitude, infrequent occurrence, lack of relation to exposure level, and/or because values were comparable to the study control range.

### 3.9.2 Coagulation

(Table 8, Appendix 11 and Annex 5)

There were no test substance-related coagulation changes at the end of exposures.

All differences from controls, statistically significant or otherwise, were not considered to be test substance-related due to their direction, small magnitude, infrequent occurrence, lack of relation to exposure level, and/or because values were comparable to the study control range.

### 3.9.3 Clinical chemistry

(Table 9, Appendix 12 and Annex 5)

There were no test substance-related clinical chemistry changes at Week 5 or the end of exposures.

All differences from controls, statistically significant or otherwise, were not considered to be test substance-related due to their direction, small magnitude, infrequent occurrence, lack of relation to exposure level, and/or because values were comparable to the study control range

## 3.10 Genotoxicity evaluations

(Annex 7)

A statistically significantly increase in the frequency of micronucleated polychromatic erythrocytes was observed in male Crl:CD(SD) IGS rats treated with Gasoline Isobutanol Vapor

Condensate at 2000mg/m$^3$ only, compared to air control values ($p<0.05$). Individual values for %MPCE are within the current vehicle historical control range and therefore the statistically significant increase is not considered to be biologically significant. There was no statistically significant decreases in the proportion of polychromatic erythrocytes observed in male Crl:CD(SD) IGS rats treated with Gasoline Isobutanol Vapor Condensate at any treatment level, compared to air control values.

No statistically significant increases in the frequency of micronucleated polychromatic erythrocytes and no statistically significant decreases in the proportion of polychromatic erythrocytes were observed in female Crl:CD(SD) IGS rats administered Gasoline Isobutanol Vapor Condensate at any treatment level, compared to air control values.

The positive control compound, Cyclophosphamide, produced a statistically significant increase in the frequency of micronucleated polychromatic erythrocytes ($p<0.01$ male and female animals) and a statistically significant decrease in the proportion of polychromatic erythrocytes ($p<0.05$ male animals only).

It is concluded that Gasoline Isobutanol Vapor Condensate did not show any evidence of causing an increase in the induction of micronucleated polychromatic erythrocytes or bone marrow cell toxicity in male or female Crl:CD(SD) IGS rats when administered by inhalation exposure in this in vivo test procedure.

## 3.11 Immunotoxicity evaluations

(Annex 8)

Exposure to Gasoline Isobutanol Vapor Condensate resulted in no effects in spleen cell number or in the IgM antibody-forming cell (AFC) response to the T-dependent antigen, sheep erythrocytes, when evaluated as either Specific Activity (AFC/$10^6$ Spleen Cells) or as Total Spleen Activity (AFC/Spleen). The positive control, cyclophosphamide (CPS), produced the anticipated results in the various parameters evaluated.

In conclusion, the results of this immunotoxicological evaluation demonstrate that, under the experimental conditions used, exposure to the Gasoline Isobutanol Vapor Condensate test substance did not adversely affected the functional ability of the humoral immune component of the immune system. Therefore, based on this study, the No Observed Adverse Effect Level (NOAEL) was 20,000 mg/m$^3$.

## 3.12 GFAP evaluations

(Annex 9)

The 13-week exposure to Gasoline Isobutanol Vapor Condensate did not affect GFAP levels in any brain region in either male or females. These data suggest that under the exposure conditions employed, damage-induced gliosis did not occur in any of the brain regions examined. Overall, these data suggest that under the exposure conditions employed, damage-induced gliosis as a function of exposure to Gasoline Isobutanol Vapor Condensate did not occur in the brain regions

examined. Toxicant-induced gliosis (as reflected by an enhanced expression of GFAP) is highly dose-, region-, and time-dependent. Therefore, it is possible that exposure to higher concentrations, examination of more brain regions, examination of more discrete dissections of a given brain region, or the inclusion of more time points, might have resulted in positive findings. In conclusion, exposure to Gasoline Isobutanol Vapor Condensate did not appear to result in gliosis in eight representative brain regions in males or females.

## 3.13 Neuropathology evaluations

(Annex 10)

There were no findings in the tissues examined from the neurohistopathology phase of this study which were considered to be related to treatment with Gasoline Isobutanol Vapor Condensate.

There were no effects of treatment on the weight or size of the brains of animals treated with Gasoline Isobutanol Vapor Condensate compared to controls.

Thus, following a 13 week inhalation (whole body) exposure of CD rats to Gasoline Isobutanol Vapor Condensate, there were no findings in the tissues examined from the neurohistopathology phase of this study which were considered to be related to treatment.

## 3.14 Organ weights

(Table 10, Table 11, Table 12, Appendix 13 and Annex 6)

At the terminal sacrifice, Gasoline Isobutanol Vapor Condensate-related organ weight changes were not present.

At the recovery sacrifice, Gasoline Isobutanol Vapor Condensate -related organ weight changes were not present. In males, statistically significant lower mean absolute or relative organ weights were observed in adrenal glands and epididymides when compared to controls. In females, statistically significant higher mean absolute or relative organ weights were observed in heart and kidneys when compared to controls. These were not considered test substance-related because they were of low magnitude and/or did not occur in the terminal sacrifice rats.

## 3.15 Pathology

### 3.15.1 Macroscopic

(Table 13, Appendix 14 and Annex 6)

At the terminal sacrifice, Gasoline Isobutanol Vapor Condensate -related macroscopic findings were not present.

A firm perigenital subcutaneous mass was present in 1 female rat exposed to 20,000 mg/m$^3$. This correlated microscopically to a mammary fibroadenoma. This finding was considered an incidental background finding because it was present in only one animal and is a common tumor in female rats.

All other macroscopic findings occurred sporadically or at similar incidence and severity in the control and Gasoline Isobutanol Vapor Condensate -exposed groups and were considered incidental.

At the recovery sacrifice, Gasoline Isobutanol Vapor Condensate -related macroscopic findings were not present.

All macroscopic findings occurred sporadically or at similar incidence and severity in the control and Gasoline Isobutanol Vapor Condensate -exposed groups and were considered incidental.

### 3.15.2 Microscopic

(Table 14, Appendix 14 and Annex 6)

Hyaline droplet accumulation (minimal to moderate) was present in the kidneys of all male rats exposed to Gasoline Isobutanol Vapor Condensate at 20,000 mg/m$^3$. Hyaline droplet accumulation was consistent with alpha$_{2u}$-globulin nephropathy and was characterized by eosinophilic cytoplasmic droplets in the proximal tubules of the cortex, exfoliation of sporadic cells into tubular lumens, and formation of granular casts at the junction of the outer and inner stripes of the outer medulla.

Chronic progressive nephropathy (minimal to mild) was present in the kidneys of male rats exposed to Gasoline Isobutanol Vapor Condensate at 20,000 mg/m$^3$. Chronic progressive nephropathy occurred at higher incidence and greater severity in gasoline isobutanol vapor condensate-exposed rats than in control animals. This finding was characterized by basophilic proximal tubules with or without simple tubular hyperplasia. Thickened basement membranes, tubular atrophy, tubular dilation, glomerular sclerosis, mononuclear infiltrates, and medullary hyaline casts were variably present.

**Text Table 3.15.2-1 Test substance-related findings in the kidneys of rats exposed to Gasoline Isobutanol Vapor Condensate for 13 weeks**

| Group/sex | 1M | 2M | 3M | 4M | 1F | 2F | 3F | 4F |
|---|---|---|---|---|---|---|---|---|
| Exposure Level (mg/m$^3$) | 0 | 2,000 | 10,000 | 20,000 | 0 | 2,000 | 10,000 | 20,000 |
| Accumulation, hyaline droplets | | | | | | | | |
| Minimal | 0 | - | - | 1 | 0 | - | - | 0 |
| Slight | 0 | - | - | 7 | 0 | - | - | 0 |
| Moderate | 0 | - | - | 2 | 0 | - | - | 0 |
| Total | 0 | - | - | 10 | 0 | - | - | 0 |
| Nephropathy, Chronic Progressive | | | | | | | | |
| Minimal | 2 | - | - | 2 | 0 | - | - | 1 |
| Slight | 0 | - | - | 5 | 0 | - | - | 0 |
| Total | 2 | - | - | 7 | 0 | - | - | 1 |
| Number of tissues examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |

All other microscopic findings occurred sporadically or at similar incidence and severity in control and test substance treated groups and were considered incidental and due to biological variability.

At the recovery sacrifice, the right kidney of one 20,000 $mg/m^3$ male was examined as a result of renal depressions observed macroscopically. Non-correlating minimal hyaline droplet accumulation consistent with $alpha_{2u}$-globulin nephropathy and minimal chronic progressive nephropathy were observed in this animal.

# 4. Conclusion

Hyaline droplet accumulation (minimal to moderate) was present in the kidneys of all male rats exposed to Gasoline Isobutanol Vapor Condensate at 20,000 mg/m$^3$. Alpha$_{2u}$-globulin nephropathy in rats is a known effect of exposure to unleaded gasoline. This finding is specific to male rats and is not considered relevant to human risk assessment. Exacerbation of spontaneous chronic progressive nephropathy is frequently reported with alpha$_{2u}$-globulin nephropathy. Alpha$_{2u}$-globulin nephropathy in male rats has also been associated with an increased incidence of renal tumors due to sustained proliferative effects secondary to overload-associated cellular loss. It is unnecessary to routinely use special histochemical stains for hyaline droplets to make the diagnosis of alpha$_{2u}$-globulin nephropathy. Special stains are most useful when there are unusual presentations, such as incidence in females or abnormal histologic features of the droplets, neither of which were present in this study.

Whole-body inhalation exposure of Gasoline Isobutanol Vapor Condensate at 2,000, 10,000 and 20,000 mg/m$^3$ was not associated with any other adverse effects on male or female rats.

Under the conditions of this study, the NOAEL (no observed adverse effect level) for Gasoline Isobutanol Vapor Condensate was considered to be 20,000 mg/m$^3$ for systemic effects.

# 5. References

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FIGURE 1 Body weight - group mean values (g) - males

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

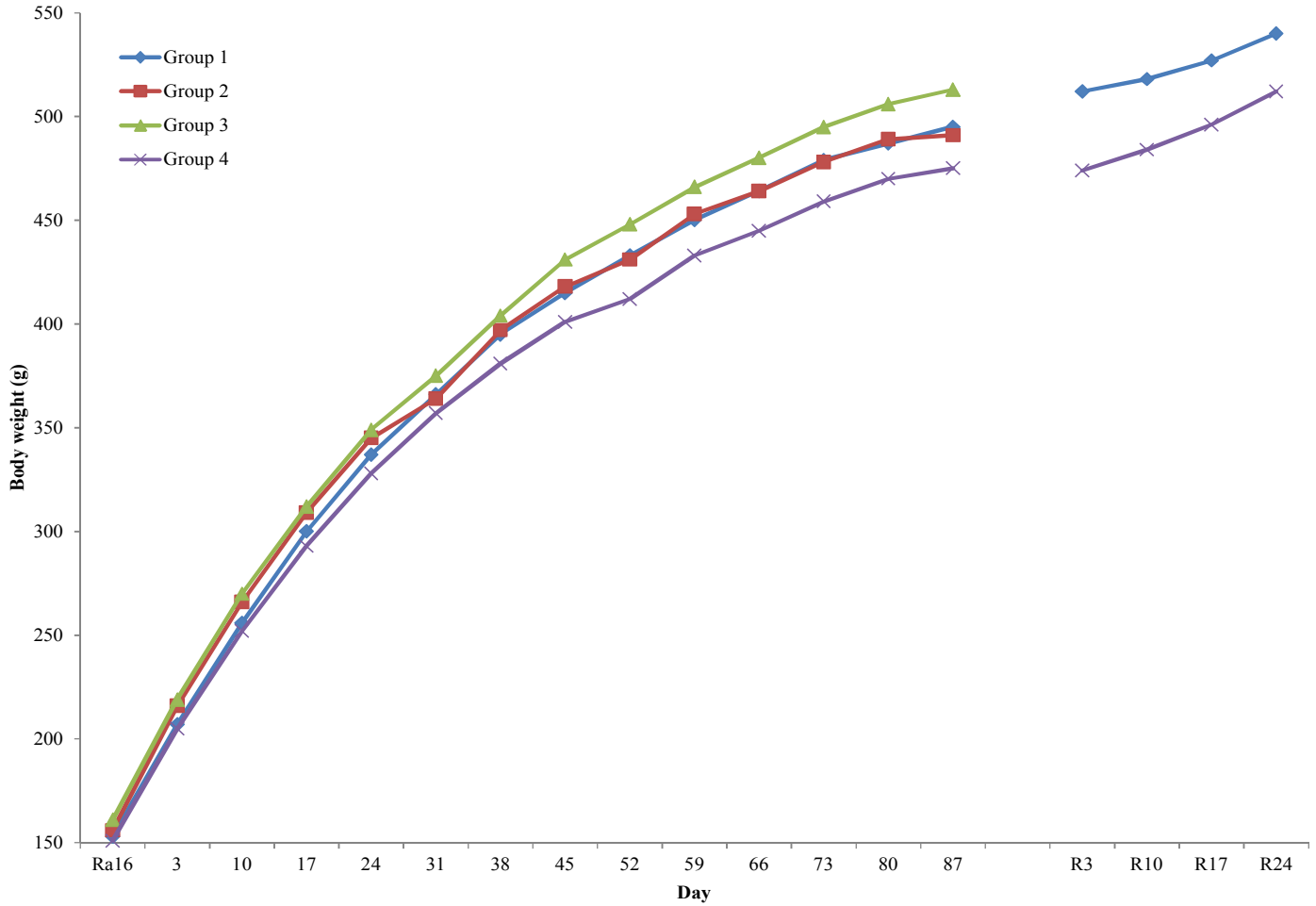


FIGURE 2 Body weight - group mean values (g) - females

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

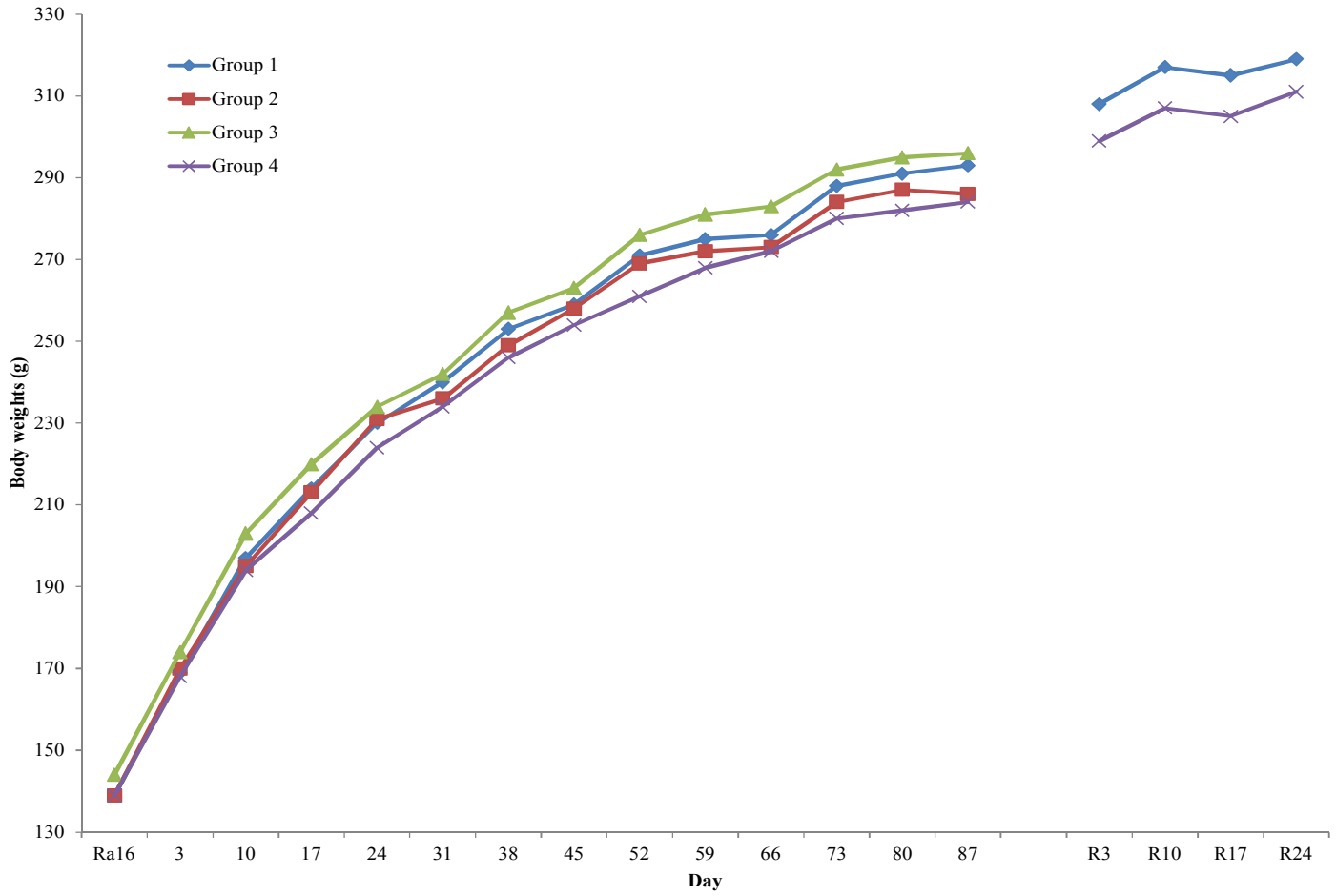


FIGURE 3 Food consumption - group mean values (g/animal/day) - males

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

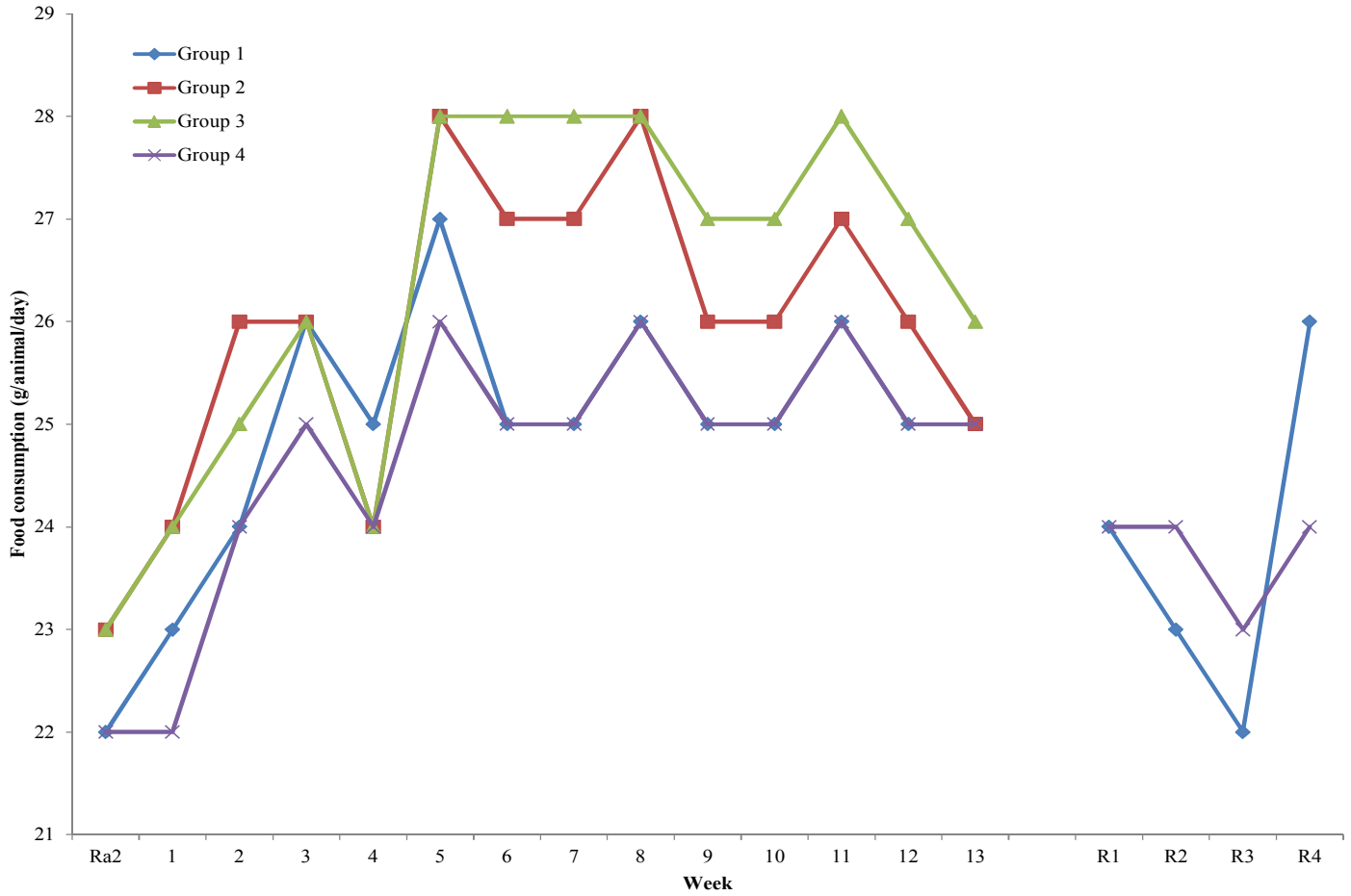


FIGURE 4 Food consumption - group mean values (g/animal/day) - females

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

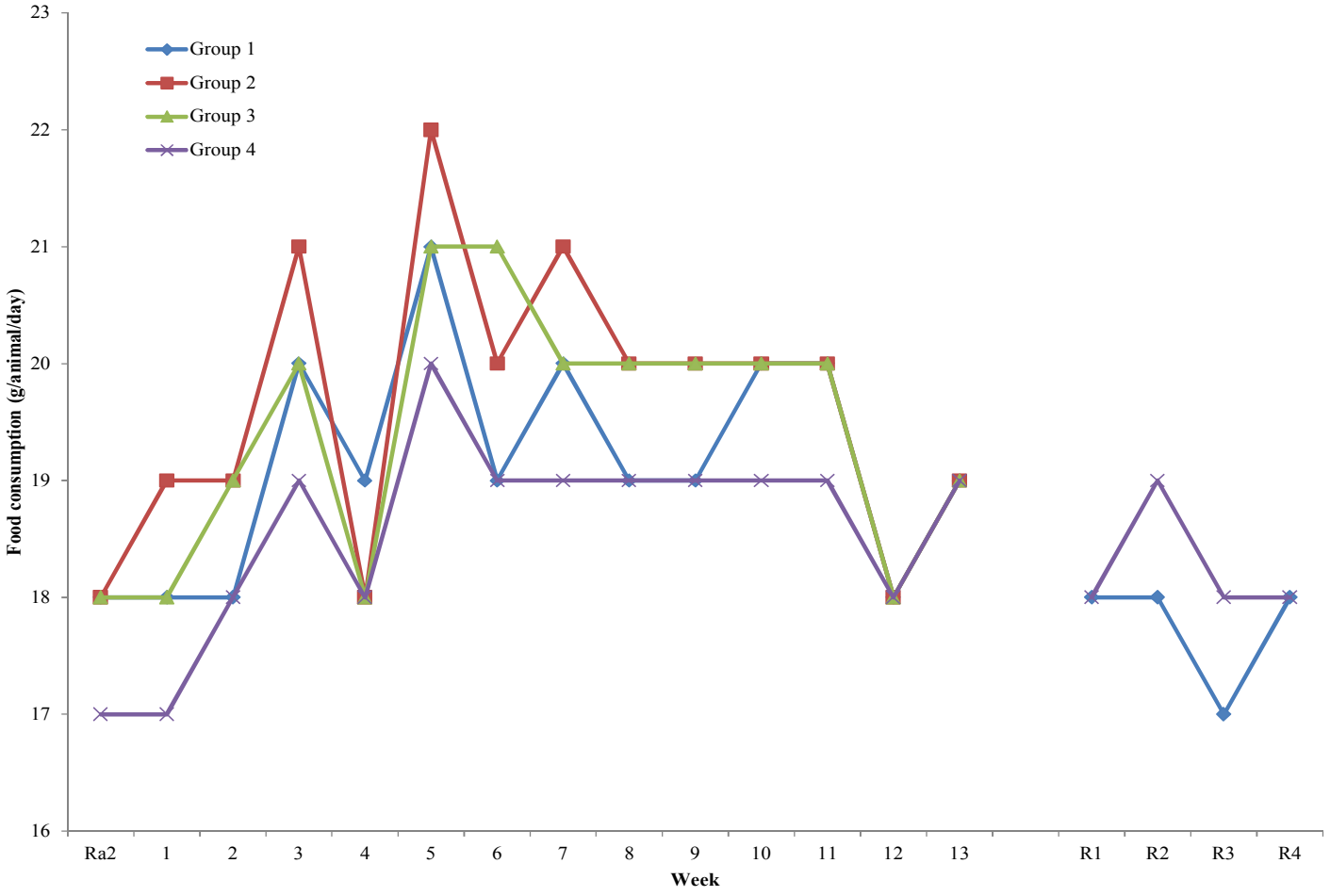
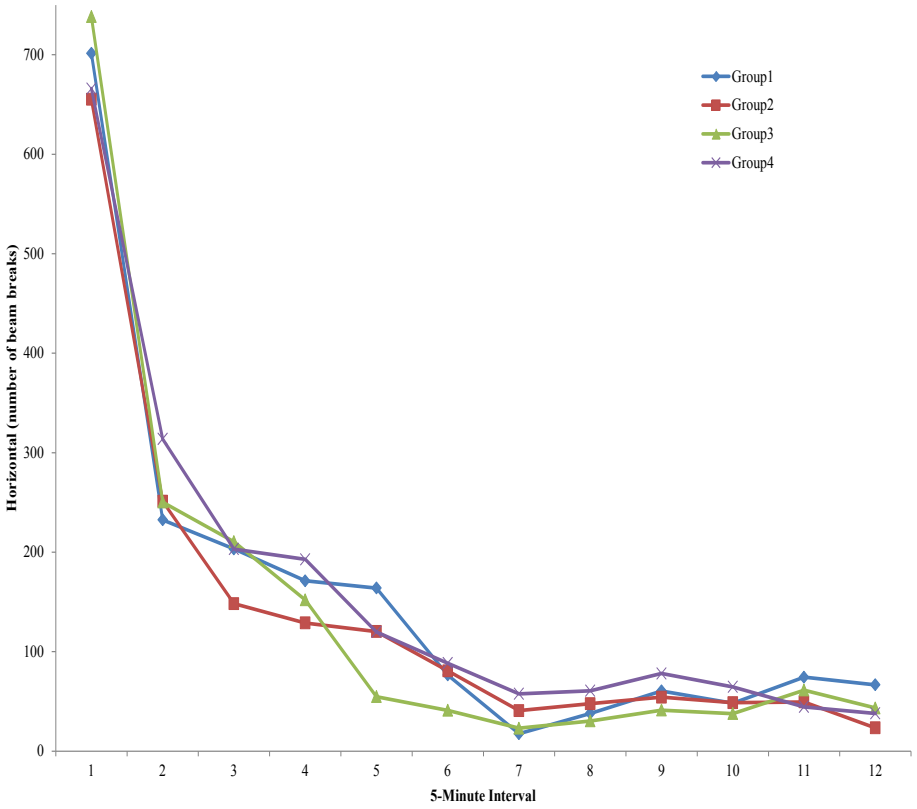


FIGURE 5 Motor activity - pretest (number of beam breaks) - males

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |



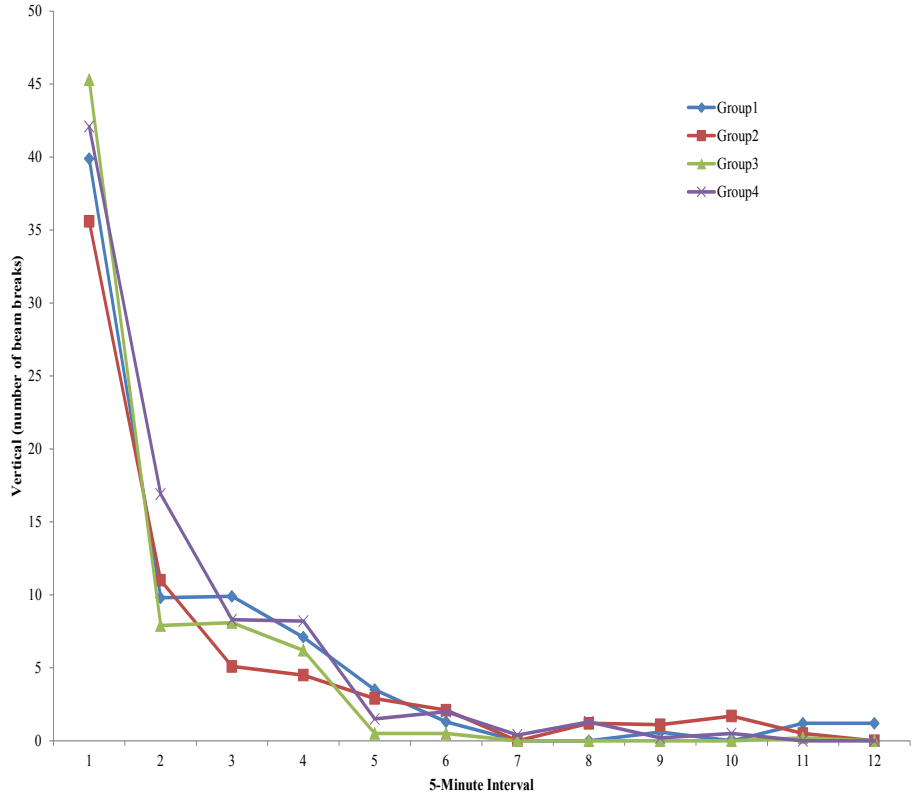
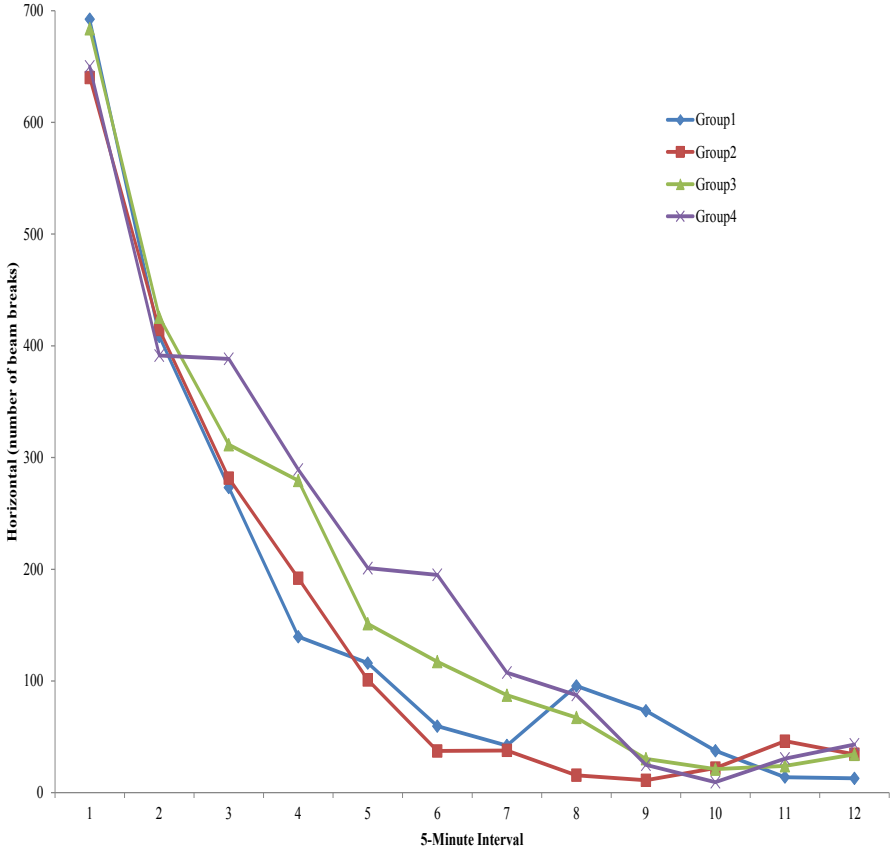



FIGURE 5 (cont) Motor activity - week 4 (number of beam breaks) - males

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |



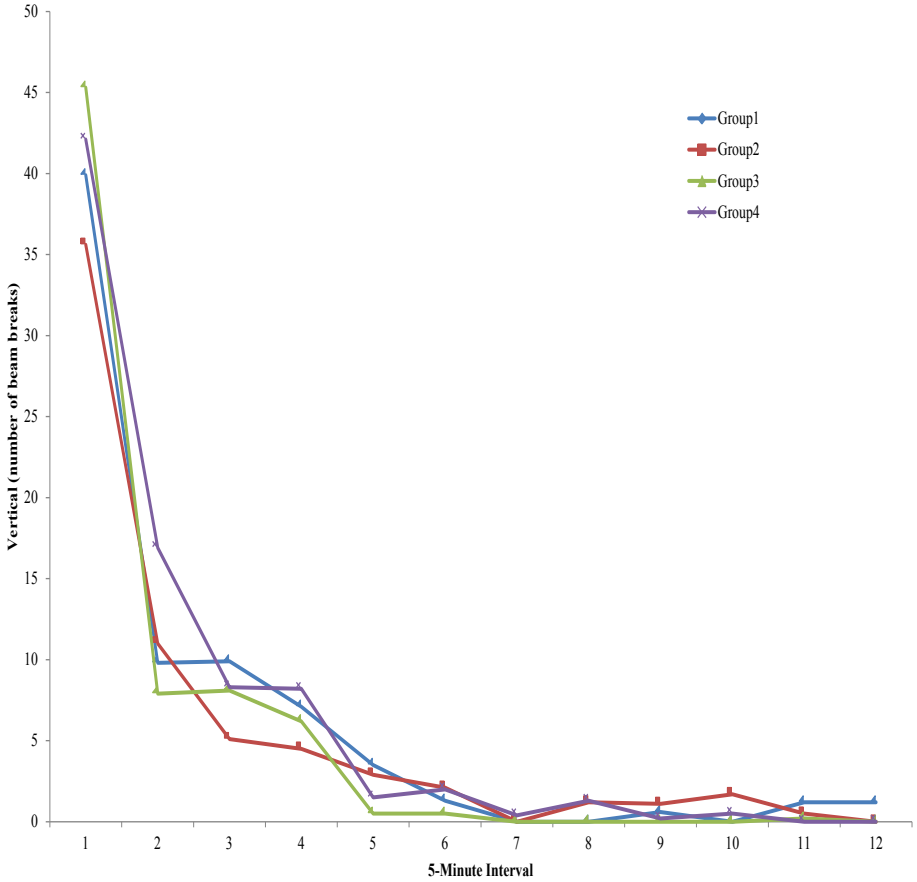
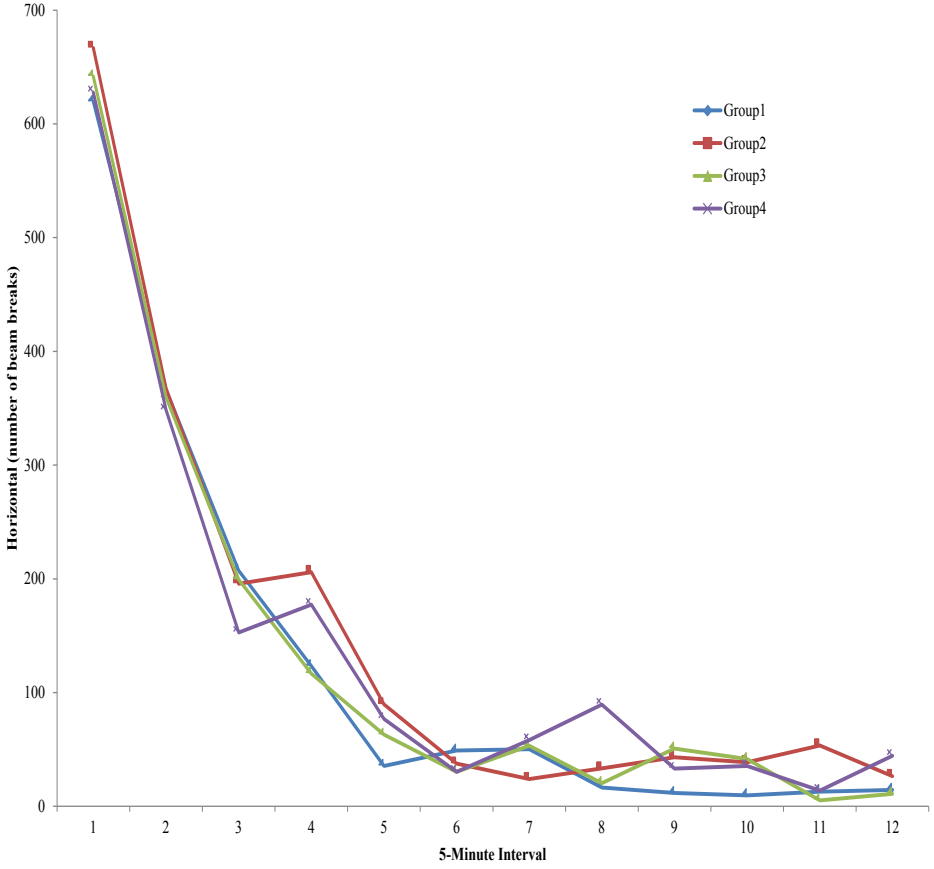



FIGURE 5 (cont) Motor activity - week 8 (number of beam breaks) - males

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose (mg/m$^3$) | | 2000 | 10000 | 20000 |



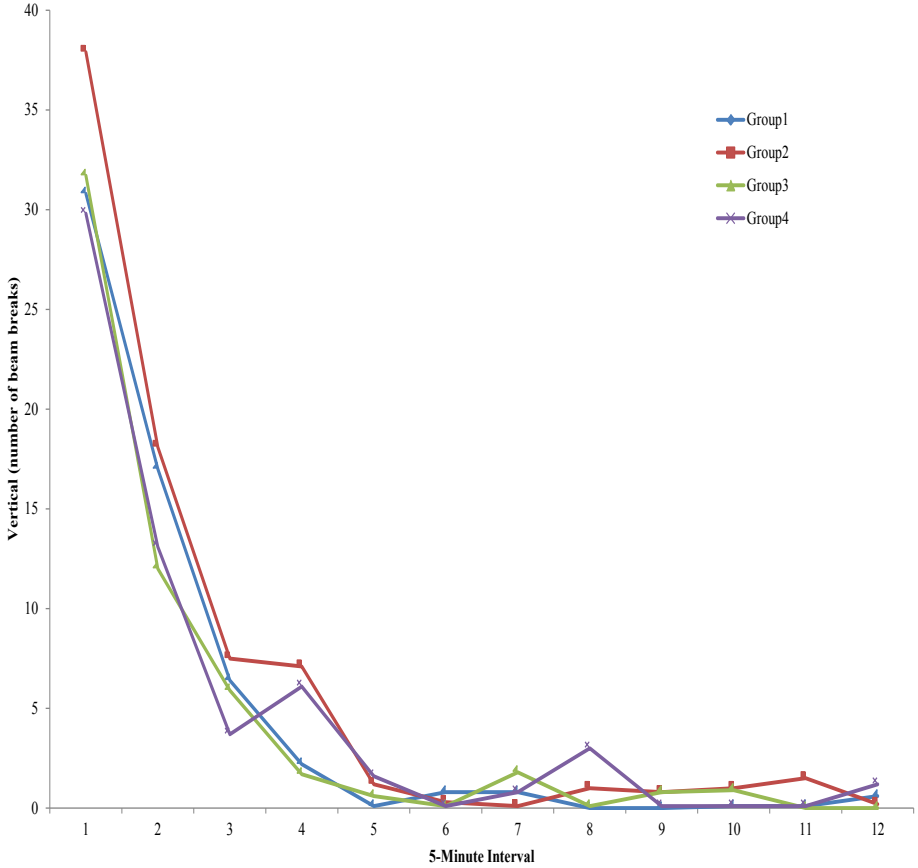
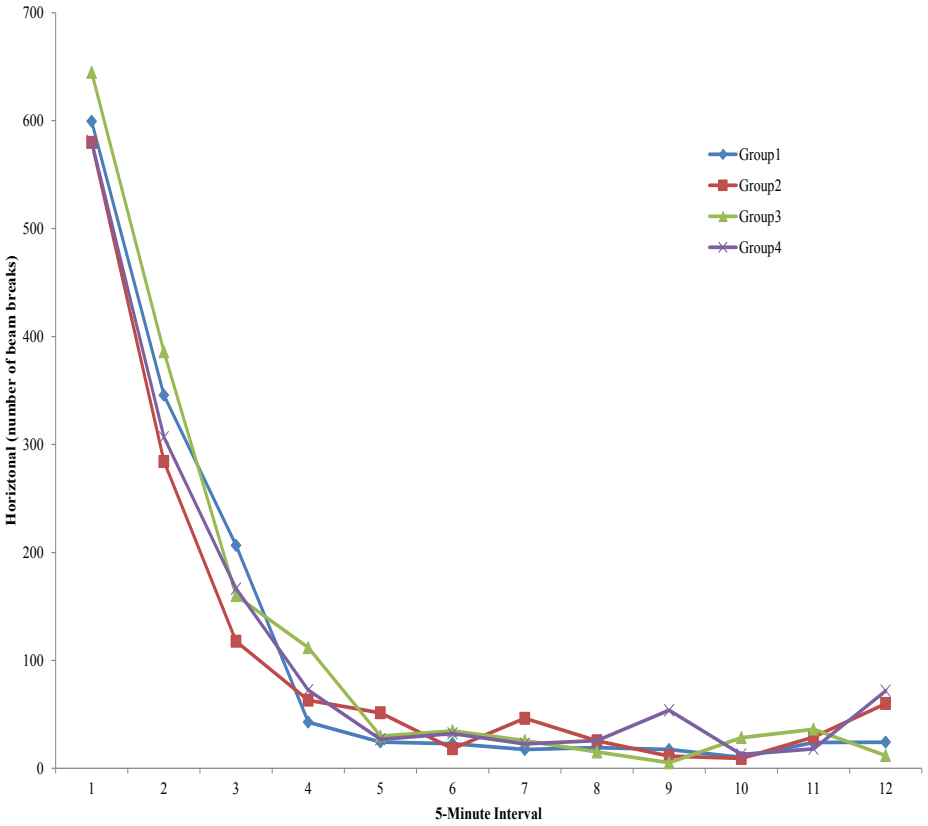



FIGURE 5 (cont) Motor activity - week 13 (number of beam breaks) - males

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |



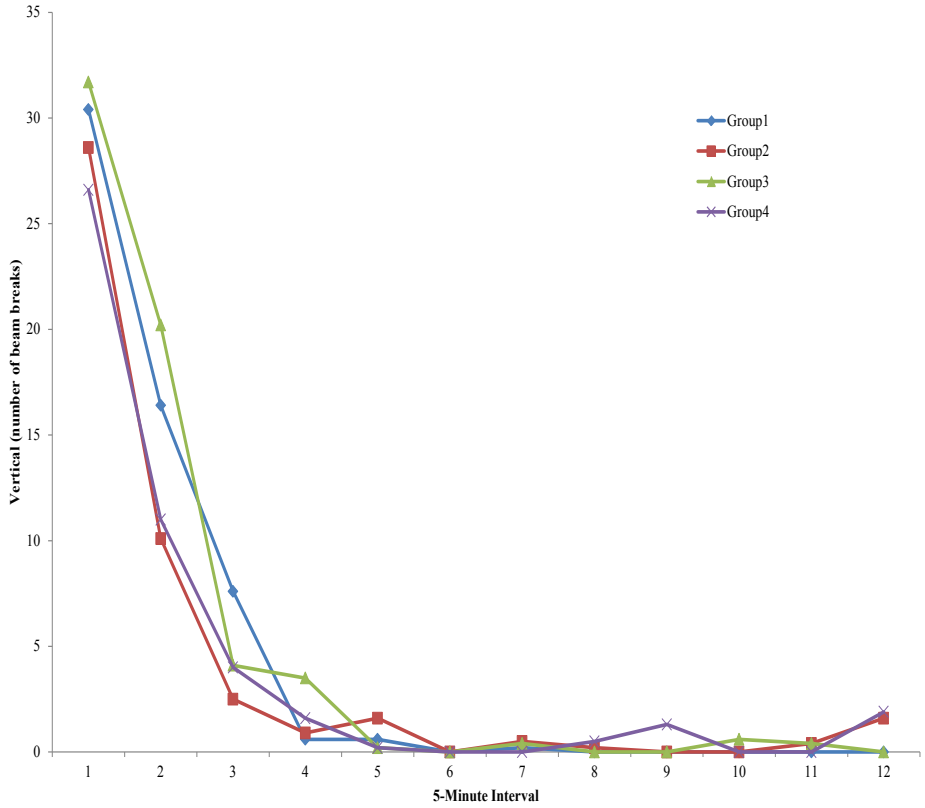
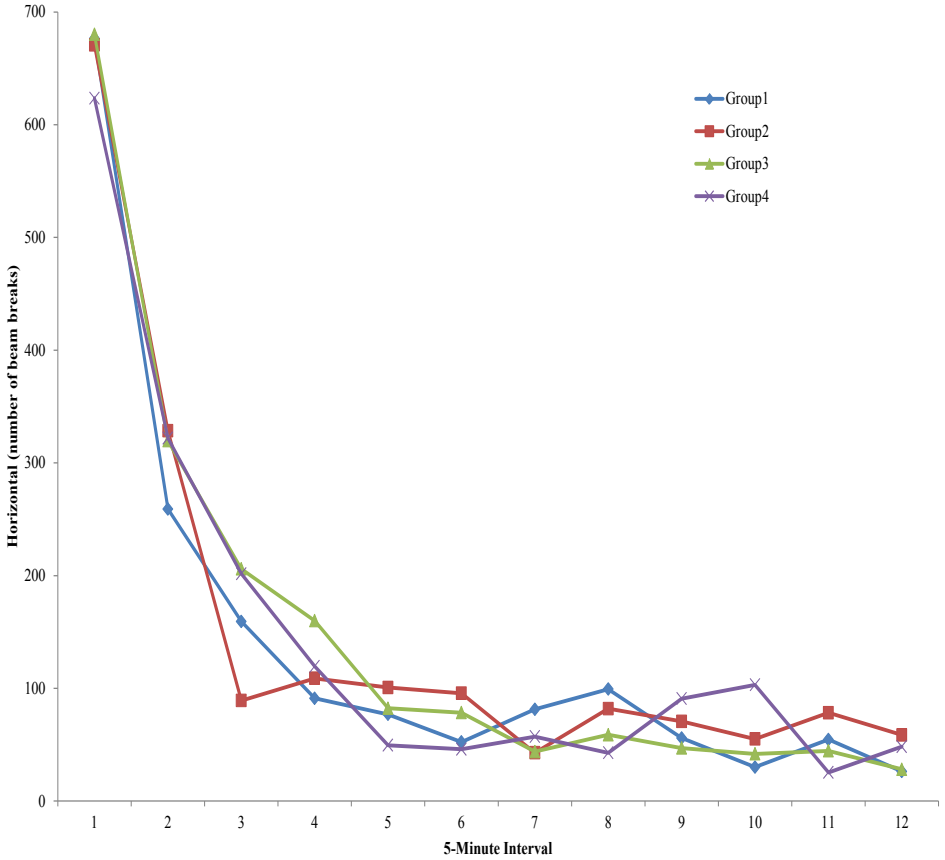



FIGURE 6 Motor activity - pretest (number of beam breaks) - females

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |



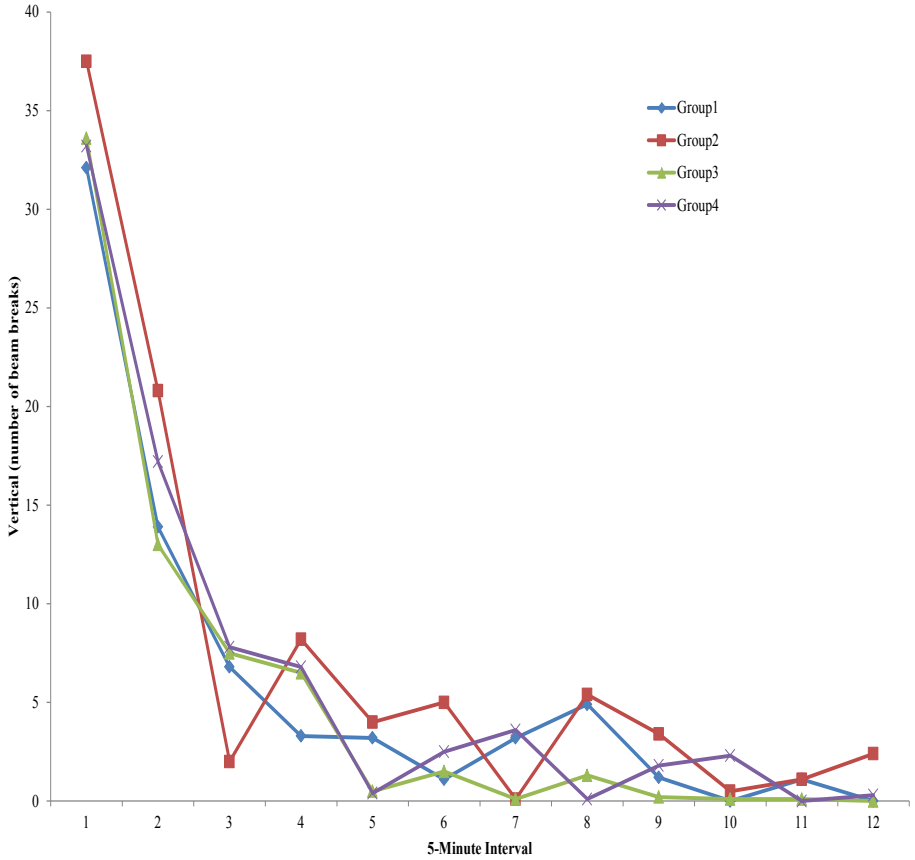
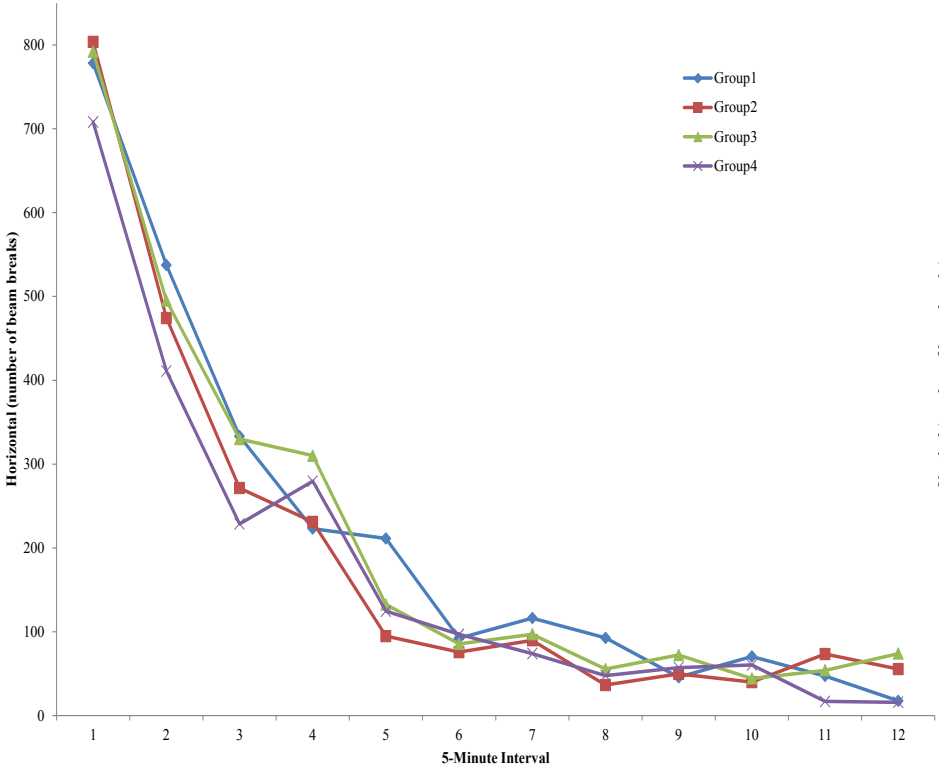



FIGURE 6 (cont) Motor activity - week 4 (number of beam breaks) - females

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose (mg/m$^3$) | | 2000 | 10000 | 20000 |



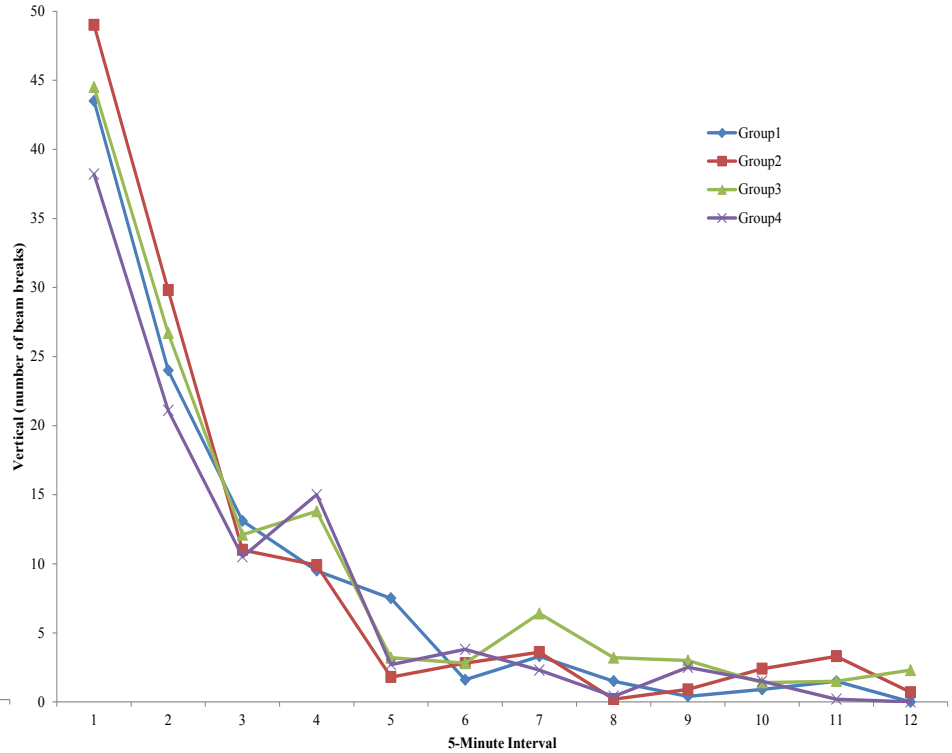
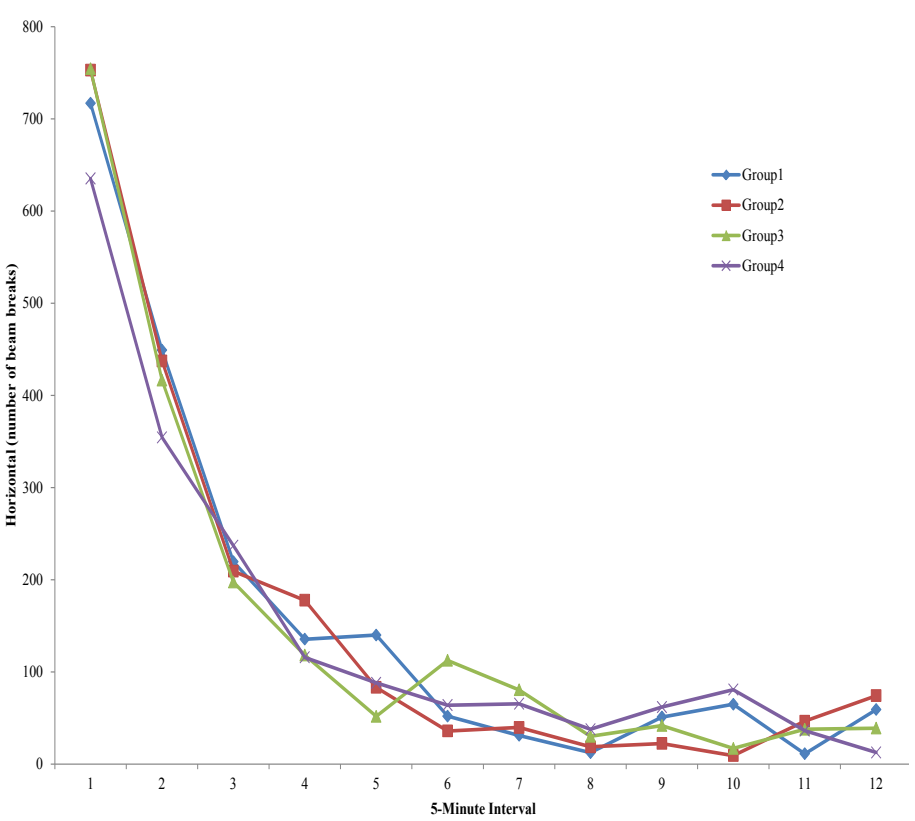



FIGURE 6 (cont) Motor activity - week 8 (number of beam breaks) - females

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose (mg/m$^3$) | | 2000 | 10000 | 20000 |



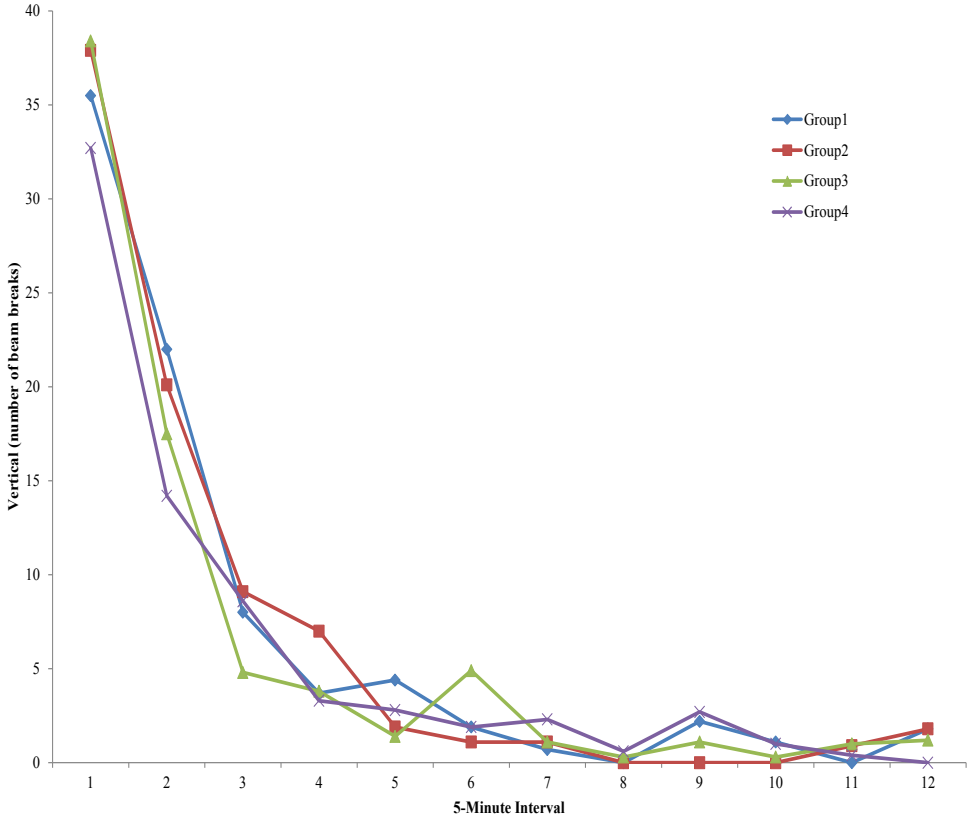
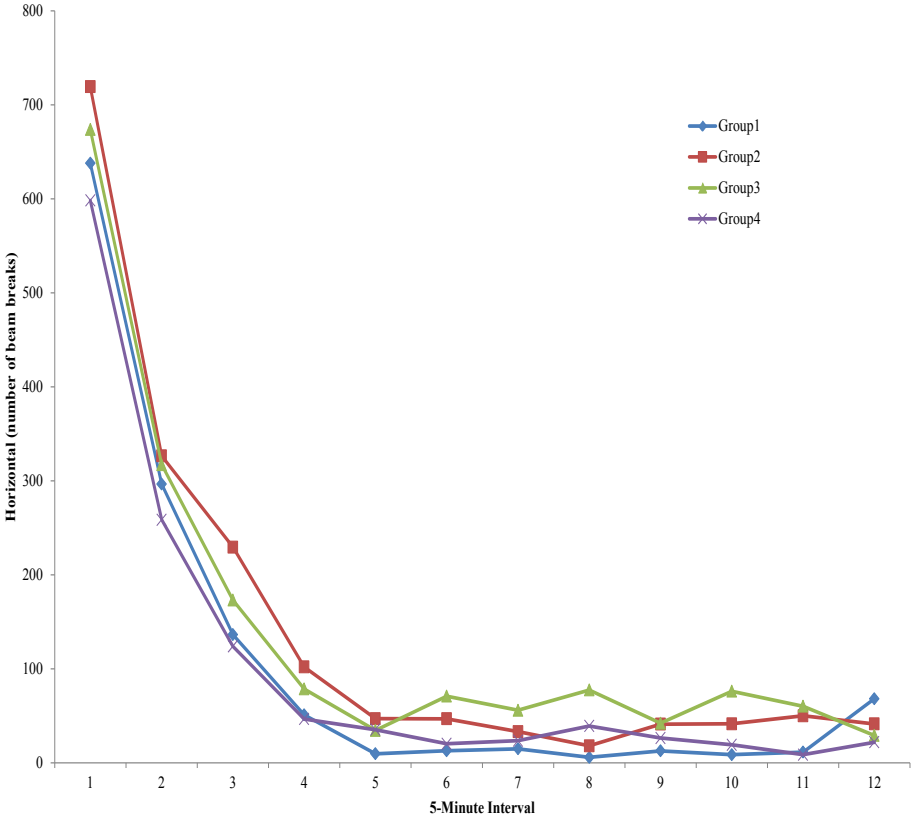



FIGURE 6 (cont) Motor activity - week 13 (number of beam breaks) - females

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose (mg/m$^3$) | | 2000 | 10000 | 20000 |



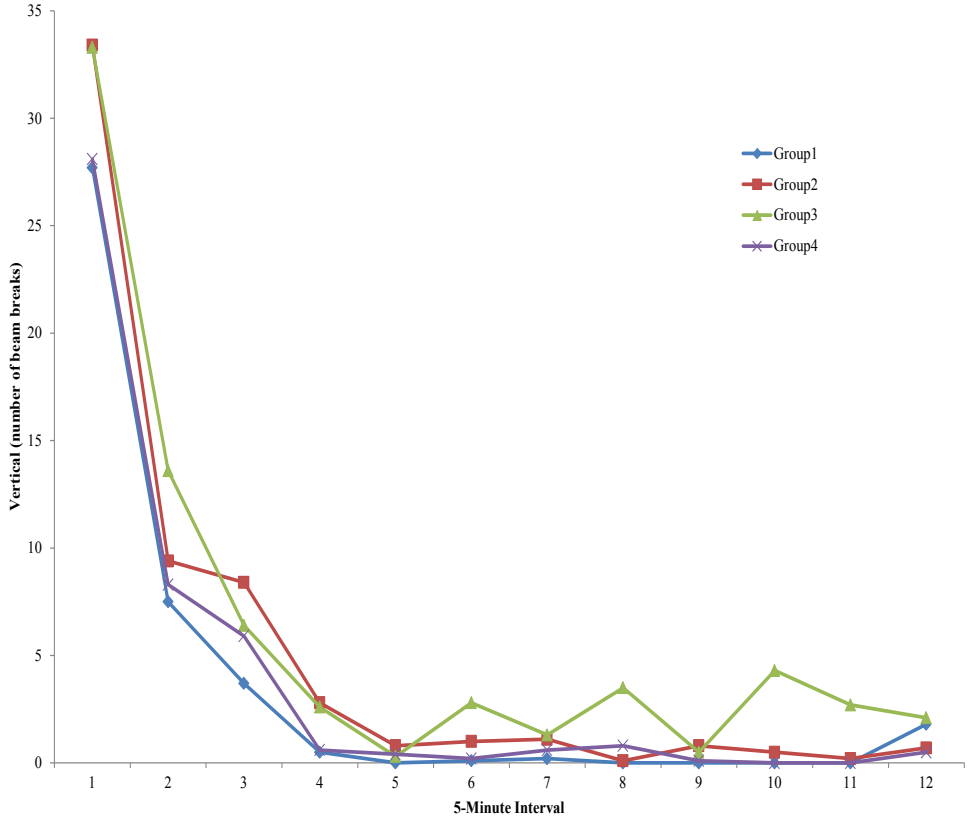



TABLE 1 Signs - group distribution of observations

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Category | Observation | Week | Group/Sex: | Number of animals affected | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1M | 2M | 3M | 4M | 1F | 2F | 3F | 4F |
| | | | Initial no: | 20 | 10 | 10 | 20 | 20 | 10 | 10 | 20 |
| Normal | Within normal limits | Ra3 | | 20 | 10 | 10 | 20 | 20 | 10 | 10 | 20 |
| | | 1 | | 20 | 10 | 10 | 20 | 20 | 10 | 10 | 20 |
| | | 2 | | 20 | 10 | 10 | 20 | 20 | 10 | 10 | 20 |
| | | 3 | | 20 | 10 | 10 | 20 | 20 | 10 | 10 | 20 |
| | | 4 | | 20 | 10 | 10 | 20 | 20 | 10 | 10 | 20 |
| | | 5 | | 19 | 10 | 10 | 20 | 20 | 10 | 10 | 20 |
| | | 6 | | 19 | 10 | 10 | 20 | 20 | 9 | 10 | 20 |
| | | 7 | | 18 | 10 | 10 | 20 | 20 | 9 | 10 | 20 |
| | | 8 | | 16 | 10 | 10 | 20 | 20 | 9 | 10 | 20 |
| | | 9 | | 16 | 10 | 10 | 19 | 20 | 9 | 8 | 20 |
| | | 10 | | 15 | 9 | 10 | 20 | 20 | 9 | 8 | 20 |
| | | 11 | | 15 | 9 | 10 | 20 | 20 | 9 | 8 | 20 |
| | | 12 | | 15 | 9 | 10 | 20 | 19 | 9 | 8 | 18 |
| | | 13 | | 15 | 9 | 10 | 20 | 19 | 9 | 8 | 17 |
| | | R1 | | 9 | - | - | 10 | 7 | - | - | 10 |
| | | R2 | | 9 | - | - | 10 | 7 | - | - | 10 |
| | | R3 | | 9 | - | - | 10 | 7 | - | - | 10 |
| | | R4 | | 10 | - | - | 10 | 7 | - | - | 10 |

TABLE 1 (cont) Signs - group distribution of observations

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Category | Observation | Week | Group/Sex: | Number of animals affected 1M | 2M | 3M | 4M | 1F | 2F | 3F | 4F |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Initial no: | 20 | 10 | 10 | 20 | 20 | 10 | 10 | 20 |
| Coat | Hair loss, Dorsal surface | 9 | | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | | 10 | | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | | 11 | | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | | 12 | | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| | | 13 | | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| | Hair loss, Forelimbs | 6 | | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| | | 7 | | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| | | 8 | | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| | | 9 | | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| | | 10 | | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| | | 11 | | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| | | 12 | | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| | | 13 | | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| | | R1 | | 0 | - | - | 0 | 2 | - | - | 0 |
| | | R2 | | 0 | - | - | 0 | 2 | - | - | 0 |
| | | R3 | | 0 | - | - | 0 | 2 | - | - | 0 |
| | | R4 | | 0 | - | - | 0 | 2 | - | - | 0 |

TABLE 1 (cont) Signs - group distribution of observations

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Category | Observation | Week | Group/Sex: | Number of animals affected | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1M | 2M | 3M | 4M | 1F | 2F | 3F | 4F |
| | | | Initial no: | 20 | 10 | 10 | 20 | 20 | 10 | 10 | 20 |
| Coat | Hair loss, Head | 5 | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 6 | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 7 | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 8 | | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 9 | | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | | 10 | | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | | 11 | | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | | 12 | | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | | 13 | | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | | R1 | | 1 | - | - | 0 | 0 | - | - | 0 |
| | | R2 | | 1 | - | - | 0 | 0 | - | - | 0 |
| | | R3 | | 1 | - | - | 0 | 0 | - | - | 0 |
| | Hair loss, Ventral surface | 8 | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 1 (cont) Signs - group distribution of observations

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Category | Observation | Week | Group/Sex: | 1M | 2M | 3M | 4M | 1F | 2F | 3F | 4F |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Number of animals affected | | | | | | | |
| | | | Initial no: | 20 | 10 | 10 | 20 | 20 | 10 | 10 | 20 |
| Skin | Encrustation, Head | 5 | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 6 | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 7 | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 8 | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 9 | | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 10 | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 11 | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 12 | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 13 | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | R2 | | 1 | - | - | 0 | 0 | - | - | 0 |
| | | R3 | | 1 | - | - | 0 | 0 | - | - | 0 |
| | Encrustation, Tail | 12 | | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| | | 13 | | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| | | R1 | | 0 | - | - | 0 | 1 | - | - | 0 |
| | | R2 | | 0 | - | - | 0 | 1 | - | - | 0 |
| | | R3 | | 0 | - | - | 0 | 1 | - | - | 0 |
| | | R4 | | 0 | - | - | 0 | 1 | - | - | 0 |
| | Encrustation, Upper ventral surface | 9 | | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Staining | Chromodacryorrhea | 13 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

TABLE 1 (cont) Signs - group distribution of observations

| Dose Group | Vehicle Control 1 | Gasoline Isobutanol Vapor Condensate 2 | 3 | 4 |
|---|---|---|---|---|
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Category | Observation | Week | Group/Sex: | 1M | 2M | 3M | 4M | 1F | 2F | 3F | 4F |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Initial no: | 20 | 10 | 10 | 20 | 20 | 10 | 10 | 20 |
| | | | | Number of animals affected | | | | | | | |
| Superficial mass | Firm, Perigenital | 12 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | | 13 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

TABLE 2 Body weight - group mean values (g)

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Week Ra3 | Week 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Statistics test | | Av | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi |
| 1M | Mean | 153 | 207 | 256 | 300 | 337 | 366 | 395 | 415 | 433 | 450 | 464 | 479 |
| | SD | 16.7 | 20.0 | 22.8 | 28.6 | 28.7 | 31.5 | 35.7 | 36.8 | 37.2 | 39.7 | 41.2 | 45.2 |
| | N | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| 2M | Mean | 156 | 216 | 266 | 309 | 345 | 364 | 397 | 418 | 431 | 453 | 464 | 478 |
| | SD | 8.4 | 14.3 | 17.4 | 23.3 | 28.2 | 28.1 | 32.9 | 33.7 | 36.3 | 39.6 | 39.6 | 40.7 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3M | Mean | 161 | 219 | 270 | 312 | 349 | 375 | 404 | 431 | 448 | 466 | 480 | 495 |
| | SD | 10.0 | 15.8 | 21.8 | 28.3 | 33.8 | 38.4 | 43.1 | 45.7 | 50.2 | 50.5 | 52.4 | 53.2 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | 151 | 205 | 252 | 293 | 328 | 357 | 381 | 401 | 412 | 433 | 445 | 459 |
| | SD | 13.9 | 19.2 | 24.1 | 26.7 | 31.2 | 32.9 | 35.7 | 38.5 | 40.2 | 44.0 | 47.2 | 48.7 |
| | N | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |

TABLE 2 (cont) Body weight - group mean values (g)

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Week 12 | 13 | Week R1 | R2 | R3 | R4 | Change Ra3-1 | Change Ra3-2 | Change Ra3-3 | Change Ra3-4 | Change Ra3-5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Statistics test | | Wi | Wi | Tt | Tt | Tt | Tt | Du | Wi | Wi | Wi | Wi |
| 1M | Mean | 487 | 495 | 512 | 518 | 527 | 540 | 55 | 104 | 147 | 185 | 213 |
| | SD | 48.0 | 49.2 | 45.6 | 47.0 | 48.6 | 48.4 | 6.1 | 10.5 | 17.1 | 18.7 | 21.0 |
| | N | 20 | 20 | 10 | 10 | 10 | 10 | 20 | 20 | 20 | 20 | 20 |
| 2M | Mean | 489 | 491 | | | | | 60 | 111 | 154 | 190 | 208 |
| | SD | 45.3 | 46.5 | | | | | 6.7 | 10.3 | 17.5 | 22.9 | 23.0 |
| | N | 10 | 10 | | | | | 10 | 10 | 10 | 10 | 10 |
| 3M | Mean | 506 | 513 | | | | | 58 | 109 | 151 | 188 | 214 |
| | SD | 53.6 | 56.6 | | | | | 6.9 | 13.9 | 21.0 | 28.0 | 33.2 |
| | N | 10 | 10 | | | | | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | 470 | 475 | 474 | 484 | 496 | 512 | 54 | 102 | 142 | 177 | 206 |
| | SD | 50.2 | 50.2 | 49.8 | 51.9 | 54.1 | 58.0 | 6.2 | 11.7 | 15.6 | 20.4 | 22.8 |
| | N | 20 | 20 | 10 | 10 | 10 | 10 | 20 | 20 | 20 | 20 | 20 |

TABLE 2 (cont) Body weight - group mean values (g)

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Change Ra3-6 | Change Ra3-7 | Change Ra3-8 | Change Ra3-9 | Change Ra3-10 | Change Ra3-11 | Change Ra3-12 | Change Ra3-13 | Change Ra3-R1 | Change Ra3-R2 | Change Ra3-R3 | Change Ra3-R4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Statistics test | | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Tt | Tt | Tt | Tt |
| 1M | Mean | 242 | 263 | 280 | 297 | 312 | 326 | 335 | 342 | 358 | 364 | 374 | 387 |
| | SD | 25.0 | 26.4 | 27.5 | 29.6 | 31.6 | 35.3 | 38.4 | 39.1 | 37.0 | 38.5 | 40.3 | 40.2 |
| | N | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 10 | 10 | 10 | 10 |
| 2M | Mean | 242 | 262 | 275 | 298 | 309 | 323 | 333 | 335 | | | | |
| | SD | 27.8 | 28.7 | 31.6 | 35.6 | 35.5 | 37.0 | 41.8 | 43.0 | | | | |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | | | | |
| 3M | Mean | 243 | 270 | 287 | 305 | 319 | 334 | 345 | 352 | | | | |
| | SD | 38.2 | 41.3 | 45.6 | 46.4 | 49.0 | 49.7 | 50.1 | 52.9 | | | | |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | | | | |
| 4M | Mean | 231 | 250 | 261 | 282 | 295 | 308 | 319 | 324 | 329 | 339 | 352 | 367 |
| | SD | 26.6 | 29.4 | 31.9 | 35.8 | 39.7 | 40.9 | 42.5 | 42.8 | 47.2 | 49.4 | 51.2 | 55.2 |
| | N | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 10 | 10 | 10 | 10 |

TABLE 2 (cont) Body weight - group mean values (g)

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Week Ra3 | Week 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Statistics | test | Av | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi |
| 1F | Mean | 139 | 169 | 197 | 214 | 230 | 240 | 253 | 259 | 271 | 275 | 276 | 288 |
| | SD | 7.8 | 8.7 | 10.3 | 13.2 | 13.9 | 14.3 | 14.6 | 16.7 | 17.8 | 17.5 | 16.5 | 18.7 |
| | N | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| 2F | Mean | 139 | 170 | 195 | 213 | 231 | 236 | 249 | 258 | 269 | 272 | 273 | 284 |
| | SD | 9.7 | 7.8 | 9.2 | 7.3 | 6.5 | 9.0 | 8.8 | 7.6 | 8.3 | 9.1 | 9.4 | 8.5 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3F | Mean | 144 | 174 | 203 | 220 | 234 | 242 | 257 | 263 | 276 | 281 | 283 | 292 |
| | SD | 7.7 | 8.5 | 6.3 | 9.8 | 10.4 | 9.7 | 11.3 | 13.5 | 12.1 | 14.5 | 13.2 | 13.6 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4F | Mean | 139 | 168 | 194 | 208 | 224 | 234 | 246 | 254 | 261* | 268 | 272 | 280 |
| | SD | 10.9 | 12.6 | 13.2 | 16.7 | 17.0 | 17.3 | 16.9 | 19.0 | 18.4 | 17.8 | 18.9 | 20.4 |
| | N | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |

TABLE 2 (cont) Body weight - group mean values (g)

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Week 12 | 13 | Week R1 | R2 | R3 | R4 | Change Ra3-1 | Change Ra3-2 | Change Ra3-3 | Change Ra3-4 | Change Ra3-5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Statistics test | | Wi | Wi | Tt | Tt | Tt | Tt | Wi | Wi | Wi | Wi | Wi |
| 1F | Mean | 291 | 293 | 308 | 317 | 315 | 319 | 30 | 58 | 75 | 91 | 101 |
| | SD | 19.9 | 19.7 | 23.3 | 24.5 | 24.2 | 24.8 | 6.8 | 6.9 | 9.6 | 9.9 | 10.1 |
| | N | 20 | 20 | 10 | 10 | 10 | 10 | 20 | 20 | 20 | 20 | 20 |
| 2F | Mean | 287 | 286 | | | | | 31 | 57 | 74 | 92 | 97 |
| | SD | 8.3 | 10.7 | | | | | 5.1 | 5.9 | 7.2 | 6.3 | 7.5 |
| | N | 10 | 10 | | | | | 10 | 10 | 10 | 10 | 10 |
| 3F | Mean | 295 | 296 | | | | | 31 | 59 | 76 | 90 | 98 |
| | SD | 16.5 | 15.3 | | | | | 3.6 | 4.9 | 7.6 | 8.4 | 9.0 |
| | N | 10 | 10 | | | | | 10 | 10 | 10 | 10 | 10 |
| 4F | Mean | 282 | 284 | 299 | 307 | 305 | 311 | 29 | 55 | 69 | 85* | 95 |
| | SD | 20.6 | 20.0 | 19.2 | 22.9 | 22.8 | 22.3 | 3.7 | 6.6 | 8.8 | 9.3 | 10.7 |
| | N | 20 | 20 | 10 | 10 | 10 | 10 | 20 | 20 | 20 | 20 | 20 |

TABLE 2 (cont) Body weight - group mean values (g)

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Change Ra3-6 | Change Ra3-7 | Change Ra3-8 | Change Ra3-9 | Change Ra3-10 | Change Ra3-11 | Change Ra3-12 | Change Ra3-13 | Change Ra3-R1 | Change Ra3-R2 | Change Ra3-R3 | Change Ra3-R4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Statistics test | | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Tt | Tt | Tt | Tt |
| 1F | Mean | 114 | 120 | 133 | 136 | 137 | 149 | 152 | 155 | 166 | 175 | 173 | 177 |
| | SD | 10.5 | 12.8 | 14.2 | 13.3 | 12.8 | 14.1 | 15.6 | 15.8 | 18.6 | 20.4 | 20.4 | 20.8 |
| | N | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 10 | 10 | 10 | 10 |
| 2F | Mean | 110 | 120 | 130 | 133 | 134 | 145 | 148 | 147 | | | | |
| | SD | 8.6 | 7.9 | 6.8 | 9.0 | 7.0 | 7.5 | 5.4 | 9.7 | | | | |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | | | | |
| 3F | Mean | 113 | 120 | 132 | 137 | 139 | 148 | 151 | 152 | | | | |
| | SD | 11.1 | 13.3 | 12.0 | 14.3 | 14.1 | 14.3 | 16.7 | 15.9 | | | | |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | | | | |
| 4F | Mean | 107* | 115 | 122** | 129 | 133 | 141 | 143 | 145 | 161 | 169 | 167 | 173 |
| | SD | 10.8 | 12.5 | 12.1 | 11.5 | 12.8 | 14.1 | 14.7 | 14.2 | 13.8 | 17.0 | 17.7 | 16.5 |
| | N | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 10 | 10 | 10 | 10 |

TABLE 3 Body weight change - group mean values (g)

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Week Ra3-1 | Week 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | Week R1-R2 | R2-R3 | R3-R4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Statistics test | | Du | Du | Wi | Wi | Wi | Wi | Wi | Wi | Tt | Tt | Tt |
| 1M | Mean | 55 | 20 | 17 | 17 | 14 | 15 | 9 | 7 | 6 | 9 | 13 |
| | SD | 6.1 | 6.0 | 5.0 | 5.8 | 5.3 | 7.0 | 6.1 | 5.9 | 3.1 | 3.4 | 2.9 |
| | N | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 10 | 10 | 10 |
| 2M | Mean | 60 | 21 | 13 | 23 | 11 | 14 | 10 | 2 | | | |
| | SD | 6.7 | 6.0 | 8.4 | 8.0 | 8.9 | 4.9 | 7.0 | 3.4 | | | |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | | | |
| 3M | Mean | 58 | 27** | 16 | 18 | 14 | 15 | 11 | 7 | | | |
| | SD | 6.9 | 4.9 | 5.3 | 4.5 | 7.1 | 4.0 | 3.0 | 4.4 | | | |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | | | |
| 4M | Mean | 54 | 19 | 11** | 21 | 13 | 13 | 11 | 5 | 10** | 13 | 15 |
| | SD | 6.2 | 4.7 | 6.9 | 6.4 | 7.7 | 6.0 | 5.7 | 3.4 | 2.8 | 3.9 | 5.7 |
| | N | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 10 | 10 | 10 |

TABLE 3 (cont) Body weight change - group mean values (g)

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Week Ra3-1 | Week 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | Week R1-R2 | R2-R3 | R3-R4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Statistics test | | Wi | Wi | Wi | Wi | Wi | Sh | Wi | Wi | Tt | Tt | Tt |
| 1F | Mean | 30 | 6 | 12 | 3 | 1 | 12 | 3 | 2 | 9 | -2 | 4 |
| | SD | 6.8 | 5.9 | 4.8 | 6.1 | 4.4 | 5.4 | 4.9 | 4.9 | 5.3 | 2.7 | 5.5 |
| | N | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 10 | 10 | 10 |
| 2F | Mean | 31 | 9 | 11 | 3 | 1 | 11 | 3 | -1 | | | |
| | SD | 5.1 | 2.8 | 4.3 | 4.1 | 3.1 | 2.1 | 4.6 | 4.6 | | | |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | | | |
| 3F | Mean | 31 | 6 | 12 | 5 | 2 | 9* | 3 | 1 | | | |
| | SD | 3.6 | 4.5 | 4.8 | 5.2 | 3.7 | 2.6 | 4.7 | 3.4 | | | |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | | | |
| 4F | Mean | 29 | 8 | 7** | 7* | 4 | 8* | 2 | 2 | 8 | -2 | 6 |
| | SD | 3.7 | 4.2 | 3.0 | 3.6 | 5.1 | 5.2 | 5.2 | 3.6 | 7.8 | 6.4 | 6.5 |
| | N | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 10 | 10 | 10 |

TABLE 4 Food consumption - group mean values (g/animal/day)

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Week Ra2 | Week 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Statistics | test | Av | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi |
| 1M | Mean | 22 | 23 | 24 | 26 | 25 | 27 | 25 | 25 | 26 | 25 | 25 | 26 |
| | SD | 1.5 | 1.7 | 2.4 | 1.3 | 1.7 | 2.2 | 1.5 | 1.7 | 1.6 | 1.8 | 2.1 | 2.0 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2M | Mean | 23 | 24 | 26 | 26 | 24 | 28 | 27 | 27 | 28 | 26 | 26 | 27 |
| | SD | 1.7 | 1.5 | 2.5 | 2.7 | 2.6 | 1.9 | 2.4 | 2.5 | 2.5 | 2.4 | 2.0 | 2.3 |
| | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 3M | Mean | 23 | 24 | 25 | 26 | 24 | 28 | 28 | 28 | 28 | 27 | 27 | 28 |
| | SD | 1.8 | 1.6 | 2.0 | 2.6 | 2.4 | 2.4 | 2.7 | 2.9 | 2.7 | 2.9 | 2.6 | 2.4 |
| | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 4M | Mean | 22 | 22 | 24 | 25 | 24 | 26 | 25 | 25 | 26 | 25 | 25 | 26 |
| | SD | 1.8 | 1.6 | 1.8 | 1.9 | 2.0 | 1.9 | 2.0 | 1.9 | 2.1 | 1.9 | 2.1 | 2.2 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 9 | 10 | 10 | 10 | 10 |

TABLE 4 (cont) Food consumption - group mean values (g/animal/day)

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Week 12 | 13 | Week R1 | R2 | R3 | R4 |
|---|---|---|---|---|---|---|---|
| Statistics test | | Wi | Wi | Tt | Tt | Tt | Tt |
| 1M | Mean | 25 | 25 | 24 | 23 | 22 | 26 |
| | SD | 2.2 | 1.9 | 1.5 | 1.7 | 1.8 | 7.8 |
| | N | 10 | 10 | 5 | 5 | 5 | 5 |
| 2M | Mean | 26 | 25 | | | | |
| | SD | 3.0 | 3.1 | | | | |
| | N | 5 | 5 | | | | |
| 3M | Mean | 27 | 26 | | | | |
| | SD | 2.6 | 2.7 | | | | |
| | N | 5 | 5 | | | | |
| 4M | Mean | 25 | 25 | 24 | 24 | 23 | 24 |
| | SD | 2.8 | 2.2 | 2.9 | 3.0 | 2.6 | 2.9 |
| | N | 10 | 10 | 5 | 5 | 5 | 5 |

TABLE 4 (cont) Food consumption - group mean values (g/animal/day)

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Week Ra2 | Week 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Statistics test | | Av | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi |
| 1F | Mean | 18 | 18 | 18 | 20 | 19 | 21 | 19 | 20 | 19 | 19 | 20 | 20 |
| | SD | 0.7 | 0.6 | 1.2 | 1.5 | 1.4 | 0.9 | 1.1 | 1.3 | 1.0 | 1.1 | 1.0 | 1.2 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2F | Mean | 18 | 19 | 19 | 21 | 18 | 22 | 20 | 21 | 20 | 20 | 20 | 20 |
| | SD | 1.1 | 1.3 | 1.1 | 0.7 | 0.5 | 0.4 | 0.7 | 0.5 | 1.0 | 0.8 | 1.0 | 0.7 |
| | N | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 3F | Mean | 18 | 18 | 19 | 20 | 18 | 21 | 21 | 20 | 20 | 20 | 20 | 20 |
| | SD | 0.4 | 0.8 | 1.1 | 1.4 | 0.9 | 1.2 | 1.6 | 1.3 | 0.9 | 1.2 | 0.9 | 1.2 |
| | N | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 4 | 4 | 5 | 5 |
| 4F | Mean | 17 | 17* | 18 | 19 | 18* | 20 | 19 | 19 | 19 | 19 | 19 | 19 |
| | SD | 1.0 | 1.8 | 1.6 | 1.2 | 1.5 | 1.8 | 1.4 | 1.3 | 1.1 | 1.3 | 1.3 | 1.2 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 4 (cont) Food consumption - group mean values (g/animal/day)

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Week 12 | 13 | Week R1 | R2 | R3 | R4 |
|---|---|---|---|---|---|---|---|
| Statistics test | | Wi | Wi | Tt | Tt | Tt | Tt |
| 1F | Mean | 18 | 19 | 18 | 18 | 17 | 18 |
| | SD | 1.1 | 1.2 | 0.6 | 0.7 | 0.7 | 0.8 |
| | N | 10 | 10 | 5 | 5 | 5 | 5 |
| 2F | Mean | 18 | 19 | | | | |
| | SD | 1.3 | 1.7 | | | | |
| | N | 5 | 5 | | | | |
| 3F | Mean | 18 | 19 | | | | |
| | SD | 1.0 | 1.0 | | | | |
| | N | 5 | 5 | | | | |
| 4F | Mean | 18 | 19 | 18 | 19 | 18 | 18 |
| | SD | 2.0 | 1.6 | 1.5 | 1.6 | 1.6 | 1.2 |
| | N | 10 | 10 | 5 | 5 | 5 | 5 |

TABLE 5 Motor activity - group mean values (number of beam breaks) – pretest horizontal

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | Mean | 701.5 | 232.5 | 203.3 | 171.3 | 164.0 | 76.6 | 17.6 | 38.0 | 60.5 | 48.2 | 74.4 | 66.7 |
| | SD | 84.65 | 132.26 | 143.41 | 112.75 | 98.00 | 103.20 | 22.63 | 69.51 | 95.90 | 47.33 | 108.81 | 66.55 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2M | Mean | 655.2 | 251.2 | 148.3 | 128.9 | 120.3 | 80.8 | 40.7 | 47.7 | 54.3 | 48.8 | 49.5 | 23.4 |
| | SD | 133.27 | 130.37 | 145.40 | 121.75 | 115.48 | 102.96 | 21.23 | 66.31 | 96.48 | 78.25 | 41.48 | 14.99 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3M | Mean | 738.3 | 250.3 | 210.5 | 152.1 | 54.8 | 41.1 | 23.1 | 30.4 | 41.3 | 37.8 | 61.4 | 43.4 |
| | SD | 104.68 | 95.76 | 130.61 | 156.03 | 53.41 | 37.23 | 12.15 | 26.29 | 26.20 | 25.26 | 64.28 | 37.72 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | 666.0 | 313.8 | 203.2 | 192.8 | 119.9 | 88.5 | 57.7 | 60.8 | 78.1 | 64.7 | 44.5 | 38.0 |
| | SD | 81.22 | 111.90 | 107.26 | 129.96 | 71.83 | 88.46 | 34.18 | 82.16 | 58.21 | 60.82 | 43.63 | 38.11 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 5 (cont) Motor activity - group mean values (number of beam breaks) – pretest horizontal

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | Mean | 676.5 | 259.0 | 159.3 | 91.1 | 76.9 | 52.4 | 81.4 | 99.3 | 55.9 | 30.1 | 54.6 | 26.2 |
| | SD | 151.33 | 189.99 | 142.36 | 111.00 | 98.80 | 59.86 | 110.30 | 136.18 | 85.12 | 28.45 | 81.20 | 24.97 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2F | Mean | 670.8 | 328.4 | 89.1 | 108.8 | 100.7 | 95.6 | 42.8 | 81.9 | 70.6 | 55.0 | 78.3 | 58.6 |
| | SD | 104.45 | 184.33 | 52.04 | 141.19 | 68.64 | 114.51 | 41.51 | 135.65 | 84.19 | 80.39 | 114.85 | 102.56 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3F | Mean | 680.2 | 319.6 | 205.9 | 159.9 | 82.3 | 78.4 | 43.8 | 58.8 | 47.0 | 41.8 | 44.5 | 28.1 |
| | SD | 112.12 | 122.60 | 126.72 | 136.15 | 96.85 | 113.12 | 47.48 | 74.09 | 75.65 | 38.37 | 38.47 | 29.57 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4F | Mean | 623.5 | 321.9 | 201.6 | 119.5 | 49.5 | 45.9 | 57.1 | 42.8 | 90.8 | 103.1 | 25.4 | 48.2 |
| | SD | 95.71 | 82.43 | 89.44 | 123.64 | 46.56 | 92.23 | 116.50 | 49.33 | 121.23 | 124.16 | 29.42 | 45.02 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 5 (cont) Motor activity - group mean values (number of beam breaks) - pretest vertical

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | Mean | 39.9 | 9.8 | 9.9 | 7.1 | 3.5 | 1.3 | 0.0 | 0.0 | 0.6 | 0.0 | 1.2 | 1.2 |
| | SD | 18.17 | 13.26 | 11.11 | 8.28 | 6.87 | 3.77 | 0.00 | 0.00 | 1.90 | 0.00 | 3.79 | 3.46 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2M | Mean | 35.6 | 11.0 | 5.1 | 4.5 | 2.9 | 2.1 | 0.0 | 1.2 | 1.1 | 1.7 | 0.5 | 0.0 |
| | SD | 12.17 | 7.53 | 7.72 | 6.65 | 4.98 | 5.97 | 0.00 | 2.90 | 2.85 | 5.38 | 1.58 | 0.00 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3M | Mean | 45.3 | 7.9 | 8.1 | 6.2 | 0.5 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 |
| | SD | 17.52 | 6.44 | 10.54 | 12.95 | 1.58 | 1.58 | 0.00 | 0.00 | 0.00 | 0.00 | 0.63 | 0.00 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | 42.1 | 16.9 | 8.3 | 8.2 | 1.5 | 2.0 | 0.4 | 1.3 | 0.2 | 0.5 | 0.0 | 0.0 |
| | SD | 10.18 | 10.71 | 7.04 | 10.14 | 3.41 | 6.32 | 1.26 | 3.77 | 0.42 | 1.58 | 0.00 | 0.00 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 5 (cont) Motor activity - group mean values (number of beam breaks) – pretest vertical

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | Mean | 32.1 | 13.9 | 6.8 | 3.3 | 3.2 | 1.1 | 3.2 | 4.9 | 1.2 | 0.0 | 1.1 | 0.0 |
| | SD | 18.42 | 14.77 | 10.65 | 6.72 | 8.11 | 2.42 | 7.30 | 9.83 | 3.79 | 0.00 | 3.48 | 0.00 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2F | Mean | 37.5 | 20.8 | 2.0 | 8.2 | 4.0 | 5.0 | 0.1 | 5.4 | 3.4 | 0.5 | 1.1 | 2.4 |
| | SD | 16.24 | 19.75 | 2.83 | 14.77 | 5.12 | 8.11 | 0.32 | 14.49 | 8.58 | 1.58 | 3.48 | 7.59 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3F | Mean | 33.6 | 13.0 | 7.5 | 6.5 | 0.5 | 1.5 | 0.1 | 1.3 | 0.2 | 0.1 | 0.1 | 0.0 |
| | SD | 12.40 | 10.61 | 7.38 | 8.10 | 1.27 | 2.59 | 0.32 | 3.77 | 0.63 | 0.32 | 0.32 | 0.00 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4F | Mean | 33.2 | 17.2 | 7.8 | 6.8 | 0.4 | 2.5 | 3.6 | 0.1 | 1.8 | 2.3 | 0.0 | 0.3 |
| | SD | 15.57 | 9.31 | 9.62 | 13.25 | 1.26 | 7.91 | 8.93 | 0.32 | 5.03 | 4.57 | 0.00 | 0.95 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 5 (cont) Motor activity - group mean values (number of beam breaks) - week 4 horizontal

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | Mean | 692.3 | 408.3 | 273.2 | 139.6 | 116.0 | 59.5 | 42.2 | 95.5 | 73.3 | 37.5 | 13.9 | 12.8 |
| | SD | 86.72 | 109.27 | 141.71 | 100.89 | 91.26 | 46.99 | 42.12 | 143.02 | 99.57 | 41.00 | 10.85 | 14.45 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2M | Mean | 640.1 | 414.6 | 281.5 | 191.9 | 100.9 | 37.3 | 37.8 | 15.6 | 11.1 | 22.0 | 46.1 | 34.4 |
| | SD | 151.09 | 109.03 | 111.08 | 100.87 | 73.11 | 33.51 | 43.53 | 17.73 | 11.10 | 36.51 | 78.78 | 54.52 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3M | Mean | 683.8 | 425.6 | 311.5 | 279.4 | 151.1 | 117.3 | 87.3 | 67.3 | 30.3 | 21.1 | 24.0 | 34.3 |
| | SD | 126.13 | 102.25 | 119.30 | 78.91 | 77.67 | 111.16 | 86.54 | 99.19 | 39.44 | 29.27 | 24.87 | 62.54 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | 650.0 | 391.3 | 388.3 | 289.2 | 201.0 | 195.0 | 107.5 | 87.4 | 25.0 | 9.4 | 30.5 | 43.2 |
| | SD | 115.89 | 66.69 | 124.34 | 120.94 | 127.28 | 115.41 | 71.05 | 105.67 | 37.51 | 16.83 | 24.81 | 62.33 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 5 (cont) Motor activity - group mean values (number of beam breaks) - week 4 horizontal

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | Mean | 778.2 | 537.4 | 333.2 | 223.0 | 211.3 | 92.4 | 116.4 | 92.7 | 45.8 | 70.5 | 47.3 | 17.7 |
| | SD | 145.99 | 169.90 | 201.06 | 133.28 | 131.94 | 60.25 | 189.28 | 184.34 | 78.36 | 105.45 | 75.33 | 15.64 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2F | Mean | 803.5 | 474.2 | 271.4 | 231.1 | 94.8 | 75.8 | 89.8 | 36.5 | 49.7 | 40.0 | 73.4 | 55.5 |
| | SD | 81.25 | 84.14 | 121.02 | 135.25 | 101.66 | 78.89 | 143.06 | 39.84 | 68.76 | 90.62 | 121.75 | 81.23 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3F | Mean | 792.0 | 495.0 | 329.8 | 310.1 | 132.5 | 85.5 | 97.0 | 55.5 | 72.3 | 44.3 | 54.1 | 74.0 |
| | SD | 176.44 | 141.92 | 209.22 | 219.79 | 137.96 | 162.79 | 220.52 | 148.77 | 187.90 | 86.30 | 137.28 | 157.05 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4F | Mean | 707.9 | 411.0 | 228.6 | 279.6 | 124.6 | 96.9 | 74.0 | 47.8 | 57.3 | 60.4 | 17.0 | 15.9 |
| | SD | 118.51 | 123.69 | 104.10 | 168.31 | 101.75 | 96.73 | 96.14 | 42.63 | 129.17 | 105.50 | 24.40 | 21.11 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 5 (cont) Motor activity - group mean values (number of beam breaks) - week 4 vertical

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | Mean | 47.5 | 22.8 | 11.5 | 5.4 | 3.9 | 0.6 | 0.4 | 2.9 | 0.8 | 0.5 | 0.0 | 0.2 |
| | SD | 11.37 | 8.28 | 8.71 | 5.85 | 5.65 | 1.35 | 1.26 | 6.23 | 2.20 | 1.58 | 0.00 | 0.63 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2M | Mean | 41.7 | 24.2 | 11.5 | 6.7 | 2.2 | 0.2 | 0.5 | 0.0 | 0.0 | 0.0 | 1.0 | 0.4 |
| | SD | 19.22 | 11.05 | 7.72 | 8.27 | 3.58 | 0.63 | 1.08 | 0.00 | 0.00 | 0.00 | 3.16 | 0.84 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3M | Mean | 39.8 | 20.9 | 10.1 | 11.3 | 3.6 | 3.3 | 1.5 | 1.5 | 0.1 | 0.0 | 0.1 | 0.5 |
| | SD | 5.20 | 9.48 | 7.48 | 5.91 | 4.03 | 5.81 | 2.59 | 4.09 | 0.32 | 0.00 | 0.32 | 1.58 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | 39.3 | 19.0 | 19.2 | 11.6 | 6.3 | 8.7 | 2.5 | 2.4 | 0.4 | 0.0 | 0.9 | 1.0 |
| | SD | 6.29 | 6.06 | 7.66 | 9.05 | 7.24 | 9.70 | 3.03 | 4.22 | 1.26 | 0.00 | 2.23 | 2.00 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 5 (cont) Motor activity - group mean values (number of beam breaks) - week 4 vertical

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | Mean | 43.5 | 24.0 | 13.1 | 9.5 | 7.5 | 1.6 | 3.3 | 1.5 | 0.4 | 0.9 | 1.5 | 0.0 |
| | SD | 12.37 | 7.63 | 10.16 | 9.34 | 5.32 | 3.78 | 8.82 | 3.81 | 1.26 | 2.85 | 3.81 | 0.00 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2F | Mean | 49.0 | 29.8 | 11.0 | 9.9 | 1.8 | 2.8 | 3.6 | 0.2 | 0.9 | 2.4 | 3.3 | 0.7 |
| | SD | 15.92 | 8.74 | 8.78 | 11.25 | 4.47 | 5.75 | 9.12 | 0.42 | 2.85 | 7.59 | 7.15 | 1.89 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3F | Mean | 44.5 | 26.7 | 12.1 | 13.8 | 3.2 | 2.8 | 6.4 | 3.2 | 3.0 | 1.4 | 1.5 | 2.3 |
| | SD | 14.07 | 11.42 | 10.13 | 12.44 | 6.37 | 7.83 | 18.88 | 10.12 | 9.49 | 4.43 | 4.74 | 7.27 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4F | Mean | 38.2 | 21.1 | 10.5 | 15.0 | 2.7 | 3.8 | 2.3 | 0.4 | 2.5 | 1.5 | 0.2 | 0.0 |
| | SD | 10.41 | 8.62 | 8.46 | 10.87 | 2.63 | 6.71 | 4.62 | 0.97 | 6.62 | 3.17 | 0.63 | 0.00 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 5 (cont) Motor activity - group mean values (number of beam breaks) - week 8 horizontal

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | Mean | 619.5 | 366.4 | 207.2 | 123.3 | 35.5 | 49.0 | 50.3 | 16.6 | 11.7 | 9.7 | 12.9 | 14.5 |
| | SD | 91.32 | 35.95 | 97.72 | 60.16 | 26.18 | 72.51 | 70.91 | 20.14 | 18.43 | 8.97 | 11.65 | 39.92 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2M | Mean | 666.8 | 367.3 | 195.7 | 205.9 | 89.6 | 37.5 | 23.9 | 33.3 | 43.1 | 38.8 | 53.5 | 26.5 |
| | SD | 131.45 | 151.19 | 117.77 | 128.13 | 59.71 | 43.84 | 42.47 | 60.34 | 74.88 | 102.02 | 116.84 | 29.97 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3M | Mean | 641.8 | 359.3 | 199.3 | 116.7 | 63.0 | 30.3 | 53.2 | 20.4 | 50.8 | 41.5 | 5.3 | 10.9 |
| | SD | 142.03 | 115.83 | 123.45 | 81.44 | 79.99 | 30.75 | 113.39 | 22.42 | 71.36 | 91.37 | 5.95 | 10.27 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | 627.6 | 348.2 | 152.8 | 177.3 | 76.8 | 30.3 | 58.2 | 89.4 | 33.1 | 35.4 | 13.8 | 44.4 |
| | SD | 118.71 | 126.06 | 76.55 | 136.80 | 76.04 | 35.11 | 70.31 | 115.91 | 32.14 | 62.07 | 13.21 | 81.22 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 5 (cont) Motor activity - group mean values (number of beam breaks) - week 8 horizontal

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | Mean | 717.0 | 449.0 | 219.5 | 135.5 | 140.0 | 52.1 | 31.2 | 12.5 | 51.1 | 65.0 | 11.3 | 59.2 |
| | SD | 85.41 | 130.51 | 146.22 | 102.21 | 154.77 | 58.27 | 37.64 | 13.68 | 75.79 | 86.19 | 8.72 | 115.73 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2F | Mean | 752.8 | 437.4 | 209.3 | 177.8 | 83.2 | 36.0 | 39.8 | 18.8 | 22.4 | 9.3 | 46.6 | 74.3 |
| | SD | 100.56 | 78.61 | 83.68 | 157.70 | 96.33 | 55.62 | 52.48 | 31.56 | 16.55 | 8.96 | 83.33 | 108.97 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3F | Mean | 754.3 | 416.5 | 197.5 | 118.2 | 51.9 | 112.6 | 80.6 | 30.2 | 41.9 | 17.1 | 37.9 | 39.1 |
| | SD | 91.76 | 140.10 | 108.48 | 182.01 | 73.57 | 114.34 | 64.43 | 39.00 | 107.67 | 26.81 | 73.47 | 78.78 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4F | Mean | 635.2 | 354.4 | 236.9 | 115.8 | 88.2 | 64.0 | 65.5 | 37.9 | 61.9 | 80.8 | 36.4 | 12.7 |
| | SD | 121.41 | 145.95 | 148.61 | 108.15 | 98.73 | 80.75 | 149.99 | 49.88 | 147.61 | 123.55 | 61.16 | 16.35 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 5 (cont) Motor activity - group mean values (number of beam breaks) - week 8 vertical

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | Mean | 30.8 | 17.0 | 6.4 | 2.2 | 0.1 | 0.8 | 0.8 | 0.0 | 0.0 | 0.1 | 0.1 | 0.6 |
| | SD | 5.53 | 3.46 | 5.93 | 3.68 | 0.32 | 2.53 | 2.20 | 0.00 | 0.00 | 0.32 | 0.32 | 1.90 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2M | Mean | 37.9 | 18.1 | 7.5 | 7.1 | 1.2 | 0.3 | 0.1 | 1.0 | 0.8 | 1.0 | 1.5 | 0.2 |
| | SD | 13.36 | 9.71 | 5.40 | 6.44 | 1.23 | 0.95 | 0.32 | 3.16 | 2.53 | 3.16 | 4.74 | 0.63 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3M | Mean | 31.7 | 12.0 | 5.9 | 1.7 | 0.6 | 0.1 | 1.8 | 0.1 | 0.8 | 0.9 | 0.0 | 0.0 |
| | SD | 11.47 | 6.32 | 7.80 | 2.95 | 1.58 | 0.32 | 5.35 | 0.32 | 2.53 | 2.85 | 0.00 | 0.00 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | 29.8 | 13.1 | 3.7 | 6.1 | 1.6 | 0.1 | 0.8 | 3.0 | 0.1 | 0.1 | 0.1 | 1.2 |
| | SD | 6.11 | 6.67 | 3.80 | 6.24 | 4.03 | 0.32 | 1.23 | 4.47 | 0.32 | 0.32 | 0.32 | 3.46 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 5 (cont) Motor activity - group mean values (number of beam breaks) - week 8 vertical

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | Mean | 35.5 | 22.0 | 8.0 | 3.7 | 4.4 | 1.9 | 0.7 | 0.0 | 2.2 | 1.1 | 0.0 | 1.8 |
| | SD | 7.82 | 12.46 | 9.97 | 5.01 | 6.31 | 3.73 | 1.49 | 0.00 | 4.44 | 2.85 | 0.00 | 4.47 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2F | Mean | 37.9 | 20.1 | 9.1 | 7.0 | 1.9 | 1.1 | 1.1 | 0.0 | 0.0 | 0.0 | 0.9 | 1.8 |
| | SD | 12.04 | 6.71 | 8.71 | 7.92 | 3.18 | 2.81 | 2.85 | 0.00 | 0.00 | 0.00 | 2.85 | 3.36 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3F | Mean | 38.4 | 17.5 | 4.8 | 3.8 | 1.4 | 4.9 | 1.1 | 0.3 | 1.1 | 0.3 | 1.0 | 1.2 |
| | SD | 8.98 | 8.75 | 4.57 | 7.57 | 2.80 | 7.71 | 1.79 | 0.95 | 3.48 | 0.95 | 3.16 | 3.79 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4F | Mean | 32.7 | 14.2 | 8.6 | 3.3 | 2.8 | 1.9 | 2.3 | 0.6 | 2.7 | 1.0 | 0.4 | 0.0 |
| | SD | 10.66 | 8.04 | 7.24 | 5.27 | 5.29 | 3.18 | 6.93 | 1.90 | 8.54 | 2.21 | 1.26 | 0.00 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 5 (cont) Motor activity - group mean values (number of beam breaks) - week 13 horizontal

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | Mean | 599.3 | 345.6 | 206.5 | 42.8 | 24.4 | 22.9 | 17.4 | 19.2 | 17.4 | 10.1 | 24.0 | 24.2 |
| | SD | 95.58 | 108.59 | 162.69 | 32.68 | 47.13 | 30.36 | 23.03 | 21.87 | 28.48 | 8.46 | 37.20 | 45.47 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2M | Mean | 579.8 | 284.3 | 117.6 | 63.1 | 51.4 | 18.2 | 46.3 | 25.5 | 11.4 | 9.2 | 28.9 | 60.0 |
| | SD | 139.01 | 130.32 | 72.11 | 42.58 | 51.73 | 23.70 | 59.27 | 20.01 | 17.61 | 18.55 | 59.13 | 103.01 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3M | Mean | 644.8 | 385.8 | 159.9 | 111.8 | 29.9 | 34.7 | 25.7 | 15.1 | 5.2 | 28.4 | 36.3 | 11.8 |
| | SD | 46.84 | 112.30 | 65.42 | 120.99 | 24.79 | 31.44 | 45.04 | 11.66 | 5.59 | 50.43 | 56.28 | 16.79 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | 581.1 | 306.7 | 166.4 | 72.4 | 26.9 | 32.3 | 22.7 | 25.7 | 53.8 | 12.8 | 18.1 | 71.9 |
| | SD | 102.97 | 149.12 | 166.73 | 95.66 | 24.66 | 41.42 | 30.65 | 49.68 | 82.33 | 17.05 | 32.39 | 123.35 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 5 (cont) Motor activity - group mean values (number of beam breaks) - week 13 horizontal

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | Mean | 637.9 | 296.6 | 136.4 | 51.1 | 9.7 | 12.9 | 15.0 | 5.9 | 12.8 | 8.7 | 11.5 | 68.3 |
| | SD | 122.05 | 129.89 | 106.45 | 37.59 | 9.93 | 16.26 | 27.55 | 6.05 | 15.79 | 6.13 | 10.30 | 149.79 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2F | Mean | 719.3 | 326.5 | 229.5 | 102.1 | 47.0 | 46.9 | 33.3 | 18.2 | 41.2 | 41.6 | 50.1 | 41.5 |
| | SD | 127.62 | 116.52 | 124.79 | 116.23 | 72.17 | 119.66 | 95.90 | 23.36 | 104.78 | 70.30 | 93.77 | 51.20 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3F | Mean | 673.7 | 317.2 | 173.2 | 78.6 | 34.6 | 71.0 | 56.0 | 77.6 | 42.2 | 76.2 | 60.3 | 29.2 |
| | SD | 107.89 | 135.60 | 139.18 | 119.11 | 48.08 | 118.49 | 84.26 | 99.66 | 58.52 | 117.54 | 102.10 | 77.66 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4F | Mean | 598.3 | 258.6 | 123.9 | 46.7 | 35.3 | 20.3 | 23.6 | 39.3 | 26.5 | 19.2 | 8.8 | 22.0 |
| | SD | 114.96 | 102.26 | 116.08 | 41.82 | 43.24 | 21.33 | 25.56 | 81.73 | 27.38 | 18.98 | 9.94 | 28.71 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 5 (cont) Motor activity - group mean values (number of beam breaks) - week 13 vertical

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | Mean | 30.4 | 16.4 | 7.6 | 0.6 | 0.6 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | SD | 7.75 | 10.60 | 6.65 | 0.97 | 1.90 | 0.00 | 0.63 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2M | Mean | 28.6 | 10.1 | 2.5 | 0.9 | 1.6 | 0.0 | 0.5 | 0.2 | 0.0 | 0.0 | 0.4 | 1.6 |
| | SD | 12.85 | 6.15 | 3.47 | 2.51 | 2.84 | 0.00 | 1.27 | 0.63 | 0.00 | 0.00 | 1.26 | 3.50 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3M | Mean | 31.7 | 20.2 | 4.1 | 3.5 | 0.2 | 0.0 | 0.4 | 0.0 | 0.0 | 0.6 | 0.4 | 0.0 |
| | SD | 7.63 | 10.65 | 3.18 | 7.98 | 0.63 | 0.00 | 1.26 | 0.00 | 0.00 | 1.90 | 0.84 | 0.00 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | 26.6 | 11.0 | 4.0 | 1.6 | 0.2 | 0.0 | 0.0 | 0.5 | 1.3 | 0.0 | 0.0 | 1.9 |
| | SD | 9.83 | 5.89 | 5.87 | 4.06 | 0.63 | 0.00 | 0.00 | 1.58 | 3.20 | 0.00 | 0.00 | 3.75 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 5 (cont) Motor activity - group mean values (number of beam breaks) - week 13 vertical

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | Mean | 27.7 | 7.5 | 3.7 | 0.5 | 0.0 | 0.1 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 1.8 |
| | SD | 6.38 | 4.30 | 5.36 | 0.97 | 0.00 | 0.32 | 0.63 | 0.00 | 0.00 | 0.00 | 0.00 | 4.73 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2F | Mean | 33.4 | 9.4 | 8.4 | 2.8 | 0.8 | 1.0 | 1.1 | 0.1 | 0.8 | 0.5 | 0.2 | 0.7 |
| | SD | 7.55 | 6.88 | 6.54 | 5.53 | 2.53 | 3.16 | 3.48 | 0.32 | 2.53 | 1.58 | 0.63 | 1.34 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3F | Mean | 33.3 | 13.6 | 6.4 | 2.6 | 0.3 | 2.8 | 1.3 | 3.5 | 0.5 | 4.3 | 2.7 | 2.1 |
| | SD | 10.08 | 10.31 | 7.79 | 5.64 | 0.67 | 6.20 | 2.54 | 6.38 | 1.08 | 8.82 | 5.93 | 6.64 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4F | Mean | 28.1 | 8.3 | 5.9 | 0.6 | 0.4 | 0.2 | 0.6 | 0.8 | 0.1 | 0.0 | 0.0 | 0.5 |
| | SD | 6.30 | 8.12 | 10.64 | 1.90 | 1.26 | 0.63 | 1.58 | 2.53 | 0.32 | 0.00 | 0.00 | 1.08 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 6 Functional observational battery - summary of assessments - pretest

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Group 1 | Group 2 | Group 3 | Group 4 | Group 1 | Group 2 | Group 3 | Group 4 |
| **Body Temperature (ºC)** | Mean | 38.5 | 38.3 | 38.1* | 37.8** | 38.4 | 37.9** | 37.8** | 37.8** |
| | S.D. | 0.3 | 0.4 | 0.2 | 0.5 | 0.2 | 0.2 | 0.4 | 0.4 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Forelimb Grip Strength (g)** | Mean | 399.4 | 460.1 | 447.9 | 437.3 | 452.3 | 406.4 | 461.0 | 429.5 |
| | S.D. | 63.5 | 97.9 | 78.3 | 83.3 | 65.9 | 94.5 | 88.3 | 77.3 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Hindlimb Grip Strength (g)** | Mean | 260.2 | 257.2 | 267.9 | 250.3 | 263.1 | 283.7 | 267.0 | 253.4 |
| | S.D. | 85.4 | 84.2 | 84.2 | 53.4 | 50.6 | 67.0 | 56.7 | 55.7 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Landing Foot Splay (cm)** | Mean | 3.7 | 4.3 | 3.8 | 4.1 | 4.0 | 4.1 | 4.2 | 3.5 |
| | S.D. | 0.7 | 0.9 | 0.9 | 1.0 | 0.7 | 0.9 | 0.7 | 0.7 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 6 (cont) Functional observational battery - summary of assessments - pretest

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | Number of Animals Examined: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Home Cage Evaluations** | | | | | | | | | |
| Posture | Sitting or Standing Normally | 10 | 9 | 7 | 8 | 9 | 4 | 4 | 7 |
| | Rearing; Standing on Hindlimbs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Asleep; May Be Lying on Side or Curled Up | 0 | 1 | 3 | 2 | 1 | 6 | 6 | 3 |
| | Lying on Side; Limbs in the Air | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flattened; Limbs May Be Spread | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Crouched; Sitting Hunched, Head Hung Down | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Palpebral Closure | Eyelids Open | 10 | 9 | 7 | 8 | 9 | 4 | 4 | 7 |
| | Eyelids Slightly Drooping | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Eyelids Half Closed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Eyelids Completely Closed | 0 | 1 | 3 | 2 | 1 | 6 | 6 | 3 |
| Vocalizations | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Motor Movements | No Abnormal Movements | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Tremors | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Fasciculations | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Convulsions | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Stereotypy | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 6 (cont) Functional observational battery - summary of assessments - pretest

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | Number of Animals Examined: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Handling Evaluations** | | | | | | | | | |
| Ease of Removal | Very Easy | 7 | 7 | 4 | 9 | 6 | 9 | 7 | 10 |
| | Easy | 3 | 3 | 6 | 1 | 4 | 1 | 3 | 0 |
| | Slightly Difficult | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Freezes or Flinches | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Moderately Difficult | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Very Difficult | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ease of Handling | Low | 10 | 8 | 9 | 9 | 8 | 9 | 9 | 10 |
| | Moderately Low | 0 | 2 | 1 | 1 | 2 | 1 | 1 | 0 |
| | Moderately High | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | High | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chromodacryorrhea | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lacrimation | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Extreme | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Salivation | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Slight | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Extreme | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 6 (cont) Functional observational battery - summary of assessments - pretest

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | | Number of Animals Examined: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Handling Evaluations (cont)** | | | | | | | | | | |
| Coat | Normal | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Slightly Soiled | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Moderately Soiled | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Extremely Soiled | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Open Field Evaluations** | | | | | | | | | | |
| Gait and Posture | Normal | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | **Ataxia** | | | | | | | | | |
| | | Slight | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Hindlimbs Splayed or Drag** | | | | | | | | | |
| | | Slight | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Forelimbs Splayed or Drag** | | | | | | | | | |
| | | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Walks on Tiptoes** | | | | | | | | | |
| | | Slight | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Hunched Posture** | | | | | | | | | |
| | | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Body Drags or is Flattened** | | | | | | | | | |
| | | Slight | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 6 (cont) Functional observational battery - summary of assessments - pretest

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | Number of Animals Examined: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Open Field Evaluations (cont)** | | | | | | | | | |
| Locomotion | No Impairment | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Slightly Impaired | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Moderately Impaired | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Severely Impaired | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Arousal | Very Low, Stupor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Moderately Low, Slight Stupor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Slightly Low, Sluggish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Alert | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | High, Slight Excitement | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Very High, Hyper Alert | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Piloerection | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exophthalmia | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Urine | Number of Pools | 10 | 5 | 8 | 0 | 5 | 3 | 1 | 5 |
| | Polyuria | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Feces | Number of Boluses | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| | Unformed Stool | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 6 (cont) Functional observational battery - summary of assessments - pretest

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | Number of Animals Examined: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Motor Movements** | | | | | | | | | |
| Fasciculations | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tremors | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Convulsions | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Reflex Assessments** | | | | | | | | | |
| Visual Approach | No Reaction | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Slowly Approaches, Sniffs and/or Turns Away | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Freezes or Pulls Away Slightly | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Jumps or Turns Abruptly to Avoid | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Attacks and/or Bites | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Audition | No Reaction | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Slight Reaction, Some Evidence That Noise was Heard | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flinches or Flicks Ears | 10 | 10 | 9 | 10 | 10 | 10 | 10 | 10 |
| | Exaggerated; Jumps, Flips, Bites | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

TABLE 6 (cont) Functional observational battery - summary of assessments - pretest

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | Number of Animals Examined: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Reflex Assessments (cont)** | | | | | | | | | |
| Pinna | Ear Flattens Against Head or Animal Shakes Head | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | No Response | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Proprioception | Returns Leg to Original Position | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Returns Leg Only Partially to Original Position | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | No Response, Allows Leg to Remain in Pulled Back Position | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pain | No Reaction | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Turns or Walks Forward, or Vocalizes with Little or No Movement | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Flinches; Muscle Contractions Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Exaggerated Reaction; Jumps, Attacks, Bites | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pupil Response | Pupil Constricts | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | No Constriction | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Miosis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Mydriasis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Air Righting Reflex | Normal: Lands on All Four Feet | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Slightly Uncoordinated | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Lands on Side | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Lands on Back | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 6 (cont) Functional observational battery - summary of assessments - week 4

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Group 1 | Group 2 | Group 3 | Group 4 | Group 1 | Group 2 | Group 3 | Group 4 |
| **Body Temperature (ºC)** | Mean | 38.1 | 38.1 | 37.8 | 38.2 | 38.6 | 38.5 | 38.9 | 38.7 |
| | S.D. | 0.5 | 0.7 | 0.4 | 0.5 | 0.6 | 0.7 | 0.4 | 0.2 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Forelimb Grip Strength (g)** | Mean | 1081.2 | 1100.8 | 1081.9 | 1125.1 | 1014.5 | 1012.0 | 1033.3 | 961.2 |
| | S.D. | 195.0 | 170.0 | 155.3 | 68.8 | 80.1 | 70.2 | 167.7 | 56.5 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Hindlimb Grip Strength (g)** | Mean | 729.0 | 697.9 | 654.9 | 663.7 | 609.9 | 583.9 | 565.6 | 569.3 |
| | S.D. | 113.6 | 60.3 | 85.7 | 94.6 | 98.2 | 116.5 | 129.7 | 106.5 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Landing Foot Splay (cm)** | Mean | 4.9 | 5.8 | 5.2 | 5.7 | 4.9 | 5.3 | 5.3 | 4.8 |
| | S.D. | 1.0 | 1.6 | 0.8 | 1.0 | 0.7 | 1.6 | 1.3 | 0.8 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 6 (cont) Functional observational battery - summary of assessments - week 4

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | Number of Animals Examined: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Home Cage Evaluations** | | | | | | | | | |
| Posture | Sitting or Standing Normally | 6 | 6 | 7 | 7 | 9 | 9 | 10 | 9 |
| | Rearing; Standing on Hindlimbs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Asleep; May Be Lying on Side or Curled Up | 4 | 4 | 3 | 3 | 1 | 1 | 0 | 1 |
| | Lying on Side; Limbs in the Air | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flattened; Limbs May Be Spread | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Crouched; Sitting Hunched, Head Hung Down | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Palpebral Closure | Eyelids Open | 5 | 6 | 7 | 7 | 9 | 9 | 10 | 9 |
| | Eyelids Slightly Drooping | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Eyelids Half Closed | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Eyelids Completely Closed | 4 | 4 | 3 | 3 | 1 | 1 | 0 | 1 |
| Vocalizations | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Motor Movements | No Abnormal Movements | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Tremors | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Fasciculations | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Convulsions | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Stereotypy | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 6 (cont) Functional observational battery - summary of assessments - week 4

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | Number of Animals Examined: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Handling Evaluations** | | | | | | | | | |
| Ease of Removal | Very Easy | 10 | 10 | 10 | 10 | 10 | 10 | 8 | 9 |
| | Easy | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 |
| | Slightly Difficult | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Freezes or Flinches | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Moderately Difficult | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Very Difficult | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ease of Handling | Low | 10 | 10 | 10 | 10 | 10 | 9 | 10 | 10 |
| | Moderately Low | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| | Moderately High | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | High | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chromodacryorrhea | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lacrimation | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Extreme | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Salivation | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Slight | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Extreme | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 6 (cont) Functional observational battery - summary of assessments - week 4

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | | Number of Animals Examined: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Handling Evaluations (cont)** | | | | | | | | | | |
| Coat | Normal | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Slightly Soiled | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Moderately Soiled | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Extremely Soiled | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Open Field Evaluations** | | | | | | | | | | |
| Gait and Posture | Normal | | 10 | 9 | 10 | 10 | 10 | 10 | 10 | 10 |
| | **Ataxia** | | | | | | | | | |
| | | Slight | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Hindlimbs Splayed or Drag** | | | | | | | | | |
| | | Slight | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Forelimbs Splayed or Drag** | | | | | | | | | |
| | | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Walks on Tiptoes** | | | | | | | | | |
| | | Slight | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Hunched Posture** | | | | | | | | | |
| | | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Body Drags or is Flattened** | | | | | | | | | |
| | | Slight | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 6 (cont) Functional observational battery - summary of assessments - week 4

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | Number of Animals Examined: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Open Field Evaluations (cont)** | | | | | | | | | |
| Locomotion | No Impairment | 9 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Slightly Impaired | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Moderately Impaired | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Severely Impaired | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Arousal | Very Low, Stupor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Moderately Low, Slight Stupor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Slightly Low, Sluggish | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| | Alert | 7 | 9 | 9 | 10 | 10 | 10 | 10 | 10 |
| | High, Slight Excitement | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Very High, Hyper Alert | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Piloerection | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exophthalmia | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Urine | Number of Pools | 15 | 11 | 24 | 15 | 0 | 1 | 1 | 0 |
| | Polyuria | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Feces | Number of Boluses | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Unformed Stool | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 6 (cont) Functional observational battery - summary of assessments - week 4

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | Number of Animals Examined: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Motor Movements** | | | | | | | | | |
| Fasciculations | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tremors | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Convulsions | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Reflex Assessments** | | | | | | | | | |
| Visual Approach | No Reaction | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Slowly Approaches, Sniffs and/or Turns Away | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 |
| | Freezes or Pulls Away Slightly | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | Jumps or Turns Abruptly to Avoid | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Attacks and/or Bites | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Audition | No Reaction | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Slight Reaction, Some Evidence That Noise was Heard | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flinches or Flicks Ears | 10 | 9 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Exaggerated; Jumps, Flips, Bites | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 6 (cont) Functional observational battery - summary of assessments - week 4

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | Number of Animals Examined: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Reflex Assessments (cont)** | | | | | | | | | |
| Pinna | Ear Flattens Against Head or Animal Shakes Head | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | No Response | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Proprioception | Returns Leg to Original Position | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Returns Leg Only Partially to Original Position | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | No Response, Allows Leg to Remain in Pulled Back Position | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pain | No Reaction | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Turns or Walks Forward, or Vocalizes with Little or No Movement | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Flinches; Muscle Contractions Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Exaggerated Reaction; Jumps, Attacks, Bites | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pupil Response | Pupil Constricts | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | No Constriction | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Miosis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Mydriasis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Air Righting Reflex | Normal: Lands on All Four Feet | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Slightly Uncoordinated | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Lands on Side | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Lands on Back | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 6 (cont) Functional observational battery - summary of assessments - week 8

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Group 1 | Group 2 | Group 3 | Group 4 | Group 1 | Group 2 | Group 3 | Group 4 |
| **Body Temperature (ºC)** | Mean | 37.9 | 37.9 | 37.9 | 38.0* | 38.4 | 38.3 | 38.4 | 38.4 |
| | S.D. | 0.7 | 0.6 | 0.6 | 0.8 | 0.6 | 0.8 | 0.5 | 0.6 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Forelimb Grip Strength (g)** | Mean | 1106.2 | 1122.0 | 1055.2 | 1120.0 | 985.4 | 964.4 | 1009.3 | 996.1 |
| | S.D. | 172.8 | 136.0 | 203.0 | 148.2 | 86.1 | 189.4 | 223.2 | 202.0 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Hindlimb Grip Strength (g)** | Mean | 712.1 | 674.3 | 648.7 | 704.8 | 622.9 | 576.3 | 566.5 | 532.6 |
| | S.D. | 144.7 | 75.5 | 152.5 | 107.1 | 142.9 | 49.7 | 170.3 | 92.0 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Landing Foot Splay (cm)** | Mean | 5.1 | 6.1 | 5.1 | 5.7 | 4.3 | 5.1 | 4.7 | 4.9 |
| | S.D. | 0.9 | 1.6 | 1.2 | 0.8 | 0.8 | 1.4 | 0.9 | 1.0 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 6 (cont) Functional observational battery - summary of assessments - week 8

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | Number of Animals Examined: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Home Cage Evaluations** | | | | | | | | | |
| Posture | Sitting or Standing Normally | 3 | 4 | 8 | 6 | 7 | 7 | 8 | 8 |
| | Rearing; Standing on Hindlimbs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Asleep; May Be Lying on Side or Curled Up | 7 | 6 | 2 | 4 | 3 | 3 | 2 | 2 |
| | Lying on Side; Limbs in the Air | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flattened; Limbs May Be Spread | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Crouched; Sitting Hunched, Head Hung Down | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Palpebral Closure | Eyelids Open | 3 | 4 | 6 | 6 | 7 | 7 | 8 | 8 |
| | Eyelids Slightly Drooping | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Eyelids Half Closed | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| | Eyelids Completely Closed | 7 | 6 | 3 | 4 | 3 | 3 | 2 | 2 |
| Vocalizations | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Motor Movements | No Abnormal Movements | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Tremors | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Fasciculations | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Convulsions | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Stereotypy | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 6 (cont) Functional observational battery - summary of assessments - week 8

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | Number of Animals Examined: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Handling Evaluations** | | | | | | | | | |
| Ease of Removal | Very Easy | 10 | 10 | 10 | 9 | 9 | 10 | 9 | 10 |
| | Easy | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 |
| | Slightly Difficult | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Freezes or Flinches | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Moderately Difficult | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Very Difficult | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ease of Handling | Low | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Moderately Low | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Moderately High | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | High | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chromodacryorrhea | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lacrimation | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Extreme | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Salivation | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Slight | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Extreme | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 6 (cont) Functional observational battery - summary of assessments - week 8

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | | Number of Animals Examined: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Handling Evaluations (cont)** | | | | | | | | | | |
| Coat | Normal | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Slightly Soiled | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Moderately Soiled | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Extremely Soiled | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Open Field Evaluations** | | | | | | | | | | |
| Gait and Posture | Normal | | 10 | 10 | 10 | 10 | 9 | 10 | 10 | 10 |
| | **Ataxia** | | | | | | | | | |
| | | Slight | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Hindlimbs Splayed or Drag** | | | | | | | | | |
| | | Slight | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Forelimbs Splayed or Drag** | | | | | | | | | |
| | | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Walks on Tiptoes** | | | | | | | | | |
| | | Slight | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Hunched Posture** | | | | | | | | | |
| | | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Body Drags or is Flattened** | | | | | | | | | |
| | | Slight | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 6 (cont) Functional observational battery - summary of assessments - week 8

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | Number of Animals Examined: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Open Field Evaluations (cont)** | | | | | | | | | |
| Locomotion | No Impairment | 9 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Slightly Impaired | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Moderately Impaired | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Severely Impaired | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Arousal | Very Low, Stupor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Moderately Low, Slight Stupor | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Slightly Low, Sluggish | 2 | 4 | 0 | 1 | 1 | 1 | 0 | 1 |
| | Alert | 7 | 6 | 10 | 9 | 9 | 9 | 10 | 9 |
| | High, Slight Excitement | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Very High, Hyper Alert | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Piloerection | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exophthalmia | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Urine | Number of Pools | 26 | 11 | 40 | 15 | 0 | 0 | 0 | 0 |
| | Polyuria | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Feces | Number of Boluses | 2 | 5 | 7 | 0 | 0 | 0 | 0 | 0 |
| | Unformed Stool | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 6 (cont) Functional observational battery - summary of assessments - week 8

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | Number of Animals Examined: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Motor Movements** | | | | | | | | | |
| Fasciculations | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tremors | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Convulsions | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Reflex Assessments** | | | | | | | | | |
| Visual Approach | No Reaction | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Slowly Approaches, Sniffs and/or Turns Away | 5 | 9 | 9 | 10 | 10 | 10 | 10 | 10 |
| | Freezes or Pulls Away Slightly | 5 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| | Jumps or Turns Abruptly to Avoid | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Attacks and/or Bites | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Audition | No Reaction | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Slight Reaction, Some Evidence That Noise was Heard | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flinches or Flicks Ears | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Exaggerated; Jumps, Flips, Bites | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 6 (cont) Functional observational battery - summary of assessments - week 8

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | Number of Animals Examined: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Reflex Assessments (cont)** | | | | | | | | | |
| Pinna | Ear Flattens Against Head or Animal Shakes Head | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | No Response | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Proprioception | Returns Leg to Original Position | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Returns Leg Only Partially to Original Position | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | No Response, Allows Leg to Remain in Pulled Back Position | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pain | No Reaction | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Turns or Walks Forward, or Vocalizes with Little or No Movement | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Flinches; Muscle Contractions Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Exaggerated Reaction; Jumps, Attacks, Bites | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pupil Response | Pupil Constricts | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | No Constriction | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Miosis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Mydriasis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Air Righting Reflex | Normal: Lands on All Four Feet | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Slightly Uncoordinated | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Lands on Side | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Lands on Back | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 6 (cont) Functional observational battery - summary of assessments - week 13

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Group 1 | Group 2 | Group 3 | Group 4 | Group 1 | Group 2 | Group 3 | Group 4 |
| **Body Temperature (ºC)** | Mean | 37.3 | 37.8 | 37.6 | 37.8* | 37.7 | 37.8 | 38.2 | 38.1 |
| | S.D. | 0.5 | 0.6 | 0.4 | 0.5 | 0.5 | 0.6 | 0.6 | 0.5 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Forelimb Grip Strength (g)** | Mean | 1140.1 | 1298.2 | 1178.5 | 1261.9 | 1056.3 | 958.1 | 1130.0 | 1005.8 |
| | S.D. | 224.9 | 127.4 | 193.1 | 151.8 | 124.8 | 244.6 | 206.1 | 167.8 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Hindlimb Grip Strength (g)** | Mean | 777.1 | 826.4 | 751.5 | 850.2 | 670.3 | 626.8 | 614.2 | 635.5 |
| | S.D. | 102.3 | 159.2 | 143.8 | 210.5 | 115.8 | 112.9 | 123.6 | 95.3 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Landing Foot Splay (cm)** | Mean | 4.6 | 5.5 | 5.2 | 5.3 | 4.5 | 5.2 | 5.1 | 5.1 |
| | S.D. | 0.7 | 1.5 | 1.3 | 1.1 | 0.6 | 1.5 | 0.8 | 0.7 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 6 (cont) Functional observational battery - summary of assessments - week 13

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | Number of Animals Examined: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Home Cage Evaluations** | | | | | | | | | |
| Posture | Sitting or Standing Normally | 5 | 5 | 4 | 8 | 5 | 3 | 7 | 7 |
| | Rearing; Standing on Hindlimbs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Asleep; May Be Lying on Side or Curled Up | 5 | 5 | 6 | 2 | 5 | 7 | 3 | 3 |
| | Lying on Side; Limbs in the Air | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flattened; Limbs May Be Spread | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Crouched; Sitting Hunched, Head Hung Down | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Palpebral Closure | Eyelids Open | 5 | 5 | 4 | 8 | 5 | 3 | 7 | 7 |
| | Eyelids Slightly Drooping | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Eyelids Half Closed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Eyelids Completely Closed | 5 | 5 | 6 | 2 | 5 | 7 | 3 | 3 |
| Vocalizations | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Motor Movements | No Abnormal Movements | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Tremors | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Fasciculations | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Convulsions | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Stereotypy | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 6 (cont) Functional observational battery - summary of assessments - week 13

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | Number of Animals Examined: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Handling Evaluations** | | | | | | | | | |
| Ease of Removal | Very Easy | 10 | 10 | 9 | 10 | 10 | 10 | 10 | 10 |
| | Easy | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| | Slightly Difficult | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Freezes or Flinches | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Moderately Difficult | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Very Difficult | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ease of Handling | Low | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Moderately Low | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Moderately High | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | High | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chromodacryorrhea | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lacrimation | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Extreme | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Salivation | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Slight | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Extreme | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 6 (cont) Functional observational battery - summary of assessments - week 13

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | | Number of Animals Examined: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Handling Evaluations (cont)** | | | | | | | | | | |
| Coat | Normal | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Slightly Soiled | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Moderately Soiled | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Extremely Soiled | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Open Field Evaluations** | | | | | | | | | | |
| Gait and Posture | Normal | | 10 | 10 | 10 | 10 | 9 | 10 | 10 | 10 |
| | **Ataxia** | | | | | | | | | |
| | | Slight | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Hindlimbs Splayed or Drag** | | | | | | | | | |
| | | Slight | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Forelimbs Splayed or Drag** | | | | | | | | | |
| | | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Walks on Tiptoes** | | | | | | | | | |
| | | Slight | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Hunched Posture** | | | | | | | | | |
| | | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Body Drags or is Flattened** | | | | | | | | | |
| | | Slight | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Moderate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 6 (cont) Functional observational battery - summary of assessments - week 13

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | Number of Animals Examined: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Open Field Evaluations (cont)** | | | | | | | | | |
| Locomotion | No Impairment | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Slightly Impaired | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Moderately Impaired | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Severely Impaired | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Arousal | Very Low, Stupor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Moderately Low, Slight Stupor | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Slightly Low, Sluggish | 0 | 4 | 2 | 2 | 1 | 2 | 0 | 1 |
| | Alert | 9 | 6 | 8 | 8 | 9 | 8 | 10 | 9 |
| | High, Slight Excitement | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Very High, Hyper Alert | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Piloerection | Not Present | 10 | 10 | 10 | 10 | 8 | 9 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 |
| Exophthalmia | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Urine | Number of Pools | 21 | 19 | 21 | 22 | 0 | 1 | 13 | 5 |
| | Polyuria | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Feces | Number of Boluses | 2 | 13 | 4 | 0 | 0 | 0 | 4 | 0 |
| | Unformed Stool | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 6 (cont) Functional observational battery - summary of assessments - week 13

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | Number of Animals Examined: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Motor Movements** | | | | | | | | | |
| Fasciculations | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tremors | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Convulsions | Not Present | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Reflex Assessments** | | | | | | | | | |
| Visual Approach | No Reaction | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Slowly Approaches, Sniffs and/or Turns Away | 9 | 8 | 10 | 9 | 10 | 10 | 10 | 10 |
| | Freezes or Pulls Away Slightly | 1 | 2 | 0 | 1 | 0 | 0 | 0 | 0 |
| | Jumps or Turns Abruptly to Avoid | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Attacks and/or Bites | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Audition | No Reaction | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Slight Reaction, Some Evidence That Noise was Heard | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Flinches or Flicks Ears | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Exaggerated; Jumps, Flips, Bites | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 6 (cont) Functional observational battery - summary of assessments - week 13

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | Number of Animals Examined: | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| **Reflex Assessments (cont)** | | | | | | | | | |
| Pinna | Ear Flattens Against Head or Animal Shakes Head | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | No Response | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Proprioception | Returns Leg to Original Position | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Returns Leg Only Partially to Original Position | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | No Response, Allows Leg to Remain in Pulled Back Position | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pain | No Reaction | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Turns or Walks Forward, or Vocalizes with Little or No Movement | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Flinches; Muscle Contractions Present | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Exaggerated Reaction; Jumps, Attacks, Bites | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pupil Response | Pupil Constricts | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | No Constriction | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Miosis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Mydriasis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Air Righting Reflex | Normal: Lands on All Four Feet | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Slightly Uncoordinated | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Lands on Side | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Lands on Back | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 7 Hematology - group mean values

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Occasion Week 5 | HGB g/dL | HCT % | RBC x10^6/uL | RETIC x10^9/L | PLT x10^3/uL | MCV fL | MCH pg | MCHC g/dL | RDW % | WBC x10^3/uL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | Mean | | 16.4 | 50.5 | 8.31 | 244.2 | 946 | 60.9 | 19.8 | 32.5 | 11.8 | 11.31 |
| | SD | | 0.51 | 1.39 | 0.268 | 34.50 | 160.9 | 1.13 | 0.47 | 0.28 | 0.60 | 1.944 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2M | Mean | | 16.7 | 51.4 | 8.51 | 209.1 | 897 | 60.4 | 19.7 | 32.5 | 11.5 | 10.80 |
| | SD | | 0.55 | 2.17 | 0.435 | 37.92 | 177.1 | 1.73 | 0.68 | 0.44 | 0.29 | 1.398 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3M | Mean | | 16.4 | 50.4 | 8.29 | 252.9 | 922 | 60.8 | 19.8 | 32.6 | 11.6 | 10.80 |
| | SD | | 0.72 | 1.79 | 0.382 | 43.35 | 130.7 | 1.76 | 0.70 | 0.43 | 0.31 | 1.291 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | | 16.4 | 51.3 | 8.38 | 250.5 | 910 | 61.2 | 19.6 | 32.0 | 11.4* | 9.86 |
| | SD | | 0.80 | 1.93 | 0.386 | 49.54 | 193.7 | 0.98 | 1.18 | 1.59 | 0.35 | 1.834 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 7 (cont) Hematology - group mean values

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Occasion Week 5 | ANEU x10^3/uL | ALYM x10^3/uL | AMONO x10^3/uL | AEOS x10^3/uL | ABASO x10^3/uL | ALUC x10^3/uL |
|---|---|---|---|---|---|---|---|---|
| 1M | Mean | | 1.25 | 9.58 | 0.21 | 0.12 | 0.04 | 0.13 |
| | SD | | 0.291 | 1.899 | 0.046 | 0.056 | 0.010 | 0.038 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 |
| 2M | Mean | | 1.22 | 9.11 | 0.21 | 0.11 | 0.03 | 0.11 |
| | SD | | 0.456 | 1.308 | 0.036 | 0.145 | 0.011 | 0.030 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 |
| 3M | Mean | | 1.44 | 8.88 | 0.24 | 0.11 | 0.03 | 0.11 |
| | SD | | 0.364 | 1.355 | 0.075 | 0.031 | 0.010 | 0.021 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | | 1.10 | 8.32 | 0.19 | 0.12 | 0.03 | 0.11 |
| | SD | | 0.361 | 1.869 | 0.057 | 0.095 | 0.007 | 0.040 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 7 (cont) Hematology - group mean values

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Occasion Termination | HGB g/dL | HCT % | RBC x10^6/uL | RETIC x10^9/L | PLT x10^3/uL | MCV fL | MCH pg | MCHC g/dL | RDW % | WBC x10^3/uL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | Mean | | 15.0 | 46.1 | 8.26 | 221.8 | 958 | 55.8 | 18.2 | 32.6 | 13.8 | 11.27 |
| | SD | | 0.58 | 2.07 | 0.419 | 48.31 | 142.0 | 1.18 | 0.51 | 0.73 | 1.17 | 3.225 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2M | Mean | | 15.1 | 46.2 | 8.46 | 198.5 | 981 | 54.6 | 17.8 | 32.6 | 13.6 | 10.77 |
| | SD | | 0.66 | 2.18 | 0.531 | 30.63 | 93.1 | 1.28 | 0.62 | 0.67 | 0.58 | 1.972 |
| | N | | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| 3M | Mean | | 14.9 | 45.7 | 8.26 | 242.8 | 954 | 55.3 | 18.0 | 32.6 | 14.0 | 13.31 |
| | SD | | 0.49 | 1.35 | 0.239 | 55.40 | 74.5 | 1.18 | 0.54 | 0.53 | 0.82 | 2.902 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | | 14.9 | 45.5 | 8.31 | 203.1 | 951 | 54.8 | 18.0 | 32.8 | 13.0 | 10.70 |
| | SD | | 0.71 | 2.22 | 0.389 | 47.03 | 151.2 | 1.08 | 0.38 | 0.27 | 0.77 | 1.780 |
| | N | | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |

TABLE 7 (cont) Hematology - group mean values

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Occasion Termination | ANEU x10^3/uL | ALYM x10^3/uL | AMONO x10^3/uL | AEOS x10^3/uL | ABASO x10^3/uL | ALUC x10^3/uL |
|---|---|---|---|---|---|---|---|---|
| 1M | Mean | | 1.30 | 9.44 | 0.26 | 0.16 | 0.02 | 0.08 |
| | SD | | 0.365 | 3.132 | 0.091 | 0.044 | 0.015 | 0.047 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 |
| 2M | Mean | | 1.26 | 8.85 | 0.37 | 0.12 | 0.02 | 0.16* |
| | SD | | 0.306 | 1.679 | 0.110 | 0.047 | 0.008 | 0.062 |
| | N | | 9 | 9 | 9 | 9 | 9 | 9 |
| 3M | Mean | | 1.60 | 10.90 | 0.43** | 0.21 | 0.03 | 0.14* |
| | SD | | 0.482 | 2.876 | 0.111 | 0.045 | 0.013 | 0.060 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | | 1.12 | 9.01 | 0.29 | 0.13 | 0.02 | 0.13* |
| | SD | | 0.566 | 1.819 | 0.089 | 0.034 | 0.015 | 0.042 |
| | N | | 8 | 8 | 8 | 8 | 8 | 8 |

TABLE 7 (cont) Hematology - group mean values

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Occasion Week 5 | HGB g/dL | HCT % | RBC x10^6/uL | RETIC x10^9/L | PLT x10^3/uL | MCV fL | MCH pg | MCHC g/dL | RDW % | WBC x10^3/uL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | Mean | | 16.2 | 47.3 | 8.21 | 206.0 | 1023 | 57.7 | 19.7 | 34.2 | 10.9 | 9.94 |
| | SD | | 0.74 | 2.36 | 0.312 | 33.77 | 198.4 | 1.47 | 0.57 | 0.58 | 0.28 | 2.392 |
| | N | | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| 2F | Mean | | 16.0 | 46.4 | 7.86* | 191.6 | 1134 | 59.1 | 20.3 | 34.4 | 10.9 | 11.86 |
| | SD | | 0.49 | 1.65 | 0.283 | 42.49 | 102.1 | 1.15 | 0.52 | 0.44 | 0.36 | 2.563 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3F | Mean | | 16.2 | 47.1 | 8.07 | 180.9 | 1079 | 58.4 | 20.1 | 34.5 | 11.0 | 9.06 |
| | SD | | 0.41 | 1.39 | 0.287 | 54.41 | 97.0 | 1.50 | 0.61 | 0.33 | 0.32 | 1.210 |
| | N | | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| 4F | Mean | | 16.3 | 47.7 | 8.22 | 216.9 | 1048 | 58.0 | 19.8 | 34.1 | 11.0 | 10.46 |
| | SD | | 0.72 | 2.01 | 0.284 | 46.03 | 98.7 | 1.94 | 0.67 | 0.31 | 0.39 | 2.208 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 7 (cont) Hematology - group mean values

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Occasion Week 5 | ANEU x10^3/uL | ALYM x10^3/uL | AMONO x10^3/uL | AEOS x10^3/uL | ABASO x10^3/uL | ALUC x10^3/uL |
|---|---|---|---|---|---|---|---|---|
| 1F | Mean | | 0.82 | 8.72 | 0.14 | 0.12 | 0.02 | 0.12 |
| | SD | | 0.391 | 1.929 | 0.069 | 0.083 | 0.013 | 0.059 |
| | N | | 9 | 9 | 9 | 9 | 9 | 9 |
| 2F | Mean | | 0.85 | 10.49 | 0.18 | 0.17 | 0.04 | 0.13 |
| | SD | | 0.253 | 2.414 | 0.053 | 0.127 | 0.017 | 0.053 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 |
| 3F | Mean | | 0.64 | 8.04 | 0.15 | 0.11 | 0.03 | 0.10 |
| | SD | | 0.074 | 1.124 | 0.060 | 0.044 | 0.009 | 0.031 |
| | N | | 9 | 9 | 9 | 9 | 9 | 9 |
| 4F | Mean | | 0.95 | 9.17 | 0.13 | 0.09 | 0.03 | 0.10 |
| | SD | | 0.282 | 2.155 | 0.041 | 0.031 | 0.012 | 0.037 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 7 (cont) Hematology - group mean values

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Occasion Termination | HGB g/dL | HCT % | RBC x10^6/uL | RETIC x10^9/L | PLT x10^3/uL | MCV fL | MCH pg | MCHC g/dL | RDW % | WBC x10^3/uL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | Mean | | 14.4 | 43.7 | 7.81 | 182.1 | 920 | 56.0 | 18.4 | 32.9 | 11.6 | 7.73 |
| | SD | | 0.57 | 2.00 | 0.299 | 33.06 | 71.2 | 1.25 | 0.55 | 0.61 | 0.48 | 3.317 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2F | Mean | | 14.7 | 44.4 | 7.81 | 171.1 | 1015 | 56.8 | 18.9 | 33.2 | 11.6 | 9.20 |
| | SD | | 0.42 | 1.74 | 0.232 | 47.31 | 81.0 | 1.25 | 0.60 | 0.86 | 0.36 | 2.070 |
| | N | | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| 3F | Mean | | 14.7 | 43.8 | 7.85 | 170.7 | 937 | 55.8 | 18.7 | 33.5 | 11.7 | 8.06 |
| | SD | | 0.27 | 1.30 | 0.264 | 31.12 | 104.6 | 1.80 | 0.57 | 0.76 | 0.41 | 2.376 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4F | Mean | | 14.6 | 43.0 | 7.70 | 190.1 | 888 | 55.8 | 19.1 | 34.1* | 11.7 | 8.20 |
| | SD | | 0.45 | 2.84 | 0.453 | 26.05 | 56.0 | 1.92 | 1.11 | 1.98 | 0.59 | 2.014 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 7 (cont) Hematology - group mean values

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Occasion Termination | ANEU x10^3/uL | ALYM x10^3/uL | AMONO x10^3/uL | AEOS x10^3/uL | ABASO x10^3/uL | ALUC x10^3/uL |
|---|---|---|---|---|---|---|---|---|
| 1F | Mean | | 0.92 | 6.43 | 0.19 | 0.11 | 0.02 | 0.06 |
| | SD | | 0.441 | 2.836 | 0.084 | 0.048 | 0.018 | 0.029 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 |
| 2F | Mean | | 0.62 | 8.12 | 0.18 | 0.14 | 0.03 | 0.10 |
| | SD | | 0.110 | 2.004 | 0.063 | 0.024 | 0.016 | 0.053 |
| | N | | 9 | 9 | 9 | 9 | 9 | 9 |
| 3F | Mean | | 0.74 | 6.87 | 0.23 | 0.14 | 0.03 | 0.06 |
| | SD | | 0.320 | 2.173 | 0.086 | 0.031 | 0.012 | 0.031 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 |
| 4F | Mean | | 1.09 | 6.75 | 0.17 | 0.10 | 0.03 | 0.07 |
| | SD | | 0.722 | 1.417 | 0.058 | 0.015 | 0.012 | 0.032 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 8 Coagulation - group mean values

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Occasion Termination | PT Seconds | APTT Seconds |
|---|---|---|---|---|
| 1M | Mean | | 16.5 | 17.6 |
| | SD | | 0.69 | 2.01 |
| | N | | 7 | 7 |
| 2M | Mean | | 16.2 | 16.6 |
| | SD | | 0.81 | 3.03 |
| | N | | 8 | 8 |
| 3M | Mean | | 16.4 | 18.3 |
| | SD | | 0.60 | 2.83 |
| | N | | 7 | 7 |
| 4M | Mean | | 16.5 | 17.0 |
| | SD | | 0.29 | 2.75 |
| | N | | 7 | 7 |

TABLE 8 (cont) Coagulation - group mean values

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Occasion Termination | PT Seconds | APTT Seconds |
|---|---|---|---|---|
| 1F | Mean | | 14.4 | 17.6 |
| | SD | | 0.43 | 2.36 |
| | N | | 9 | 9 |
| 2F | Mean | | 14.7 | 15.4 |
| | SD | | 0.57 | 1.97 |
| | N | | 9 | 9 |
| 3F | Mean | | 14.8 | 16.9 |
| | SD | | 0.35 | 1.92 |
| | N | | 10 | 10 |
| 4F | Mean | | 14.6 | 15.8 |
| | SD | | 0.36 | 1.75 |
| | N | | 10 | 10 |

TABLE 9 Clinical chemistry - group mean values

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Occasion Week 5 | AST U/L | ALT U/L | ALKP U/L | BUN mg/dL | CREAT mg/dL | GLU mg/dL | CHOL mg/dL | TRIG mg/dL | TP g/dL | ALB g/dL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | Mean | | 125 | 59 | 247 | 19 | 0.2 | 95 | 81 | 90 | 6.3 | 4.2 |
| | SD | | 27.3 | 7.2 | 44.2 | 5.3 | 0.00 | 11.5 | 12.0 | 34.3 | 0.24 | 0.13 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2M | Mean | | 121 | 58 | 232 | 17 | 0.2 | 96 | 86 | 106 | 6.4 | 4.2 |
| | SD | | 17.2 | 8.4 | 62.3 | 3.1 | 0.03 | 10.7 | 14.4 | 34.9 | 0.34 | 0.23 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3M | Mean | | 112 | 60 | 245 | 17 | 0.2 | 92 | 88 | 110 | 6.3 | 4.3 |
| | SD | | 22.9 | 7.9 | 28.6 | 4.7 | 0.04 | 5.2 | 15.4 | 55.0 | 0.36 | 0.24 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | | 111 | 59 | 235 | 17 | 0.2* | 88 | 90 | 103 | 6.5 | 4.3 |
| | SD | | 14.9 | 7.5 | 42.5 | 1.4 | 0.05 | 9.6 | 13.2 | 38.8 | 0.38 | 0.24 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 9 (cont) Clinical chemistry - group mean values

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Occasion Week 5 | Glob g/dL | A/G | TBILI mg/dL | Na+ mEq/L | K+ mEq/L | Cl- mEq/L | Ca++ mg/dL | PHOS mg/dL |
|---|---|---|---|---|---|---|---|---|---|---|
| 1M | Mean | | 2.1 | 2.0 | | 142 | 5.7 | 100 | 11.0 | 9.2 |
| | SD | | 0.15 | 0.16 | | 0.7 | 0.32 | 1.7 | 0.25 | 0.77 |
| | N | | 10 | 10 | | 10 | 10 | 10 | 10 | 10 |
| 2M | Mean | | 2.1 | 2.0 | | 141 | 5.3* | 100 | 11.4* | 8.9 |
| | SD | | 0.15 | 0.10 | | 3.1 | 0.36 | 2.0 | 0.42 | 0.45 |
| | N | | 10 | 10 | | 10 | 10 | 10 | 10 | 10 |
| 3M | Mean | | 2.1 | 2.1 | | 142 | 5.2** | 100 | 11.6** | 8.9 |
| | SD | | 0.15 | 0.11 | | 0.8 | 0.30 | 1.4 | 0.35 | 0.57 |
| | N | | 10 | 10 | | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | | 2.2 | 2.0 | | 142 | 5.2** | 100 | 11.3** | 8.8 |
| | SD | | 0.19 | 0.16 | | 3.4 | 0.45 | 2.5 | 0.36 | 0.70 |
| | N | | 10 | 10 | | 10 | 10 | 10 | 10 | 10 |

TABLE 9 (cont) Clinical chemistry - group mean values

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Occasion Termination | AST U/L | ALT U/L | ALKP U/L | BUN mg/dL | CREAT mg/dL | GLU mg/dL | CHOL mg/dL | TRIG mg/dL | TP g/dL | ALB g/dL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | Mean | | 102 | 40 | 89 | 16 | 0.3 | 126 | 62 | 82 | 5.9 | 3.7 |
| | SD | | 26.4 | 8.5 | 18.3 | 1.3 | 0.11 | 23.6 | 11.7 | 64.9 | 0.30 | 0.13 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2M | Mean | | 108 | 37 | 83 | 15 | 0.2 | 136 | 62 | 57 | 5.9 | 3.7 |
| | SD | | 24.2 | 6.5 | 23.2 | 1.9 | 0.07 | 19.0 | 11.2 | 14.6 | 0.29 | 0.17 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3M | Mean | | 81 | 36 | 89 | 14* | 0.3 | 132 | 64 | 80 | 5.9 | 3.8 |
| | SD | | 7.7 | 9.7 | 15.3 | 1.3 | 0.05 | 15.2 | 20.3 | 55.6 | 0.34 | 0.19 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | | 95 | 38 | 80 | 15* | 0.3 | 126 | 66 | 67 | 6.1 | 3.8 |
| | SD | | 23.2 | 8.0 | 12.8 | 1.5 | 0.06 | 21.2 | 13.4 | 28.6 | 0.25 | 0.19 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 9 (cont) Clinical chemistry - group mean values

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Occasion Termination | Glob g/dL | A/G | TBILI mg/dL | Na+ mEq/L | K+ mEq/L | Cl- mEq/L | Ca++ mg/dL | PHOS mg/dL |
|---|---|---|---|---|---|---|---|---|---|---|
| 1M | Mean | | 2.2 | 1.7 | | 145 | 5.1 | 103 | 10.2 | 7.4 |
| | SD | | 0.23 | 0.17 | | 1.2 | 0.32 | 1.3 | 0.31 | 1.00 |
| | N | | 10 | 10 | | 10 | 10 | 10 | 10 | 10 |
| 2M | Mean | | 2.2 | 1.7 | | 145 | 5.2 | 104 | 10.5 | 7.2 |
| | SD | | 0.14 | 0.06 | | 0.6 | 0.27 | 1.4 | 0.46 | 0.41 |
| | N | | 10 | 10 | | 10 | 10 | 10 | 10 | 10 |
| 3M | Mean | | 2.1 | 1.8 | | 145 | 4.9 | 104 | 10.3 | 7.2 |
| | SD | | 0.18 | 0.10 | | 0.9 | 0.29 | 1.2 | 0.28 | 0.32 |
| | N | | 10 | 10 | | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | | 2.3 | 1.7 | | 145 | 5.1 | 103 | 10.5 | 7.2 |
| | SD | | 0.13 | 0.13 | | 0.5 | 0.28 | 1.4 | 0.51 | 0.47 |
| | N | | 10 | 10 | | 10 | 10 | 10 | 10 | 10 |

TABLE 9 (cont) Clinical chemistry - group mean values

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Occasion Week 5 | AST U/L | ALT U/L | ALKP U/L | BUN mg/dL | CREAT mg/dL | GLU mg/dL | CHOL mg/dL | TRIG mg/dL | TP g/dL | ALB g/dL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | Mean | | 114 | 52 | 158 | 22 | 0.3 | 102 | 108 | 68 | 6.9 | 4.6 |
| | SD | | 20.1 | 8.4 | 30.4 | 5.4 | 0.06 | 10.7 | 9.0 | 14.7 | 0.49 | 0.29 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2F | Mean | | 125 | 64 | 146 | 22 | 0.3 | 99 | 90 | 71 | 6.6 | 4.5 |
| | SD | | 32.3 | 9.7 | 38.5 | 3.4 | 0.06 | 12.3 | 19.3 | 17.5 | 0.42 | 0.28 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3F | Mean | | 110 | 54 | 142 | 18 | 0.3 | 103 | 97 | 90 | 6.8 | 4.6 |
| | SD | | 22.3 | 8.1 | 23.3 | 3.8 | 0.07 | 5.2 | 12.7 | 26.7 | 0.16 | 0.14 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4F | Mean | | 133 | 58 | 150 | 22 | 0.3 | 94 | 96 | 75 | 6.8 | 4.6 |
| | SD | | 27.8 | 12.3 | 27.5 | 3.6 | 0.00 | 4.4 | 17.6 | 16.5 | 0.44 | 0.31 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 9 (cont) Clinical chemistry - group mean values

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Occasion Week 5 | Glob g/dL | A/G | TBILI mg/dL | Na+ mEq/L | K+ mEq/L | Cl- mEq/L | Ca++ mg/dL | PHOS mg/dL |
|---|---|---|---|---|---|---|---|---|---|---|
| 1F | Mean | | 2.3 | 2.0 | | 142 | 4.9 | 100 | 11.1 | 7.7 |
| | SD | | 0.25 | 0.16 | | 1.1 | 0.34 | 1.6 | 0.35 | 0.41 |
| | N | | 10 | 10 | | 10 | 10 | 10 | 10 | 10 |
| 2F | Mean | | 2.1 | 2.1 | | 142 | 5.3* | 101 | 11.5 | 8.3 |
| | SD | | 0.18 | 0.15 | | 0.9 | 0.36 | 0.7 | 0.43 | 0.55 |
| | N | | 10 | 10 | | 10 | 10 | 10 | 10 | 10 |
| 3F | Mean | | 2.2 | 2.1 | | 141 | 5.2* | 100 | 11.4 | 7.7 |
| | SD | | 0.12 | 0.15 | | 0.8 | 0.16 | 1.9 | 0.34 | 0.57 |
| | N | | 10 | 10 | | 10 | 10 | 10 | 10 | 10 |
| 4F | Mean | | 2.2 | 2.1 | | 141 | 5.2* | 100 | 11.4 | 8.2* |
| | SD | | 0.14 | 0.07 | | 0.5 | 0.39 | 1.2 | 0.53 | 0.54 |
| | N | | 10 | 10 | | 10 | 10 | 10 | 10 | 10 |

TABLE 9 (cont) Clinical chemistry - group mean values

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Occasion Termination | AST U/L | ALT U/L | ALKP U/L | BUN mg/dL | CREAT mg/dL | GLU mg/dL | CHOL mg/dL | TRIG mg/dL | TP g/dL | ALB g/dL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | Mean | | 121 | 44 | 59 | 19 | 0.4 | 122 | 100 | 82 | 6.9 | 4.4 |
| | SD | | 64.6 | 21.8 | 13.6 | 3.4 | 0.08 | 19.5 | 14.1 | 13.5 | 0.40 | 0.27 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2F | Mean | | 128 | 40 | 46 | 17 | 0.3 | 113 | 83* | 68 | 6.6* | 4.2 |
| | SD | | 28.4 | 12.5 | 14.0 | 1.6 | 0.07 | 23.9 | 15.8 | 12.8 | 0.25 | 0.17 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3F | Mean | | 115 | 32 | 49 | 17 | 0.4 | 117 | 91* | 86 | 7.0 | 4.5 |
| | SD | | 22.3 | 8.1 | 11.8 | 3.7 | 0.08 | 9.7 | 13.2 | 17.8 | 0.25 | 0.21 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4F | Mean | | 115 | 39 | 50 | 17 | 0.3 | 117 | 83** | 76 | 6.7 | 4.3 |
| | SD | | 18.6 | 9.8 | 10.4 | 2.8 | 0.10 | 15.0 | 7.9 | 26.4 | 0.30 | 0.24 |
| | N | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 9 (cont) Clinical chemistry - group mean values

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | | Occasion Termination | Glob g/dL | A/G | TBILI mg/dL | Na+ mEq/L | K+ mEq/L | Cl- mEq/L | Ca++ mg/dL | PHOS mg/dL |
|---|---|---|---|---|---|---|---|---|---|---|
| 1F | Mean | | 2.5 | 1.8 | | 143 | 4.3 | 103 | 10.3 | 5.7 |
| | SD | | 0.20 | 0.12 | | 1.3 | 0.36 | 0.9 | 0.37 | 1.28 |
| | N | | 10 | 10 | | 10 | 10 | 10 | 10 | 10 |
| 2F | Mean | | 2.3 | 1.8 | | 143 | 4.6 | 103 | 10.5 | 7.1* |
| | SD | | 0.12 | 0.08 | | 1.2 | 0.15 | 1.4 | 0.31 | 0.56 |
| | N | | 10 | 10 | | 10 | 10 | 10 | 10 | 10 |
| 3F | Mean | | 2.5 | 1.8 | | 142 | 4.5 | 102 | 10.9** | 6.7* |
| | SD | | 0.12 | 0.12 | | 0.6 | 0.23 | 0.4 | 0.25 | 0.60 |
| | N | | 10 | 10 | | 10 | 10 | 10 | 10 | 10 |
| 4F | Mean | | 2.4 | 1.8 | | 143 | 4.5 | 102 | 10.7** | 6.4* |
| | SD | | 0.14 | 0.13 | | 0.6 | 0.25 | 1.2 | 0.34 | 0.82 |
| | N | | 10 | 10 | | 10 | 10 | 10 | 10 | 10 |

TABLE 10 Organ weights - group mean absolute values (g) - terminal sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | | Terminal Body weight | Adrenals | Brain | Epididymides | Heart | Kidneys | Liver | Lungs and Bronchi | Pituitary | Spleen |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Statistics test | | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi |
| 1M | Mean | 487.4 | 0.0625 | 2.1807 | 1.5610 | 1.5735 | 2.9362 | 11.0666 | 1.6848 | 0.0141 | 0.8904 |
| | SD | 52.2 | 0.0077 | 0.1115 | 0.1321 | 0.1907 | 0.5366 | 2.3935 | 0.1256 | 0.0010 | 0.1339 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2M | Mean | 486.6 | 0.0610 | 2.2177 | 1.6195 | 1.6165 | 3.0566 | 11.2055 | 1.6987 | 0.0138 | 0.8649 |
| | SD | 45.0 | 0.0071 | 0.1109 | 0.1909 | 0.2370 | 0.4177 | 1.7660 | 0.1409 | 0.0018 | 0.1549 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3M | Mean | 505.9 | 0.0565 | 2.2429 | 1.5658 | 1.6893 | 3.2338 | 11.7699 | 1.7129 | 0.0150 | 1.0465 |
| | SD | 57.2 | 0.0102 | 0.0707 | 0.2868 | 0.2577 | 0.4583 | 2.1420 | 0.1748 | 0.0014 | 0.1986 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | 488.8 | 0.0585 | 2.1929 | 1.6260 | 1.6719 | 3.2177 | 11.7286 | 1.6463 | 0.0152 | 0.9333 |
| | SD | 53.6 | 0.0070 | 0.1078 | 0.1517 | 0.2512 | 0.2419 | 1.8829 | 0.1760 | 0.0016 | 0.1746 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 10 (cont) Organ weights - group mean absolute values (g) - terminal sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | | Testes | Thymus | Thyroids and Parathyroids | Prostate and Seminal Vesicles |
|---|---|---|---|---|---|
| Statistics test | | Wi | Wi | Wi | Wi |
| 1M | Mean | 3.5502 | 0.4142 | 0.0223 | 3.5150 |
| | SD | 0.3194 | 0.1137 | 0.0043 | 0.4972 |
| | N | 10 | 10 | 10 | 10 |
| 2M | Mean | 3.5246 | 0.4104 | 0.0237 | 3.6582 |
| | SD | 0.3431 | 0.1028 | 0.0040 | 0.4295 |
| | N | 10 | 10 | 10 | 10 |
| 3M | Mean | 3.5583 | 0.4268 | 0.0251 | 3.9994 |
| | SD | 0.4675 | 0.1019 | 0.0031 | 0.4948 |
| | N | 10 | 10 | 10 | 10 |
| 4M | Mean | 3.5931 | 0.4416 | 0.0236 | 3.7463 |
| | SD | 0.2343 | 0.1006 | 0.0026 | 0.6418 |
| | N | 10 | 10 | 10 | 10 |

TABLE 10 (cont) Organ weights - group mean absolute values (g) - terminal sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | | Terminal Body weight | Adrenals | Brain | Heart | Kidneys | Liver | Lungs and Bronchi | Ovaries | Pituitary | Spleen |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Statistics | test | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi |
| 1F | Mean | 282.7 | 0.0562 | 1.9788 | 1.0555 | 1.6945 | 7.1090 | 1.2787 | 0.1011 | 0.0208 | 0.6212 |
| | SD | 16.4 | 0.0095 | 0.0685 | 0.0596 | 0.2070 | 0.5861 | 0.1051 | 0.0258 | 0.0030 | 0.1403 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2F | Mean | 281.6 | 0.0583 | 1.9408 | 1.0329 | 1.6585 | 6.8725 | 1.3118 | 0.0875 | 0.0196 | 0.6169 |
| | SD | 9.1 | 0.0089 | 0.1100 | 0.1360 | 0.1777 | 0.6155 | 0.0700 | 0.0106 | 0.0031 | 0.0969 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3F | Mean | 293.3 | 0.0582 | 2.0247 | 1.0270 | 1.7743 | 7.5074 | 1.3484 | 0.0901 | 0.0188 | 0.6106 |
| | SD | 15.8 | 0.0079 | 0.1259 | 0.0656 | 0.1475 | 0.5477 | 0.0915 | 0.0165 | 0.0044 | 0.0812 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4F | Mean | 277.3 | 0.0544 | 2.0259 | 1.0888 | 1.7893 | 6.8495 | 1.2847 | 0.0906 | 0.0200 | 0.6362 |
| | SD | 22.5 | 0.0056 | 0.0992 | 0.1202 | 0.1633 | 0.6726 | 0.1059 | 0.0135 | 0.0022 | 0.0857 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 10 (cont) Organ weights - group mean absolute values (g) - terminal sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | | Thymus | Thyroids and Parathyroids | Uterus and Cervix |
|---|---|---|---|---|
| Statistics test | | lWi | Du | Wi |
| 1F | Mean | 0.3741 | 0.0216 | 0.9004 |
| | SD | 0.0875 | 0.0025 | 0.2710 |
| | N | 10 | 10 | 10 |
| 2F | Mean | 0.3517 | 0.0246 | 0.8254 |
| | SD | 0.1085 | 0.0033 | 0.4029 |
| | N | 10 | 10 | 10 |
| 3F | Mean | 0.4385 | 0.0182 | 0.8953 |
| | SD | 0.2992 | 0.0028 | 0.3292 |
| | N | 10 | 10 | 10 |
| 4F | Mean | 0.3238 | 0.0212 | 1.0643 |
| | SD | 0.0677 | 0.0044 | 0.2998 |
| | N | 10 | 10 | 10 |

TABLE 10 (cont) Organ weights - group mean absolute values (g) - recovery sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | | Terminal Body weight | Adrenals | Brain | Epididymides | Heart | Kidneys | Liver | Lungs and Bronchi | Pituitary | Spleen |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Statistics test | | Tt | Tt | Tt | Tt | Tt | Tt | Tt | Tt | Tt | Tt |
| 1M | Mean | 513.3 | 0.0567 | 2.2879 | 1.6342 | 1.5769 | 3.1646 | 11.3408 | 1.6545 | 0.0153 | 0.9444 |
| | SD | 46.5 | 0.0098 | 0.1106 | 0.1897 | 0.1933 | 0.4260 | 1.4561 | 0.0797 | 0.0032 | 0.1869 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | 494.5 | 0.0476* | 2.2125 | 1.3845** | 1.5292 | 2.9658 | 11.2287 | 1.5630 | 0.0151 | 0.8261 |
| | SD | 57.5 | 0.0044 | 0.0939 | 0.0939 | 0.2157 | 0.4111 | 1.9996 | 0.1227 | 0.0022 | 0.1492 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 10 (cont) Organ weights - group mean absolute values (g) - recovery sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | | Testes | Thymus | Thyroids and Parathyroids | Prostate and Seminal Vesicles |
|---|---|---|---|---|---|
| Statistics | test | Tt | Tt | Tt | Tt |
| 1M | Mean | 3.7369 | 0.3595 | 0.0227 | 3.8186 |
| | SD | 0.2513 | 0.1511 | 0.0039 | 0.4085 |
| | N | 10 | 10 | 10 | 10 |
| 4M | Mean | 3.4748 | 0.2548 | 0.0247 | 3.8271 |
| | SD | 0.3679 | 0.0972 | 0.0051 | 0.4217 |
| | N | 10 | 10 | 10 | 10 |

TABLE 10 (cont) Organ weights - group mean absolute values (g) - recovery sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | | Terminal Body weight | Adrenals | Brain | Heart | Kidneys | Liver | Lungs and Bronchi | Ovaries | Pituitary | Spleen |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Statistics test | | Tt | Tt | Tt | Tt | Tt | Tt | Tt | Tt | Tt | Tt |
| 1F | Mean | 309.1 | 0.0570 | 2.0485 | 1.0036 | 1.8751 | 7.3925 | 1.2692 | 0.0845 | 0.0204 | 0.5615 |
| | SD | 25.1 | 0.0085 | 0.0731 | 0.0791 | 0.1246 | 0.6712 | 0.0789 | 0.0145 | 0.0036 | 0.0911 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4F | Mean | 300.5 | 0.0566 | 2.0706 | 1.1777* | 2.0607* | 7.4368 | 1.3616 | 0.0906 | 0.0221 | 0.6468 |
| | SD | 21.4 | 0.0074 | 0.1060 | 0.1889 | 0.2260 | 0.6986 | 0.1385 | 0.0143 | 0.0040 | 0.1212 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 10 (cont) Organ weights - group mean absolute values (g) - recovery sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | | Thymus | Thyroids and Parathyroids | Uterus and Cervix |
|---|---|---|---|---|
| Statistics | test | Tt | Tt | lTt |
| 1F | Mean | 0.2470 | 0.0241 | 1.0227 |
| | SD | 0.0557 | 0.0038 | 0.4170 |
| | N | 10 | 10 | 10 |
| 4F | Mean | 0.2965 | 0.0221 | 0.7814 |
| | SD | 0.1023 | 0.0043 | 0.1375 |
| | N | 10 | 10 | 10 |

TABLE 11 Organ weights - group mean values relative (%) to body weight (g) - terminal sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | | Terminal Body weight | Adrenals | Brain | Epididymides | Heart | Kidneys | Liver | Lungs and Bronchi | Pituitary | Spleen |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Statistics test | | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi |
| 1M | Mean | 487.4 | 0.0129 | 0.451 | 0.322 | 0.325 | 0.606 | 2.25 | 0.347 | 0.0029 | 0.182 |
| | SD | 52.2 | 0.0014 | 0.042 | 0.033 | 0.045 | 0.115 | 0.25 | 0.026 | 0.0003 | 0.018 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2M | Mean | 486.6 | 0.0127 | 0.459 | 0.334 | 0.332 | 0.627 | 2.29 | 0.350 | 0.0028 | 0.178 |
| | SD | 45.0 | 0.0020 | 0.047 | 0.038 | 0.038 | 0.048 | 0.17 | 0.021 | 0.0003 | 0.028 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3M | Mean | 505.9 | 0.0112 | 0.447 | 0.309 | 0.334 | 0.639 | 2.31 | 0.340 | 0.0030 | 0.207 |
| | SD | 57.2 | 0.0018 | 0.041 | 0.039 | 0.034 | 0.050 | 0.19 | 0.031 | 0.0004 | 0.036 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | 488.8 | 0.0122 | 0.452 | 0.335 | 0.342 | 0.665 | 2.39 | 0.338 | 0.0031 | 0.192 |
| | SD | 53.6 | 0.0025 | 0.040 | 0.031 | 0.038 | 0.085 | 0.15 | 0.032 | 0.0005 | 0.036 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 11 (cont) Organ weights - group mean values relative (%) to body weight (g) - terminal sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | | Terminal Body weight | Testes | Thymus | Thyroids and Parathyroids | Prostate and Seminal Vesicles |
|---|---|---|---|---|---|---|
| Statistics test | | Wi | Wi | Wi | Wi | Wi |
| 1M | Mean | 487.4 | 0.734 | 0.0856 | 0.0046 | 0.724 |
| | SD | 52.2 | 0.084 | 0.0243 | 0.0007 | 0.095 |
| | N | 10 | 10 | 10 | 10 | 10 |
| 2M | Mean | 486.6 | 0.728 | 0.0846 | 0.0048 | 0.754 |
| | SD | 45.0 | 0.082 | 0.0211 | 0.0006 | 0.085 |
| | N | 10 | 10 | 10 | 10 | 10 |
| 3M | Mean | 505.9 | 0.708 | 0.0849 | 0.0050 | 0.792 |
| | SD | 57.2 | 0.103 | 0.0194 | 0.0007 | 0.067 |
| | N | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | 488.8 | 0.742 | 0.0909 | 0.0049 | 0.771 |
| | SD | 53.6 | 0.079 | 0.0210 | 0.0008 | 0.126 |
| | N | 10 | 10 | 10 | 10 | 10 |

TABLE 11 (cont) Organ weights - group mean values relative (%) to body weight (g) - terminal sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | | Terminal Body weight | Adrenals | Brain | Heart | Kidneys | Liver | Lungs and Bronchi | Ovaries | Pituitary | Spleen |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Statistics | test | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi |
| 1F | Mean | 282.7 | 0.0198 | 0.702 | 0.374 | 0.600 | 2.51 | 0.453 | 0.0358 | 0.0073 | 0.219 |
| | SD | 16.4 | 0.0026 | 0.042 | 0.023 | 0.073 | 0.13 | 0.032 | 0.0088 | 0.0010 | 0.042 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2F | Mean | 281.6 | 0.0207 | 0.690 | 0.367 | 0.588 | 2.44 | 0.466 | 0.0311 | 0.0069 | 0.219 |
| | SD | 9.1 | 0.0028 | 0.045 | 0.044 | 0.056 | 0.17 | 0.028 | 0.0039 | 0.0011 | 0.031 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3F | Mean | 293.3 | 0.0199 | 0.693 | 0.351 | 0.606 | 2.56 | 0.461 | 0.0309 | 0.0064 | 0.208 |
| | SD | 15.8 | 0.0028 | 0.065 | 0.034 | 0.051 | 0.21 | 0.043 | 0.0062 | 0.0015 | 0.025 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4F | Mean | 277.3 | 0.0196 | 0.735 | 0.394 | 0.646 | 2.47 | 0.464 | 0.0327 | 0.0073 | 0.231 |
| | SD | 22.5 | 0.0015 | 0.065 | 0.049 | 0.040 | 0.12 | 0.034 | 0.0042 | 0.0010 | 0.039 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 11 (cont) Organ weights - group mean values relative (%) to body weight (g) - terminal sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | | Terminal Body weight | Thymus | Thyroids and Parathyroids | Uterus and Cervix |
|---|---|---|---|---|---|
| Statistics | test | Wi | lWi | Du | Wi |
| 1F | Mean | 282.7 | 0.131 | 0.0077 | 0.321 |
| | SD | 16.4 | 0.026 | 0.0009 | 0.107 |
| | N | 10 | 10 | 10 | 10 |
| 2F | Mean | 281.6 | 0.125 | 0.0087 | 0.292 |
| | SD | 9.1 | 0.040 | 0.0011 | 0.139 |
| | N | 10 | 10 | 10 | 10 |
| 3F | Mean | 293.3 | 0.148 | 0.0062* | 0.304 |
| | SD | 15.8 | 0.093 | 0.0008 | 0.106 |
| | N | 10 | 10 | 10 | 10 |
| 4F | Mean | 277.3 | 0.117 | 0.0077 | 0.390 |
| | SD | 22.5 | 0.021 | 0.0017 | 0.126 |
| | N | 10 | 10 | 10 | 10 |

TABLE 11 (cont) Organ weights - group mean values relative (%) to body weight (g) - recovery sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | | Terminal Body weight | Adrenals | Brain | Epididymides | Heart | Kidneys | Liver | Lungs and Bronchi | Pituitary | Spleen |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Statistics test | | Tt | Tt | Tt | Tt | Tt | Tt | Tt | Tt | Tt | Tt |
| 1M | Mean | 513.3 | 0.0111 | 0.448 | 0.320 | 0.309 | 0.616 | 2.21 | 0.324 | 0.0030 | 0.183 |
| | SD | 46.5 | 0.0018 | 0.037 | 0.045 | 0.043 | 0.054 | 0.21 | 0.025 | 0.0005 | 0.029 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | 494.5 | 0.0097* | 0.452 | 0.283 | 0.310 | 0.600 | 2.26 | 0.318 | 0.0031 | 0.166 |
| | SD | 57.5 | 0.0009 | 0.041 | 0.035 | 0.035 | 0.052 | 0.18 | 0.024 | 0.0004 | 0.017 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 11 (cont) Organ weights - group mean values relative (%) to body weight (g) - recovery sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | | Terminal Body weight | Testes | Thymus | Thyroids and Parathyroids | Prostate and Seminal Vesicles |
|---|---|---|---|---|---|---|
| Statistics test | | Tt | Tt | Tt | Tt | Tt |
| 1M | Mean | 513.3 | 0.733 | 0.0697 | 0.0045 | 0.748 |
| | SD | 46.5 | 0.079 | 0.0274 | 0.0010 | 0.096 |
| | N | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | 494.5 | 0.706 | 0.0529 | 0.0050 | 0.779 |
| | SD | 57.5 | 0.063 | 0.0230 | 0.0010 | 0.088 |
| | N | 10 | 10 | 10 | 10 | 10 |

TABLE 11 (cont) Organ weights - group mean values relative (%) to body weight (g) - recovery sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | | Terminal Body weight | Adrenals | Brain | Heart | Kidneys | Liver | Lungs and Bronchi | Ovaries | Pituitary | Spleen |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Statistics | test | Tt | Tt | Tt | Tt | Tt | Tt | Tt | Tt | Tt | Tt |
| 1F | Mean | 309.1 | 0.0185 | 0.667 | 0.326 | 0.609 | 2.40 | 0.412 | 0.0272 | 0.0066 | 0.182 |
| | SD | 25.1 | 0.0024 | 0.064 | 0.034 | 0.048 | 0.19 | 0.033 | 0.0031 | 0.0010 | 0.029 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4F | Mean | 300.5 | 0.0189 | 0.691 | 0.393** | 0.686** | 2.47 | 0.453* | 0.0303 | 0.0074 | 0.214* |
| | SD | 21.4 | 0.0025 | 0.048 | 0.063 | 0.060 | 0.13 | 0.030 | 0.0051 | 0.0015 | 0.030 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 11 (cont) Organ weights - group mean values relative (%) to body weight (g) - recovery sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | | Terminal Body weight | Thymus | Thyroids and Parathyroids | Uterus and Cervix |
|---|---|---|---|---|---|
| Statistics test | | Tt | Tt | Tt | lTt |
| 1F | Mean | 309.1 | 0.0801 | 0.0078 | 0.335 |
| | SD | 25.1 | 0.0168 | 0.0013 | 0.146 |
| | N | 10 | 10 | 10 | 10 |
| 4F | Mean | 300.5 | 0.0979 | 0.0073 | 0.260 |
| | SD | 21.4 | 0.0292 | 0.0013 | 0.044 |
| | N | 10 | 10 | 10 | 10 |

TABLE 12 Organ weights - group mean values relative (%) to brain weight (g) - terminal sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | | Brain | Adrenals | Epididymides | Heart | Kidneys | Liver | Lungs and Bronchi | Pituitary | Spleen | Testes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Statistics | test | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi |
| 1M | Mean | 2.1807 | 2.87 | 71.7 | 72.1 | 135 | 507 | 77.3 | 0.649 | 40.8 | 163 |
| | SD | 0.1115 | 0.35 | 5.7 | 7.6 | 26 | 104 | 5.8 | 0.044 | 5.9 | 14 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2M | Mean | 2.2177 | 2.76 | 73.0 | 72.8 | 138 | 507 | 76.8 | 0.625 | 39.0 | 159 |
| | SD | 0.1109 | 0.35 | 7.1 | 9.3 | 20 | 85 | 7.3 | 0.090 | 6.9 | 12 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3M | Mean | 2.2429 | 2.51 | 69.7 | 75.1 | 144 | 523 | 76.4 | 0.668 | 46.6 | 159 |
| | SD | 0.0707 | 0.40 | 12.0 | 9.4 | 18 | 83 | 7.4 | 0.060 | 8.2 | 21 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | 2.1929 | 2.67 | 74.2 | 76.1 | 147 | 533 | 75.0 | 0.694 | 42.6 | 164 |
| | SD | 0.1078 | 0.36 | 6.2 | 9.3 | 10 | 67 | 6.1 | 0.071 | 7.7 | 11 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 12 (cont) Organ weights - group mean values relative (%) to brain weight (g) - terminal sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | | Brain | Thymus | Thyroids and Parathyroids | Prostate and Seminal Vesicles |
|---|---|---|---|---|---|
| Statistics test | | Wi | Wi | Wi | Wi |
| 1M | Mean | 2.1807 | 19.0 | 1.02 | 161 |
| | SD | 0.1115 | 5.3 | 0.17 | 20 |
| | N | 10 | 10 | 10 | 10 |
| 2M | Mean | 2.2177 | 18.6 | 1.07 | 165 |
| | SD | 0.1109 | 5.1 | 0.18 | 17 |
| | N | 10 | 10 | 10 | 10 |
| 3M | Mean | 2.2429 | 19.0 | 1.12 | 178 |
| | SD | 0.0707 | 4.6 | 0.14 | 19 |
| | N | 10 | 10 | 10 | 10 |
| 4M | Mean | 2.1929 | 20.2 | 1.08 | 170 |
| | SD | 0.1078 | 4.7 | 0.14 | 23 |
| | N | 10 | 10 | 10 | 10 |

TABLE 12 (cont) Organ weights - group mean values relative (%) to brain weight (g) - terminal sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | | Brain | Adrenals | Heart | Kidneys | Liver | Lungs and Bronchi | Ovaries | Pituitary | Spleen | Thymus |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Statistics | test | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | Wi | lWi |
| 1F | Mean | 1.9788 | 2.83 | 53.4 | 85.6 | 359 | 64.6 | 5.12 | 1.049 | 31.3 | 18.9 |
| | SD | 0.0685 | 0.43 | 4.3 | 9.4 | 27 | 4.4 | 1.39 | 0.144 | 6.6 | 4.5 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2F | Mean | 1.9408 | 3.02 | 53.2 | 85.4 | 354 | 67.8 | 4.54 | 1.004 | 31.8 | 18.2 |
| | SD | 0.1100 | 0.55 | 5.5 | 7.6 | 26 | 5.6 | 0.74 | 0.133 | 5.0 | 5.8 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3F | Mean | 2.0247 | 2.89 | 50.9 | 87.7 | 372 | 66.8 | 4.47 | 0.926 | 30.2 | 21.5 |
| | SD | 0.1259 | 0.47 | 4.5 | 6.0 | 34 | 5.4 | 0.88 | 0.209 | 3.9 | 14.1 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4F | Mean | 2.0259 | 2.69 | 53.9 | 88.5 | 339 | 63.5 | 4.49 | 0.994 | 31.6 | 16.0 |
| | SD | 0.0992 | 0.32 | 7.2 | 8.7 | 40 | 5.4 | 0.74 | 0.148 | 5.1 | 3.2 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 12 (cont) Organ weights - group mean values relative (%) to brain weight (g) - terminal sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | | Brain | Thyroids and Parathyroids | Uterus and Cervix |
|---|---|---|---|---|
| Statistics test | | Wi | Wi | Wi |
| 1F | Mean | 1.9788 | 1.10 | 45.5 |
| | SD | 0.0685 | 0.16 | 13.8 |
| | N | 10 | 10 | 10 |
| 2F | Mean | 1.9408 | 1.27 | 42.2 |
| | SD | 0.1100 | 0.20 | 19.4 |
| | N | 10 | 10 | 10 |
| 3F | Mean | 2.0247 | 0.90 | 45.0 |
| | SD | 0.1259 | 0.17 | 19.2 |
| | N | 10 | 10 | 10 |
| 4F | Mean | 2.0259 | 1.05 | 52.9 |
| | SD | 0.0992 | 0.23 | 16.2 |
| | N | 10 | 10 | 10 |

TABLE 12 (cont) Organ weights - group mean values relative (%) to brain weight (g) - recovery sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | | Brain | Adrenals | Epididymides | Heart | Kidneys | Liver | Lungs and Bronchi | Pituitary | Spleen | Testes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Statistics | test | Tt | Tt | Tt | Tt | Tt | Tt | Tt | Tt | Tt | Tt |
| 1M | Mean | 2.2879 | 2.47 | 71.7 | 69.1 | 138 | 495 | 72.4 | 0.669 | 41.3 | 164 |
| | SD | 0.1106 | 0.36 | 10.1 | 9.8 | 18 | 54 | 4.1 | 0.139 | 8.2 | 13 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4M | Mean | 2.2125 | 2.15* | 62.6* | 69.0 | 134 | 506 | 70.6 | 0.684 | 37.2 | 157 |
| | SD | 0.0939 | 0.15 | 4.1 | 7.9 | 15 | 78 | 3.7 | 0.096 | 5.6 | 13 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 12 (cont) Organ weights - group mean values relative (%) to brain weight (g) - recovery sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | | Brain | Thymus | Thyroids and Parathyroids | Prostate and Seminal Vesicles |
|---|---|---|---|---|---|
| Statistics test | | Tt | Tt | Tt | Tt |
| 1M | Mean | 2.2879 | 15.7 | 0.99 | 167 |
| | SD | 0.1106 | 6.4 | 0.18 | 21 |
| | N | 10 | 10 | 10 | 10 |
| 4M | Mean | 2.2125 | 11.6 | 1.12 | 173 |
| | SD | 0.0939 | 4.5 | 0.23 | 13 |
| | N | 10 | 10 | 10 | 10 |

TABLE 12 (cont) Organ weights - group mean values relative (%) to brain weight (g) - recovery sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | | Brain | Adrenals | Heart | Kidneys | Liver | Lungs and Bronchi | Ovaries | Pituitary | Spleen | Thymus |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Statistics test | | Tt | Tt | Tt | Tt | Tt | Tt | Tt | Tt | Tt | Tt |
| 1F | Mean | 2.0485 | 2.78 | 49.0 | 91.6 | 361 | 62.1 | 4.14 | 1.00 | 27.4 | 12.1 |
| | SD | 0.0731 | 0.41 | 4.0 | 6.7 | 35 | 5.0 | 0.78 | 0.18 | 4.4 | 3.0 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 4F | Mean | 2.0706 | 2.75 | 56.8* | 99.6 | 359 | 65.8 | 4.37 | 1.07 | 31.2 | 14.2 |
| | SD | 0.1060 | 0.42 | 8.0 | 10.7 | 29 | 5.8 | 0.55 | 0.18 | 5.6 | 4.5 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

TABLE 12 (cont) Organ weights - group mean values relative (%) to brain weight (g) - recovery sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | | Brain | Thyroids and Parathyroids | Uterus and Cervix |
|---|---|---|---|---|
| Statistics test | | Tt | Tt | lTt |
| 1F | Mean | 2.0485 | 1.18 | 49.7 |
| | SD | 0.0731 | 0.17 | 19.3 |
| | N | 10 | 10 | 10 |
| 4F | Mean | 2.0706 | 1.06 | 37.6 |
| | SD | 0.1060 | 0.17 | 5.7 |
| | N | 10 | 10 | 10 |

TABLE 13 Macropathology - group distribution of findings - terminal sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | Gasoline Isobutanol Vaport Condensate | | Positive Control | |
|---|---|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 | 5 | 6 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 | 20 | 50 |

| | | Number of animals affected | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group/Sex | 1M | 2M | 3M | 4M | 1F | 2F | 3F | 4F |
| Tissue/Organ and Findings | No. of animals | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Number of animals within normal limits | | 9 | 9 | 9 | 10 | 9 | 9 | 8 | 7 |
| Epididymides | | | | | | | | | |
| Soft | | 0 | 0 | 1 | 0 | - | - | - | - |
| Kidneys | | | | | | | | | |
| Adhesion(s) | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Dilated Pelvis | | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Lungs and Bronchi | | | | | | | | | |
| Incomplete deflation | | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Skin and Subcutis | | | | | | | | | |
| Mass(es) | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Scab(s) | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Stomach | | | | | | | | | |
| Dark area(s) | | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Testes | | | | | | | | | |
| Soft | | 0 | 0 | 1 | 0 | - | - | - | - |
| Thyroids | | | | | | | | | |
| Small | | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |

TABLE 13 (cont) Macropathology - group distribution of findings - recovery sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | Gasoline Isobutanol Vaport Condensate | | Positive Control | |
|---|---|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 | 5 | 6 |
| Dose ($mg/m^{3)}$ | | 2000 | 10000 | 20000 | 20 | 50 |

| | | Number of animals affected | | | |
|---|---|---|---|---|---|
| | Group/Sex | 1M | 4M | 1F | 4F |
| Tissue/Organ and Findings | No. of animals | 10 | 10 | 10 | 10 |
| Number of animals within normal limits | | 9 | 7 | 9 | 9 |
| Kidneys | | | | | |
| Depression(s) | | 0 | 1 | 0 | 0 |
| Dilated Pelvis | | 0 | 0 | 1 | 0 |
| Lungs and Bronchi | | | | | |
| Adhesions | | 1 | 0 | 0 | 0 |
| Lymph Node, Axillary | | | | | |
| Abnormal Color | | 0 | 0 | 0 | 1 |
| Thyroids | | | | | |
| Small | | 0 | 2 | 0 | 0 |

TABLE 14 Histopathology - group distribution of findings - terminal sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Number of animals affected | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group/Sex | 1M | 2M | 3M | 4M | 1F | 2F | 3F | 4F |
| Tissue/Organ and Findings | No. of animals | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Adrenals | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Aorta Thoracic | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Infiltrate, Inflammatory Cell | Minimal | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| | Total | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Bone Marrow, Femoral | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Bone Marrow, Sternal | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Bone, Femur Including Joint | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Bone, Sternum | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Brain | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Cecum | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |

TABLE 14 (cont) Histopathology - group distribution of findings - terminal sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Tissue/Organ and Findings | Group/Sex | Number of animals affected | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | No. of animals | 1M 10 | 2M 10 | 3M 10 | 4M 10 | 1F 10 | 2F 10 | 3F 10 | 4F 10 |
| Colon | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Parasites | Minimal | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| | Total | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Duodenum | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Epididymides | No. examined | 10 | 0 | 1 | 10 | - | - | - | - |
| Sperm, Reduced, Luminal | Moderate | 0 | 0 | 1 | 0 | - | - | - | - |
| | Total | 0 | 0 | 1 | 0 | - | - | - | - |
| Esophagus | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Eyes | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Rosettes/Folds, Retina | Minimal | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Harderian Glands | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Infiltrate, Inflammatory Cell | Minimal | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | Total | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

TABLE 14 (cont) Histopathology - group distribution of findings - terminal sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Number of animals affected | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group/Sex | 1M | 2M | 3M | 4M | 1F | 2F | 3F | 4F |
| Tissue/Organ and Findings | No. of animals | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Heart | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Cardiomyopathy, Chronic | Minimal | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| | Total | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| Ileum | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Jejunum | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Kidneys | No. examined | 10 | 0 | 0 | 10 | 10 | 1 | 0 | 10 |
| Nephropathy, Chronic Progressive | Minimal | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 1 |
| | Slight | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 |
| | Total | 2 | 0 | 0 | 7 | 0 | 0 | 0 | 1 |
| Infiltrate, Inflammatory Cell | Minimal | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 |
| | Total | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 |
| Accumulation, Hyaline Droplets | Minimal | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | Slight | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 |
| | Moderate | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| | Total | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 |

TABLE 14 (cont) Histopathology - group distribution of findings - terminal sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Number of animals affected | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group/Sex | 1M | 2M | 3M | 4M | 1F | 2F | 3F | 4F |
| Tissue/Organ and Findings | No. of animals | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Kidneys | No. examined | 10 | 0 | 0 | 10 | 10 | 1 | 0 | 10 |
| Infarction | Minimal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Dilatation, Pelvic | Minimal | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| | Moderate | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| | Total | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Lacrimal Glands | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Larynx | No. examined | 9 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Liver | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Infiltrate, Inflammatory Cell | Minimal | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lungs and Bronchi | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 1 | 10 |
| Metaplasia, Osseous, Alveolar | Minimal | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | Total | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

TABLE 14 (cont) Histopathology - group distribution of findings - terminal sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Number of animals affected | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group/Sex | 1M | 2M | 3M | 4M | 1F | 2F | 3F | 4F |
| Tissue/Organ and Findings | No. of animals | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Lungs and Bronchi | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 1 | 10 |
| Infiltrate, Inflammatory Cell | Minimal | 3 | 0 | 0 | 4 | 1 | 0 | 0 | 1 |
| | Total | 3 | 0 | 0 | 4 | 1 | 0 | 0 | 1 |
| Alveolar Macrophage Aggregation | Minimal | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 3 |
| | Total | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 3 |
| Lymph Node, Axillary | No. examined | 9 | 0 | 0 | 10 | 10 | 0 | 0 | 9 |
| Lymph Node, Mesenteric | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Lymph Node, Tracheobronchial | No. examined | 6 | 0 | 0 | 8 | 8 | 0 | 0 | 8 |
| Mammary | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| B-fibroadenoma | Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Nerve, Sciatic | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 9 |

TABLE 14 (cont) Histopathology - group distribution of findings - terminal sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Number of animals affected | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group/Sex | 1M | 2M | 3M | 4M | 1F | 2F | 3F | 4F |
| Tissue/Organ and Findings | No. of animals | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Nose/Turbinates | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Ovaries | No. examined | - | - | - | - | 10 | 0 | 0 | 10 |
| Pancreas | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Infiltrate, Inflammatory Cell | Minimal | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Total | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| Parathyroids | No. examined | 9 | 0 | 0 | 10 | 10 | 0 | 0 | 9 |
| Peyer's Patches/GALT | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Mineralization | Slight | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | Total | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Pharynx, Nasal | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Pituitary | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 8 |

TABLE 14 (cont) Histopathology - group distribution of findings - terminal sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Number of animals affected | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group/Sex | 1M | 2M | 3M | 4M | 1F | 2F | 3F | 4F |
| Tissue/Organ and Findings | No. of animals | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Prostate | No. examined | 10 | 0 | 0 | 10 | - | - | - | - |
| Infiltrate, Inflammatory Cell | Minimal | 4 | 0 | 0 | 2 | - | - | - | - |
| | Total | 4 | 0 | 0 | 2 | - | - | - | - |
| Salivary Gland, Mandibular | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Seminal Vesicles | No. examined | 10 | 0 | 0 | 10 | - | - | - | - |
| Skeletal muscle, Rectus femoris | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Skin and Subcutis | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Scab(s) | Slight | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spinal Cord Cervical | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Spinal Cord Lumbar | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |

TABLE 14 (cont) Histopathology - group distribution of findings - terminal sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Number of animals affected | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group/Sex | 1M | 2M | 3M | 4M | 1F | 2F | 3F | 4F |
| Tissue/Organ and Findings | No. of animals | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Spinal Cord Thoracic | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Spleen | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Stomach | No. examined | 10 | 1 | 0 | 10 | 10 | 0 | 0 | 10 |
| Testes | No. examined | 10 | 0 | 1 | 10 | - | - | - | - |
| Inflammation | Slight | 0 | 0 | 1 | 0 | - | - | - | - |
| | Total | 0 | 0 | 1 | 0 | - | - | - | - |
| Degeneration/Atrophy, Tubular | Moderate | 0 | 0 | 1 | 0 | - | - | - | - |
| | Total | 0 | 0 | 1 | 0 | - | - | - | - |
| Thymus | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Thyroids | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 1 | 10 |
| Dilatation, Follicular | Minimal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

TABLE 14 (cont) Histopathology - group distribution of findings - terminal sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Number of animals affected | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group/Sex | 1M | 2M | 3M | 4M | 1F | 2F | 3F | 4F |
| Tissue/Organ and Findings | No. of animals | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Trachea | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Tracheal Bifurcation | No. examined | 7 | 0 | 0 | 9 | 9 | 0 | 0 | 8 |
| Loss of Cilia/Epithelial Thinning, Point of Bifurcation | Minimal | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 3 |
| | Total | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 3 |
| Urinary Bladder | No. examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Uterus and Cervix | No. examined | - | - | - | - | 10 | 0 | 0 | 10 |
| Vagina | No. examined | - | - | - | - | 10 | 0 | 0 | 10 |

TABLE 14 (cont) Histopathology - group distribution of findings - recovery sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Number of animals affected | | | |
|---|---|---|---|---|---|
| | Group/Sex | 1M | 4M | 1F | 4F |
| Tissue/Organ and Findings | No. of animals | 10 | 10 | 10 | 10 |
| Kidneys | No. examined | 0 | 1 | 1 | 0 |
| Nephropathy, Chronic Progressive | Minimal | 0 | 1 | 0 | 0 |
| | Total | 0 | 1 | 0 | 0 |
| Accumulation, Hyaline Droplets | Minimal | 0 | 1 | 0 | 0 |
| | Total | 0 | 1 | 0 | 0 |
| Pyelonephritis | Slight | 0 | 0 | 1 | 0 |
| | Total | 0 | 0 | 1 | 0 |
| Lungs and Bronchi | No. examined | 1 | 0 | 0 | 0 |
| Adhesions | Minimal | 1 | 0 | 0 | 0 |
| | Total | 1 | 0 | 0 | 0 |
| Lymph Node, Axillary | No. examined | 0 | 0 | 0 | 1 |
| Erythrocytosis/Erythrophagocytosis, Sinuses | Minimal | 0 | 0 | 0 | 1 |
| | Total | 0 | 0 | 0 | 1 |

TABLE 14 (cont) Histopathology - group distribution of findings - recovery sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Number of animals affected | | | |
|---|---|---|---|---|---|
| | Group/Sex | 1M | 4M | 1F | 4F |
| Tissue/Organ and Findings | No. of animals | 10 | 10 | 10 | 10 |
| Thyroids | No. examined | 0 | 2 | 0 | 0 |

APPENDIX 1 Animal termination history - individual death statuses

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Type of Death | Phase | Phase Day[a] |
|---|---|---|---|---|
| 1M | 1001 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 1002 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 1003 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 1004 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 1005 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 1006 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 1007 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 1008 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 1009 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 1010 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 1011 | Recovery Euthanasia 1 | Recovery | R30 |
| | 1012 | Recovery Euthanasia 1 | Recovery | R30 |
| | 1013 | Recovery Euthanasia 1 | Recovery | R30 |
| | 1014 | Recovery Euthanasia 1 | Recovery | R30 |
| | 1015 | Recovery Euthanasia 1 | Recovery | R30 |
| | 1016 | Recovery Euthanasia 1 | Recovery | R30 |
| | 1017 | Recovery Euthanasia 1 | Recovery | R30 |
| | 1018 | Recovery Euthanasia 1 | Recovery | R30 |
| | 1019 | Recovery Euthanasia 1 | Recovery | R30 |
| | 1020 | Recovery Euthanasia 1 | Recovery | R30 |

a - The first day of each phase is defined as Day 1. The first day of test article administration is defined as Treatment Day 1.

APPENDIX 1 (cont) Animal termination history - individual death statuses

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Type of Death | Phase | Phase Day[a] |
|---|---|---|---|---|
| 2M | 2001 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 2002 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 2003 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 2004 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 2005 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 2006 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 2007 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 2008 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 2009 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 2010 | Scheduled Euthanasia 1 | Treatment | 92 |
| 3M | 3001 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 3002 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 3003 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 3004 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 3005 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 3006 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 3007 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 3008 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 3009 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 3010 | Scheduled Euthanasia 1 | Treatment | 92 |

a - The first day of each phase is defined as Day 1. The first day of test article administration is defined as Treatment Day 1.

APPENDIX 1 (cont) Animal termination history - individual death statuses

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Type of Death | Phase | Phase Day[a] |
|---|---|---|---|---|
| 4M | 4001 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 4002 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 4003 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 4004 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 4005 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 4006 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 4007 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 4008 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 4009 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 4010 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 4011 | Recovery Euthanasia 1 | Recovery | R30 |
| | 4012 | Recovery Euthanasia 1 | Recovery | R30 |
| | 4013 | Recovery Euthanasia 1 | Recovery | R30 |
| | 4014 | Recovery Euthanasia 1 | Recovery | R30 |
| | 4015 | Recovery Euthanasia 1 | Recovery | R30 |
| | 4016 | Recovery Euthanasia 1 | Recovery | R30 |
| | 4017 | Recovery Euthanasia 1 | Recovery | R30 |
| | 4018 | Recovery Euthanasia 1 | Recovery | R30 |
| | 4019 | Recovery Euthanasia 1 | Recovery | R30 |
| | 4020 | Recovery Euthanasia 1 | Recovery | R30 |

a - The first day of each phase is defined as Day 1. The first day of test article administration is defined as Treatment Day 1.

APPENDIX 1 (cont) Animal termination history - individual death statuses

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Type of Death | Phase | Phase Day[a] |
|---|---|---|---|---|
| 1F | 1501 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 1502 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 1503 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 1504 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 1505 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 1506 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 1507 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 1508 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 1509 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 1510 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 1511 | Recovery Euthanasia 1 | Recovery | R29 |
| | 1512 | Recovery Euthanasia 1 | Recovery | R29 |
| | 1513 | Recovery Euthanasia 1 | Recovery | R29 |
| | 1514 | Recovery Euthanasia 1 | Recovery | R29 |
| | 1515 | Recovery Euthanasia 1 | Recovery | R29 |
| | 1516 | Recovery Euthanasia 1 | Recovery | R29 |
| | 1517 | Recovery Euthanasia 1 | Recovery | R29 |
| | 1518 | Recovery Euthanasia 1 | Recovery | R29 |
| | 1519 | Recovery Euthanasia 1 | Recovery | R29 |
| | 1520 | Recovery Euthanasia 1 | Recovery | R29 |

a - The first day of each phase is defined as Day 1. The first day of test article administration is defined as Treatment Day 1.

APPENDIX 1 (cont) Animal termination history - individual death statuses

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Type of Death | Phase | Phase Day[a] |
|---|---|---|---|---|
| 2F | 2501 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 2502 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 2503 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 2504 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 2505 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 2506 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 2507 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 2508 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 2509 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 2510 | Scheduled Euthanasia 1 | Treatment | 92 |
| 3F | 3501 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 3502 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 3503 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 3504 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 3505 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 3506 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 3507 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 3508 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 3509 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 3510 | Scheduled Euthanasia 1 | Treatment | 92 |

a - The first day of each phase is defined as Day 1. The first day of test article administration is defined as Treatment Day 1.

APPENDIX 1 (cont) Animal termination history - individual death statuses

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Type of Death | Phase | Phase Day[a] |
|---|---|---|---|---|
| 4F | 4501 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 4502 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 4503 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 4504 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 4505 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 4506 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 4507 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 4508 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 4509 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 4510 | Scheduled Euthanasia 1 | Treatment | 92 |
| | 4511 | Recovery Euthanasia 1 | Recovery | R29 |
| | 4512 | Recovery Euthanasia 1 | Recovery | R29 |
| | 4513 | Recovery Euthanasia 1 | Recovery | R29 |
| | 4514 | Recovery Euthanasia 1 | Recovery | R29 |
| | 4515 | Recovery Euthanasia 1 | Recovery | R29 |
| | 4516 | Recovery Euthanasia 1 | Recovery | R29 |
| | 4517 | Recovery Euthanasia 1 | Recovery | R29 |
| | 4518 | Recovery Euthanasia 1 | Recovery | R29 |
| | 4519 | Recovery Euthanasia 1 | Recovery | R29 |
| | 4520 | Recovery Euthanasia 1 | Recovery | R29 |

a - The first day of each phase is defined as Day 1. The first day of test article administration is defined as Treatment Day 1.

APPENDIX 2 Daily observations - individual observations

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day of Death | Category | Observation | Day(s) observed AM | Day(s) observed PM |
|---|---|---|---|---|---|---|
| 1M | 1001S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 1002S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 1003S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 1004S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 1005S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 1006S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 1007S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 1008S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |

S1 - Scheduled Euthanasia 1

APPENDIX 2 (cont) Daily observations - individual observations

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day of Death | Category | Observation | Day(s) observed AM | Day(s) observed PM |
|---|---|---|---|---|---|---|
| 1M | 1009S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 1010S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 1011Z1 | R30 | Normal | Within normal limits | Ra2-Ra22, 2-91, R1-R30 | Ra1-Ra22, 1-12, 14-91, R1-R29 |
| | 1012Z1 | R30 | Normal | Within normal limits | Ra2-Ra22, 2-91, R1-R30 | Ra1-Ra22, 1-12, 14-91, R1-R29 |
| | 1013Z1 | R30 | Normal | Within normal limits | Ra2-Ra22, 2-91, R1-R30 | Ra1-Ra22, 1-12, 14-91, R1-R29 |
| | 1014Z1 | R30 | Normal | Within normal limits | Ra2-Ra22, 2-91, R1-R30 | Ra1-Ra22, 1-12, 14-91, R1-R29 |
| | 1015Z1 | R30 | Normal | Within normal limits | Ra2-Ra22, 2-91, R1-R30 | Ra1-Ra22, 1-12, 14-91, R1-R29 |
| | 1016Z1 | R30 | Normal | Within normal limits | Ra2-Ra22, 2-91, R1-R30 | Ra1-Ra22, 1-12, 14-91, R1-R29 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 2 (cont) Daily observations - individual observations

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day of Death | Category | Observation | Day(s) observed AM | Day(s) observed PM |
|---|---|---|---|---|---|---|
| 1M | 1017Z1 | R30 | Normal | Within normal limits | Ra2-Ra22, 2-91, R1-R30 | Ra1-Ra22, 1-12, 14-91, R1-R29 |
| | 1018Z1 | R30 | Normal | Within normal limits | Ra2-Ra22, 2-91, R1-R30 | Ra1-Ra22, 1-12, 14-91, R1-R29 |
| | 1019Z1 | R30 | Normal | Within normal limits | Ra2-Ra22, 2-91, R1-R30 | Ra1-Ra22, 1-12, 14-91, R1-R29 |
| | 1020Z1 | R30 | Normal | Within normal limits | Ra2-Ra22, 2-91, R1-R30 | Ra1-Ra22, 1-12, 14-91, R1-R29 |
| 2M | 2001S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 2002S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 2003S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 2004S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 2 (cont) Daily observations - individual observations

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day of Death | Category | Observation | Day(s) observed AM | Day(s) observed PM |
|---|---|---|---|---|---|---|
| 2M | 2005S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 2006S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 2007S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 2008S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 2009S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 2010S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| 3M | 3001S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 3002S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |

S1 - Scheduled Euthanasia 1

APPENDIX 2 (cont) Daily observations - individual observations

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day of Death | Category | Observation | Day(s) observed AM | Day(s) observed PM |
|---|---|---|---|---|---|---|
| 3M | 3003S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 3004S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 3005S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 3006S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 3007S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 3008S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 3009S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 3010S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |

S1 - Scheduled Euthanasia 1

APPENDIX 2 (cont) Daily observations - individual observations

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day of Death | Category | Observation | Day(s) observed AM | Day(s) observed PM |
|---|---|---|---|---|---|---|
| 4M | 4001S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 4002S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 4003S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 4004S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 4005S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 4006S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 4007S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 4008S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |

S1 - Scheduled Euthanasia 1

APPENDIX 2 (cont) Daily observations - individual observations

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day of Death | Category | Observation | Day(s) observed AM | Day(s) observed PM |
|---|---|---|---|---|---|---|
| 4M | 4009S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 4010S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 2-92 | Ra1-Ra22, 1-12, 14-91 |
| | 4011Z1 | R30 | Normal | Within normal limits | Ra2-Ra22, 2-91, R1-R30 | Ra1-Ra22, 1-12, 14-91, R1-R29 |
| | 4012Z1 | R30 | Normal | Within normal limits | Ra2-Ra22, 2-91, R1-R30 | Ra1-Ra22, 1-12, 14-91, R1-R29 |
| | 4013Z1 | R30 | Normal | Within normal limits | Ra2-Ra22, 2-91, R1-R30 | Ra1-Ra22, 1-12, 14-91, R1-R29 |
| | 4014Z1 | R30 | Normal | Within normal limits | Ra2-Ra22, 2-91, R1-R30 | Ra1-Ra22, 1-12, 14-91, R1-R29 |
| | 4015Z1 | R30 | Normal | Within normal limits | Ra2-Ra22, 2-91, R1-R30 | Ra1-Ra22, 1-12, 14-91, R1-R29 |
| | 4016Z1 | R30 | Normal | Within normal limits | Ra2-Ra22, 2-91, R1-R30 | Ra1-Ra22, 1-12, 14-91, R1-R29 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 2 (cont) Daily observations - individual observations

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day of Death | Category | Observation | Day(s) observed AM | Day(s) observed PM |
|---|---|---|---|---|---|---|
| 4M | 4017Z1 | R30 | Normal | Within normal limits | Ra2-Ra22, 2-91, R1-R30 | Ra1-Ra22, 1-12, 14-91, R1-R29 |
| | 4018Z1 | R30 | Normal | Within normal limits | Ra2-Ra22, 2-92, R1-R30 | Ra1-Ra22, 1-12, 14-91, R1-R29 |
| | 4019Z1 | R30 | Normal | Within normal limits | Ra2-Ra22, 2-91, R1-R30 | Ra1-Ra22, 1-12, 14-91, R1-R29 |
| | 4020Z1 | R30 | Normal | Within normal limits | Ra2-Ra22, 2-91, R1-R30 | Ra1-Ra22, 1-12, 14-91, R1-R29 |

Z1 - Recovery Euthanasia 1

APPENDIX 2 (cont) Daily observations - individual observations

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day of Death | Category | Observation | Day(s) observed AM | Day(s) observed PM |
|---|---|---|---|---|---|---|
| 1F | 1501S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 1502S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 1503S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 1504S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 1505S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 1506S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 1507S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 1508S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |

S1 - Scheduled Euthanasia 1

APPENDIX 2 (cont) Daily observations - individual observations

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day of Death | Category | Observation | Day(s) observed AM | Day(s) observed PM |
|---|---|---|---|---|---|---|
| 1F | 1509S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 1510S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 1511Z1 | R29 | Normal | Within normal limits | Ra2-Ra22, 1-91, R1-R29 | Ra1-Ra22, 1-11, 13-91, R1-R28 |
| | 1512Z1 | R29 | Normal | Within normal limits | Ra2-Ra22, 1-91, R1-R29 | Ra1-Ra22, 1-11, 13-91, R1-R28 |
| | 1513Z1 | R29 | Normal | Within normal limits | Ra2-Ra22, 1-91, R1-R29 | Ra1-Ra22, 1-11, 13-91, R1-R28 |
| | 1514Z1 | R29 | Normal | Within normal limits | Ra2-Ra22, 1-91, R1-R29 | Ra1-Ra22, 1-11, 13-91, R1-R28 |
| | 1515Z1 | R29 | Normal | Within normal limits | Ra2-Ra22, 1-91, R1-R29 | Ra1-Ra22, 1-11, 13-91, R1-R28 |
| | 1516Z1 | R29 | Normal | Within normal limits | Ra2-Ra22, 1-91, R1-R29 | Ra1-Ra22, 1-11, 13-91, R1-R28 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 2 (cont) Daily observations - individual observations

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day of Death | Category | Observation | Day(s) observed AM | Day(s) observed PM |
|---|---|---|---|---|---|---|
| 1F | 1517Z1 | R29 | Normal | Within normal limits | Ra2-Ra22, 1-91, R1-R29 | Ra1-Ra22, 1-11, 13-91, R1-R28 |
| | 1518Z1 | R29 | Normal | Within normal limits | Ra2-Ra22, 1-91, R1-R29 | Ra1-Ra22, 1-11, 13-91, R1-R28 |
| | 1519Z1 | R29 | Normal | Within normal limits | Ra2-Ra22, 1-91, R1-R29 | Ra1-Ra22, 1-11, 13-91, R1-R28 |
| | 1520Z1 | R29 | Normal | Within normal limits | Ra2-Ra22, 1-91, R1-R29 | Ra1-Ra22, 1-11, 13-91, R1-R28 |
| 2F | 2501S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 2502S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 2503S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 2504S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 2 (cont) Daily observations - individual observations

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day of Death | Category | Observation | Day(s) observed AM | Day(s) observed PM |
|---|---|---|---|---|---|---|
| 2F | 2505S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 2506S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 2507S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 2508S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 2509S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 2510S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| 3F | 3501S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 3502S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |

S1 - Scheduled Euthanasia 1

APPENDIX 2 (cont) Daily observations - individual observations

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day of Death | Category | Observation | Day(s) observed AM | Day(s) observed PM |
|---|---|---|---|---|---|---|
| 3F | 3503S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 3504S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 3505S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 3506S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 3507S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 3508S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 3509S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 3510S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |

S1 - Scheduled Euthanasia 1

APPENDIX 2 (cont) Daily observations - individual observations

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day of Death | Category | Observation | Day(s) observed AM | Day(s) observed PM |
|---|---|---|---|---|---|---|
| 4F | 4501S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 4502S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 4503S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 4504S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 4505S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 4506S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 4507S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 4508S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |

S1 - Scheduled Euthanasia 1

APPENDIX 2 (cont) Daily observations - individual observations

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day of Death | Category | Observation | Day(s) observed AM | Day(s) observed PM |
|---|---|---|---|---|---|---|
| 4F | 4509S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 4510S1 | 92 | Normal | Within normal limits | Ra2-Ra22, 1-92 | Ra1-Ra22, 1-11, 13-91 |
| | 4511Z1 | R29 | Normal | Within normal limits | Ra2-Ra22, 1-91, R1-R29 | Ra1-Ra22, 1-11, 13-91, R1-R28 |
| | 4512Z1 | R29 | Normal | Within normal limits | Ra2-Ra22, 1-91, R1-R29 | Ra1-Ra22, 1-11, 13-91, R1-R28 |
| | 4513Z1 | R29 | Normal | Within normal limits | Ra2-Ra22, 1-91, R1-R29 | Ra1-Ra22, 1-11, 13-91, R1-R28 |
| | 4514Z1 | R29 | Normal | Within normal limits | Ra2-Ra22, 1-91, R1-R29 | Ra1-Ra22, 1-11, 13-91, R1-R28 |
| | 4515Z1 | R29 | Normal | Within normal limits | Ra2-Ra22, 1-91, R1-R29 | Ra1-Ra22, 1-11, 13-91, R1-R28 |
| | 4516Z1 | R29 | Normal | Within normal limits | Ra2-Ra22, 1-91, R1-R29 | Ra1-Ra22, 1-11, 13-91, R1-R28 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 2 (cont) Daily observations - individual observations

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day of Death | Category | Observation | Day(s) observed AM | Day(s) observed PM |
|---|---|---|---|---|---|---|
| 4F | 4517Z1 | R29 | Normal | Within normal limits | Ra2-Ra22, 1-91, R1-R29 | Ra1-Ra22, 1-11, 13-91, R1-R28 |
| | 4518Z1 | R29 | Normal | Within normal limits | Ra2-Ra22, 1-91, R1-R29 | Ra1-Ra22, 1-11, 13-91, R1-R28 |
| | 4519Z1 | R29 | Normal | Within normal limits | Ra2-Ra22, 1-91, R1-R29 | Ra1-Ra22, 1-11, 13-91, R1-R28 |
| | 4520Z1 | R29 | Normal | Within normal limits | Ra2-Ra22, 1-91, R1-R29 | Ra1-Ra22, 1-11, 13-91, R1-R28 |

Z1 - Recovery Euthanasia 1

APPENDIX 3 Signs - individual observations

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week of Death | Phase | Category | Observation | Week(s) observed |
|---|---|---|---|---|---|---|
| 1M | 1001S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 1002S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 1003S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 1004S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 1005S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-7 |
| | | | | Coat | Hair loss, Dorsal surface | 9-13 |
| | | | | | Hair loss, Ventral surface | 8 |
| | 1006S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-9 |
| | | | | Coat | Hair loss, Forelimbs | 10-13 |

S1 - Scheduled Euthanasia 1

APPENDIX 3 (cont) Signs - individual observations

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week of Death | Phase | Category | Observation | Week(s) observed |
|---|---|---|---|---|---|---|
| 1M | 1007S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-4 |
| | | | | Coat | Hair loss, Head | 5-13 |
| | | | | Skin | Encrustation, Head | 5-9 |
| | 1008S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 1009S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 1010S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-6 |
| | | | | Coat | Hair loss, Head | 7-13 |
| | | | | Skin | Encrustation, Head | 7-13 |
| | 1011Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 1012Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 3 (cont) Signs - individual observations

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week of Death | Phase | Category | Observation | Week(s) observed |
|---|---|---|---|---|---|---|
| 1M | 1013Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 1014Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 1015Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 1016Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 1017Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 1018Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |

Z1 - Recovery Euthanasia 1

APPENDIX 3 (cont) Signs - individual observations

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week of Death | Phase | Category | Observation | Week(s) observed |
|---|---|---|---|---|---|---|
| 1M | 1019Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-7 |
| | | | | Coat | Hair loss, Head | 8-13 |
| | | | | Skin | Encrustation, Head | 9 |
| | | | Recovery | Normal | Within normal limits | R4 |
| | | | | Coat | Hair loss, Head | R1-R3 |
| | | | | Skin | Encrustation, Head | R2-R3 |
| | 1020Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| 2M | 2001S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 2002S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 2003S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 2004S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 3 (cont) Signs - individual observations

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week of Death | Phase | Category | Observation | Week(s) observed |
|---|---|---|---|---|---|---|
| 2M | 2005S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 2006S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 2007S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 2008S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-9 |
| | | | | Coat | Hair loss, Forelimbs | 10-13 |
| | 2009S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 2010S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| 3M | 3001S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 3002S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |

S1 - Scheduled Euthanasia 1

APPENDIX 3 (cont) Signs - individual observations

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week of Death | Phase | Category | Observation | Week(s) observed |
|---|---|---|---|---|---|---|
| 3M | 3002S1 | 14 | Treatment | Normal | Within normal limits | 1-13 |
| | 3003S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 3004S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 3005S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 3006S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 3007S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 3008S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 3009S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |

S1 - Scheduled Euthanasia 1

APPENDIX 3 (cont) Signs - individual observations

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week of Death | Phase | Category | Observation | Week(s) observed |
|---|---|---|---|---|---|---|
| 3M | 3010S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| 4M | 4001S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 4002S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 4003S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 4004S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 4005S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 4006S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 4007S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |

S1 - Scheduled Euthanasia 1

APPENDIX 3 (cont) Signs - individual observations

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week of Death | Phase | Category | Observation | Week(s) observed |
|---|---|---|---|---|---|---|
| 4M | 4008S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 4009S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 4010S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-8, 10-13 |
| | | | | Skin | Encrustation, Upper ventral surface | 9 |
| | 4011Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 4012Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 4013Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 3 (cont) Signs - individual observations

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week of Death | Phase | Category | Observation | Week(s) observed |
|---|---|---|---|---|---|---|
| 4M | 4014Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 4015Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 4016Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 4017Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 4018Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 4019Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |

Z1 - Recovery Euthanasia 1

APPENDIX 3 (cont) Signs - individual observations

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week of Death | Phase | Category | Observation | Week(s) observed |
|---|---|---|---|---|---|---|
| 4M | 4020Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |

Z1 - Recovery Euthanasia 1

APPENDIX 3 (cont) Signs - individual observations

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week of Death | Phase | Category | Observation | Week(s) observed |
|---|---|---|---|---|---|---|
| 1F | 1501S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 1502S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 1503S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 1504S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 1505S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 1506S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 1507S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 1508S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |

S1 - Scheduled Euthanasia 1

APPENDIX 3 (cont) Signs - individual observations

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week of Death | Phase | Category | Observation | Week(s) observed |
|---|---|---|---|---|---|---|
| 1F | 1509S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 1510S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 1511Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 1512Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 1513Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 1514Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 1515Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 3 (cont) Signs - individual observations

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week of Death | Phase | Category | Observation | Week(s) observed |
|---|---|---|---|---|---|---|
| 1F | 1515Z1 | R5 | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 1516Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-11 |
| | | | | Coat | Hair loss, Dorsal surface | 12-13 |
| | | | | Skin | Encrustation, Tail | 12-13 |
| | | | Recovery | Skin | Encrustation, Tail | R1-R4 |
| | 1517Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Coat | Hair loss, Forelimbs | R1-R4 |
| | 1518Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Coat | Hair loss, Forelimbs | R1-R4 |
| | 1519Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 1520Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |

Z1 - Recovery Euthanasia 1

APPENDIX 3 (cont) Signs - individual observations

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week of Death | Phase | Category | Observation | Week(s) observed |
|---|---|---|---|---|---|---|
| 1F | 1520Z1 | R5 | Recovery | Normal | Within normal limits | R1-R4 |
| 2F | 2501S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 2502S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-5 |
| | | | | Coat | Hair loss, Forelimbs | 6-13 |
| | 2503S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 2504S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 2505S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 2506S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 2507S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 3 (cont) Signs - individual observations

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week of Death | Phase | Category | Observation | Week(s) observed |
|---|---|---|---|---|---|---|
| 2F | 2508S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 2509S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 2510S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| 3F | 3501S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 3502S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-8 |
| | | | | Coat | Hair loss, Head | 9-13 |
| | 3503S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 3504S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-8, 12-13 |
| | | | | Coat | Hair loss, Dorsal surface | 9-11 |

S1 - Scheduled Euthanasia 1

APPENDIX 3 (cont) Signs - individual observations

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week of Death | Phase | Category | Observation | Week(s) observed |
|---|---|---|---|---|---|---|
| 3F | 3505S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 3506S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 3507S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 3508S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 3509S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-11 |
| | | | | Coat | Hair loss, Forelimbs | 12-13 |
| | 3510S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| 4F | 4501S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |

S1 - Scheduled Euthanasia 1

APPENDIX 3 (cont) Signs - individual observations

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week of Death | Phase | Category | Observation | Week(s) observed |
|---|---|---|---|---|---|---|
| 4F | 4502S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-11 |
| | | | | Superficial mass | Firm, Perigenital | 12-13 |
| | 4503S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 4504S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-11 |
| | | | | Coat | Hair loss, Dorsal surface | 12-13 |
| | 4505S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 4506S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 4507S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 4508S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |

S1 - Scheduled Euthanasia 1

APPENDIX 3 (cont) Signs - individual observations

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week of Death | Phase | Category | Observation | Week(s) observed |
|---|---|---|---|---|---|---|
| 4F | 4509S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 4510S1 | 14 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | 4511Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 4512Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 4513Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 4514Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 3 (cont) Signs - individual observations

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week of Death | Phase | Category | Observation | Week(s) observed |
|---|---|---|---|---|---|---|
| 4F | 4515Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-12 |
| | | | | Staining | Chromodacryorrhea | 13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 4516Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 4517Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 4518Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 4519Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |
| | | | Recovery | Normal | Within normal limits | R1-R4 |
| | 4520Z1 | R5 | Randomization | Normal | Within normal limits | Ra3 |
| | | | Treatment | Normal | Within normal limits | 1-13 |

Z1 - Recovery Euthanasia 1

APPENDIX 3 (cont) Signs - individual observations

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week of Death | Phase | Category | Observation | Week(s) observed |
|---|---|---|---|---|---|---|
| 4F | 4520Z1 | R5 | Recovery | Normal | Within normal limits | R1-R4 |

Z1 - Recovery Euthanasia 1

APENDIX 4 Exposure observations - individual observations

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group | Day of Death | Observation | Day(s) observed |
|---|---|---|---|
| 1M | | Within normal limits | 1-68 |
| 2M | | Within normal limits | 1-68 |
| 3M | | Within normal limits | 1-68 |
| 4M | | Within normal limits | 1-68 |
| 1F | | Within normal limits | 1-68 |
| 2F | | Within normal limits | 1-68 |
| 3F | | Within normal limits | 1-68 |
| 4F | | Within normal limits | 1-68 |

APPENDIX 5 Body weight - individual values (g)

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week Ra3 | Week 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | 1001S1 | 149 | 200 | 244 | 282 | 317 | 337 | 363 | 393 | 414 | 431 | 445 | 461 |
| | 1002S1 | 162 | 222 | 280 | 337 | 379 | 407 | 436 | 468 | 478 | 501 | 511 | 546 |
| | 1003S1 | 135 | 188 | 238 | 278 | 321 | 346 | 374 | 394 | 412 | 425 | 439 | 458 |
| | 1004S1 | 146 | 199 | 249 | 281 | 323 | 352 | 362 | 381 | 393 | 400 | 410 | 424 |
| | 1005S1 | 192 | 254 | 307 | 358 | 398 | 429 | 471 | 497 | 520 | 541 | 559 | 580 |
| | 1006S1 | 160 | 216 | 256 | 302 | 333 | 359 | 389 | 406 | 419 | 439 | 462 | 471 |
| | 1007S1 | 160 | 220 | 264 | 313 | 346 | 369 | 401 | 419 | 427 | 444 | 453 | 468 |
| | 1008S1 | 148 | 205 | 249 | 296 | 323 | 350 | 378 | 386 | 406 | 410 | 429 | 439 |
| | 1009S1 | 132 | 193 | 249 | 298 | 339 | 368 | 397 | 424 | 447 | 460 | 478 | 486 |
| | 1010S1 | 136 | 188 | 238 | 278 | 314 | 341 | 370 | 392 | 410 | 424 | 437 | 452 |
| | 1011Z1 | 134 | 180 | 228 | 267 | 300 | 322 | 352 | 370 | 391 | 406 | 425 | 429 |
| | 1012Z1 | 178 | 237 | 296 | 352 | 382 | 427 | 461 | 482 | 501 | 526 | 546 | 563 |
| | 1013Z1 | 151 | 206 | 250 | 299 | 336 | 368 | 402 | 416 | 432 | 452 | 466 | 484 |
| | 1014Z1 | 168 | 218 | 260 | 296 | 330 | 361 | 387 | 403 | 423 | 448 | 467 | 473 |
| | 1015Z1 | 136 | 185 | 230 | 258 | 300 | 329 | 355 | 379 | 395 | 410 | 420 | 426 |
| | 1016Z1 | 140 | 184 | 231 | 263 | 306 | 343 | 367 | 393 | 406 | 430 | 441 | 456 |
| | 1017Z1 | 152 | 196 | 237 | 277 | 311 | 339 | 358 | 377 | 395 | 418 | 423 | 435 |
| | 1018Z1 | 181 | 239 | 294 | 336 | 371 | 403 | 436 | 457 | 465 | 476 | 481 | 502 |
| | 1019Z1 | 147 | 210 | 264 | 314 | 359 | 391 | 422 | 431 | 454 | 477 | 497 | 515 |
| | 1020Z1 | 149 | 210 | 265 | 308 | 359 | 387 | 420 | 442 | 465 | 480 | 497 | 511 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 5 (cont) Body weight - individual values (g)

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week 12 | 13 | Week R1 | R2 | R3 | R4 | Change Ra3-1 | Change Ra3-2 | Change Ra3-3 | Change Ra3-4 | Change Ra3-5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | 1001S1 | 475 | 479 | | | | | 51 | 95 | 133 | 168 | 188 |
| | 1002S1 | 555 | 562 | | | | | 60 | 118 | 175 | 217 | 245 |
| | 1003S1 | 460 | 466 | | | | | 53 | 103 | 143 | 186 | 211 |
| | 1004S1 | 429 | 431 | | | | | 53 | 104 | 136 | 177 | 206 |
| | 1005S1 | 593 | 605 | | | | | 62 | 115 | 167 | 206 | 238 |
| | 1006S1 | 491 | 498 | | | | | 56 | 96 | 142 | 173 | 199 |
| | 1007S1 | 473 | 490 | | | | | 60 | 104 | 153 | 186 | 209 |
| | 1008S1 | 449 | 443 | | | | | 57 | 102 | 148 | 175 | 202 |
| | 1009S1 | 506 | 514 | | | | | 61 | 116 | 166 | 206 | 236 |
| | 1010S1 | 458 | 460 | | | | | 52 | 102 | 142 | 178 | 205 |
| | 1011Z1 | 433 | 442 | 459 | 462 | 470 | 487 | 46 | 95 | 134 | 167 | 188 |
| | 1012Z1 | 574 | 575 | 588 | 592 | 599 | 610 | 59 | 119 | 175 | 205 | 249 |
| | 1013Z1 | 496 | 501 | 523 | 527 | 535 | 546 | 55 | 99 | 148 | 186 | 217 |
| | 1014Z1 | 470 | 490 | 505 | 514 | 522 | 539 | 50 | 93 | 128 | 163 | 193 |
| | 1015Z1 | 425 | 425 | 446 | 452 | 462 | 470 | 48 | 94 | 122 | 164 | 192 |
| | 1016Z1 | 467 | 475 | 489 | 492 | 498 | 511 | 43 | 90 | 123 | 165 | 202 |
| | 1017Z1 | 441 | 453 | 474 | 476 | 481 | 496 | 44 | 84 | 125 | 158 | 187 |
| | 1018Z1 | 512 | 523 | 534 | 541 | 553 | 565 | 57 | 113 | 155 | 190 | 222 |
| | 1019Z1 | 530 | 535 | 555 | 564 | 580 | 595 | 63 | 116 | 166 | 212 | 244 |
| | 1020Z1 | 516 | 527 | 549 | 559 | 573 | 586 | 60 | 115 | 159 | 210 | 238 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 5 (cont) Body weight - individual values (g)

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Change Ra3-6 | Change Ra3-7 | Change Ra3-8 | Change Ra3-9 | Change Ra3-10 | Change Ra3-11 | Change Ra3-12 | Change Ra3-13 | Change Ra3-R1 | Change Ra3-R2 | Change Ra3-R3 | Change Ra3-R4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | 1001S1 | 214 | 244 | 265 | 282 | 296 | 312 | 326 | 330 | | | | |
| | 1002S1 | 274 | 306 | 316 | 339 | 349 | 384 | 393 | 401 | | | | |
| | 1003S1 | 239 | 259 | 277 | 290 | 304 | 323 | 325 | 331 | | | | |
| | 1004S1 | 216 | 236 | 247 | 254 | 264 | 278 | 283 | 285 | | | | |
| | 1005S1 | 280 | 305 | 328 | 349 | 367 | 388 | 402 | 414 | | | | |
| | 1006S1 | 228 | 246 | 259 | 279 | 302 | 311 | 331 | 337 | | | | |
| | 1007S1 | 241 | 259 | 267 | 284 | 293 | 308 | 313 | 330 | | | | |
| | 1008S1 | 230 | 238 | 258 | 263 | 281 | 292 | 301 | 295 | | | | |
| | 1009S1 | 264 | 291 | 315 | 328 | 346 | 354 | 373 | 382 | | | | |
| | 1010S1 | 234 | 256 | 274 | 288 | 301 | 316 | 322 | 324 | | | | |
| | 1011Z1 | 218 | 236 | 257 | 272 | 292 | 295 | 300 | 309 | 325 | 328 | 336 | 353 |
| | 1012Z1 | 284 | 305 | 324 | 349 | 369 | 386 | 397 | 398 | 410 | 414 | 422 | 432 |
| | 1013Z1 | 251 | 265 | 281 | 301 | 315 | 333 | 345 | 350 | 372 | 376 | 384 | 395 |
| | 1014Z1 | 219 | 235 | 255 | 280 | 299 | 306 | 302 | 322 | 338 | 347 | 354 | 371 |
| | 1015Z1 | 219 | 243 | 259 | 274 | 284 | 289 | 288 | 289 | 310 | 315 | 326 | 334 |
| | 1016Z1 | 226 | 252 | 266 | 289 | 301 | 315 | 326 | 334 | 348 | 352 | 357 | 370 |
| | 1017Z1 | 205 | 224 | 243 | 266 | 271 | 283 | 288 | 301 | 322 | 323 | 329 | 344 |
| | 1018Z1 | 255 | 275 | 284 | 295 | 299 | 321 | 331 | 342 | 353 | 360 | 372 | 384 |
| | 1019Z1 | 275 | 284 | 307 | 330 | 350 | 367 | 382 | 388 | 408 | 416 | 432 | 448 |
| | 1020Z1 | 271 | 293 | 316 | 330 | 348 | 361 | 366 | 378 | 399 | 410 | 423 | 436 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 5 (cont) Body weight - individual values (g)

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week Ra3 | Week 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2M | 2001S1 | 155 | 216 | 269 | 313 | 357 | 376 | 402 | 432 | 432 | 451 | 462 | 479 |
| | 2002S1 | 158 | 225 | 277 | 329 | 369 | 384 | 419 | 446 | 457 | 480 | 494 | 513 |
| | 2003S1 | 157 | 218 | 257 | 291 | 318 | 343 | 366 | 394 | 394 | 410 | 419 | 438 |
| | 2004S1 | 163 | 217 | 266 | 297 | 324 | 337 | 370 | 382 | 397 | 405 | 423 | 427 |
| | 2005S1 | 170 | 243 | 300 | 357 | 402 | 422 | 466 | 483 | 501 | 529 | 535 | 547 |
| | 2006S1 | 158 | 220 | 272 | 325 | 360 | 376 | 416 | 433 | 454 | 476 | 494 | 513 |
| | 2007S1 | 157 | 220 | 274 | 312 | 353 | 378 | 417 | 437 | 461 | 486 | 503 | 514 |
| | 2008S1 | 139 | 186 | 234 | 277 | 309 | 329 | 364 | 383 | 395 | 415 | 434 | 449 |
| | 2009S1 | 150 | 208 | 258 | 298 | 330 | 353 | 379 | 396 | 405 | 432 | 442 | 453 |
| | 2010S1 | 149 | 206 | 253 | 293 | 327 | 342 | 373 | 390 | 410 | 448 | 438 | 452 |
| 3M | 3001S1 | 144 | 189 | 234 | 265 | 302 | 331 | 361 | 389 | 403 | 426 | 446 | 457 |
| | 3002S1 | 164 | 216 | 258 | 291 | 315 | 332 | 347 | 368 | 381 | 391 | 406 | 419 |
| | 3003S1 | 156 | 215 | 257 | 294 | 326 | 344 | 365 | 394 | 404 | 419 | 429 | 445 |
| | 3004S1 | 155 | 214 | 266 | 309 | 352 | 380 | 411 | 439 | 451 | 476 | 491 | 503 |
| | 3005S1 | 155 | 207 | 261 | 304 | 340 | 374 | 405 | 436 | 453 | 474 | 483 | 504 |
| | 3006S1 | 163 | 229 | 291 | 349 | 401 | 436 | 465 | 502 | 527 | 543 | 571 | 588 |
| | 3007S1 | 178 | 247 | 313 | 362 | 409 | 443 | 483 | 510 | 536 | 550 | 562 | 576 |
| | 3008S1 | 162 | 220 | 271 | 313 | 347 | 370 | 392 | 414 | 433 | 452 | 470 | 480 |
| | 3009S1 | 175 | 235 | 284 | 328 | 355 | 380 | 411 | 435 | 449 | 469 | 471 | 492 |
| | 3010S1 | 157 | 214 | 261 | 306 | 343 | 363 | 402 | 425 | 440 | 459 | 470 | 487 |

S1 - Scheduled Euthanasia 1

APPENDIX 5 (cont) Body weight - individual values (g)

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week 12 | 13 | Week R1 | R2 | R3 | R4 | Change Ra3-1 | Change Ra3-2 | Change Ra3-3 | Change Ra3-4 | Change Ra3-5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2M | 2001S1 | 489 | 493 | | | | | 61 | 114 | 158 | 202 | 220 |
| | 2002S1 | 527 | 526 | | | | | 67 | 120 | 172 | 211 | 226 |
| | 2003S1 | 446 | 446 | | | | | 62 | 100 | 134 | 162 | 186 |
| | 2004S1 | 425 | 425 | | | | | 55 | 103 | 134 | 162 | 175 |
| | 2005S1 | 563 | 568 | | | | | 72 | 130 | 187 | 231 | 251 |
| | 2006S1 | 535 | 535 | | | | | 62 | 114 | 167 | 202 | 218 |
| | 2007S1 | 520 | 528 | | | | | 63 | 117 | 155 | 196 | 221 |
| | 2008S1 | 460 | 460 | | | | | 48 | 95 | 139 | 170 | 191 |
| | 2009S1 | 456 | 455 | | | | | 58 | 108 | 148 | 180 | 203 |
| | 2010S1 | 466 | 472 | | | | | 58 | 104 | 144 | 179 | 193 |
| 3M | 3001S1 | 470 | 477 | | | | | 45 | 90 | 121 | 158 | 187 |
| | 3002S1 | 429 | 432 | | | | | 52 | 94 | 127 | 151 | 168 |
| | 3003S1 | 458 | 464 | | | | | 59 | 101 | 138 | 170 | 188 |
| | 3004S1 | 516 | 521 | | | | | 59 | 111 | 154 | 197 | 225 |
| | 3005S1 | 515 | 519 | | | | | 51 | 106 | 149 | 185 | 219 |
| | 3006S1 | 598 | 611 | | | | | 66 | 128 | 186 | 238 | 273 |
| | 3007S1 | 590 | 604 | | | | | 69 | 135 | 184 | 231 | 265 |
| | 3008S1 | 484 | 495 | | | | | 57 | 108 | 150 | 184 | 208 |
| | 3009S1 | 504 | 511 | | | | | 60 | 109 | 153 | 180 | 205 |
| | 3010S1 | 501 | 501 | | | | | 57 | 105 | 149 | 186 | 206 |

S1 - Scheduled Euthanasia 1

APPENDIX 5 (cont) Body weight - individual values (g)

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Change Ra3-6 | Change Ra3-7 | Change Ra3-8 | Change Ra3-9 | Change Ra3-10 | Change Ra3-11 | Change Ra3-12 | Change Ra3-13 | Change Ra3-R1 | Change Ra3-R2 | Change Ra3-R3 | Change Ra3-R4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2M | 2001S1 | 247 | 277 | 277 | 295 | 307 | 324 | 334 | 337 | | | | |
| | 2002S1 | 262 | 289 | 300 | 322 | 336 | 355 | 370 | 368 | | | | |
| | 2003S1 | 209 | 238 | 237 | 253 | 262 | 281 | 289 | 289 | | | | |
| | 2004S1 | 208 | 220 | 235 | 243 | 261 | 264 | 263 | 263 | | | | |
| | 2005S1 | 296 | 313 | 331 | 359 | 365 | 377 | 393 | 397 | | | | |
| | 2006S1 | 257 | 275 | 295 | 318 | 336 | 355 | 377 | 377 | | | | |
| | 2007S1 | 260 | 280 | 304 | 329 | 347 | 357 | 363 | 371 | | | | |
| | 2008S1 | 225 | 244 | 257 | 276 | 296 | 310 | 321 | 322 | | | | |
| | 2009S1 | 229 | 246 | 255 | 282 | 292 | 303 | 306 | 305 | | | | |
| | 2010S1 | 224 | 241 | 261 | 299 | 289 | 303 | 317 | 323 | | | | |
| 3M | 3001S1 | 217 | 245 | 259 | 282 | 302 | 313 | 326 | 333 | | | | |
| | 3002S1 | 183 | 204 | 217 | 227 | 242 | 255 | 264 | 267 | | | | |
| | 3003S1 | 209 | 238 | 248 | 263 | 273 | 289 | 302 | 308 | | | | |
| | 3004S1 | 256 | 284 | 296 | 321 | 336 | 349 | 361 | 366 | | | | |
| | 3005S1 | 249 | 281 | 298 | 319 | 328 | 349 | 360 | 364 | | | | |
| | 3006S1 | 302 | 339 | 364 | 380 | 408 | 425 | 435 | 448 | | | | |
| | 3007S1 | 305 | 332 | 357 | 372 | 384 | 398 | 412 | 426 | | | | |
| | 3008S1 | 229 | 252 | 271 | 290 | 307 | 318 | 322 | 332 | | | | |
| | 3009S1 | 236 | 260 | 274 | 294 | 296 | 317 | 329 | 336 | | | | |
| | 3010S1 | 245 | 268 | 283 | 302 | 314 | 330 | 344 | 344 | | | | |

S1 - Scheduled Euthanasia 1

APPENDIX 5 (cont) Body weight - individual values (g)

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week Ra3 | Week 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4M | 4001S1 | 151 | 206 | 254 | 296 | 333 | 354 | 375 | 396 | 405 | 418 | 437 | 447 |
| | 4002S1 | 137 | 184 | 236 | 282 | 321 | 348 | 381 | 403 | 434 | 454 | 483 | 493 |
| | 4003S1 | 163 | 224 | 281 | 337 | 376 | 403 | 437 | 467 | 475 | 501 | 527 | 539 |
| | 4004S1 | 163 | 215 | 267 | 310 | 342 | 361 | 381 | 397 | 406 | 427 | 434 | 443 |
| | 4005S1 | 160 | 213 | 263 | 299 | 337 | 360 | 386 | 404 | 420 | 441 | 451 | 464 |
| | 4006S1 | 170 | 231 | 285 | 326 | 370 | 409 | 431 | 459 | 477 | 507 | 528 | 543 |
| | 4007S1 | 173 | 237 | 295 | 342 | 387 | 415 | 441 | 467 | 469 | 501 | 516 | 526 |
| | 4008S1 | 131 | 183 | 217 | 261 | 281 | 300 | 323 | 341 | 350 | 373 | 379 | 390 |
| | 4009S1 | 172 | 233 | 284 | 326 | 368 | 398 | 426 | 442 | 452 | 468 | 481 | 498 |
| | 4010S1 | 142 | 192 | 235 | 268 | 302 | 329 | 356 | 378 | 379 | 399 | 409 | 417 |
| | 4011Z1 | 151 | 210 | 264 | 309 | 345 | 380 | 406 | 424 | 443 | 468 | 478 | 500 |
| | 4012Z1 | 147 | 200 | 251 | 283 | 317 | 350 | 375 | 389 | 401 | 408 | 423 | 428 |
| | 4013Z1 | 135 | 178 | 210 | 242 | 268 | 293 | 306 | 319 | 325 | 335 | 348 | 361 |
| | 4014Z1 | 122 | 165 | 214 | 261 | 301 | 336 | 364 | 384 | 396 | 416 | 438 | 442 |
| | 4015Z1 | 155 | 205 | 248 | 281 | 310 | 338 | 350 | 370 | 376 | 391 | 398 | 410 |
| | 4016Z1 | 139 | 187 | 227 | 270 | 300 | 334 | 350 | 366 | 374 | 400 | 406 | 414 |
| | 4017Z1 | 159 | 215 | 258 | 293 | 327 | 359 | 377 | 395 | 408 | 433 | 442 | 462 |
| | 4018Z1 | 147 | 210 | 253 | 294 | 332 | 370 | 397 | 411 | 418 | 444 | 448 | 475 |
| | 4019Z1 | 145 | 201 | 248 | 281 | 313 | 346 | 374 | 392 | 401 | 419 | 430 | 452 |
| | 4020Z1 | 149 | 201 | 251 | 295 | 329 | 357 | 392 | 409 | 427 | 454 | 452 | 469 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 5 (cont) Body weight - individual values (g)

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week 12 | 13 | Week R1 | R2 | R3 | R4 | Change Ra3-1 | Change Ra3-2 | Change Ra3-3 | Change Ra3-4 | Change Ra3-5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4M | 4001S1 | 456 | 455 | | | | | 55 | 103 | 144 | 182 | 203 |
| | 4002S1 | 496 | 503 | | | | | 48 | 99 | 145 | 185 | 212 |
| | 4003S1 | 549 | 552 | | | | | 60 | 118 | 174 | 213 | 240 |
| | 4004S1 | 455 | 454 | | | | | 52 | 104 | 147 | 180 | 198 |
| | 4005S1 | 481 | 488 | | | | | 53 | 104 | 139 | 177 | 200 |
| | 4006S1 | 560 | 559 | | | | | 61 | 115 | 156 | 200 | 239 |
| | 4007S1 | 534 | 542 | | | | | 65 | 122 | 170 | 214 | 242 |
| | 4008S1 | 401 | 405 | | | | | 52 | 86 | 130 | 150 | 168 |
| | 4009S1 | 507 | 515 | | | | | 62 | 113 | 155 | 197 | 226 |
| | 4010S1 | 438 | 446 | | | | | 49 | 93 | 126 | 159 | 186 |
| | 4011Z1 | 516 | 516 | 539 | 555 | 571 | 595 | 59 | 113 | 157 | 194 | 229 |
| | 4012Z1 | 435 | 440 | 454 | 463 | 478 | 485 | 53 | 104 | 136 | 170 | 203 |
| | 4013Z1 | 361 | 367 | 376 | 384 | 394 | 405 | 43 | 75 | 107 | 133 | 158 |
| | 4014Z1 | 457 | 466 | 478 | 489 | 496 | 512 | 43 | 92 | 139 | 179 | 214 |
| | 4015Z1 | 419 | 420 | 430 | 436 | 444 | 457 | 51 | 93 | 127 | 155 | 184 |
| | 4016Z1 | 425 | 428 | 439 | 447 | 458 | 469 | 48 | 88 | 131 | 161 | 195 |
| | 4017Z1 | 465 | 471 | 497 | 510 | 529 | 543 | 57 | 99 | 135 | 168 | 200 |
| | 4018Z1 | 493 | 502 | 529 | 538 | 555 | 573 | 63 | 106 | 147 | 185 | 222 |
| | 4019Z1 | 462 | 470 | 488 | 498 | 509 | 533 | 56 | 103 | 135 | 168 | 201 |
| | 4020Z1 | 486 | 495 | 509 | 520 | 531 | 546 | 52 | 102 | 146 | 179 | 208 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 5 (cont) Body weight - individual values (g)

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Change Ra3-6 | Change Ra3-7 | Change Ra3-8 | Change Ra3-9 | Change Ra3-10 | Change Ra3-11 | Change Ra3-12 | Change Ra3-13 | Change Ra3-R1 | Change Ra3-R2 | Change Ra3-R3 | Change Ra3-R4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4M | 4001S1 | 224 | 245 | 254 | 267 | 286 | 296 | 305 | 304 | | | | |
| | 4002S1 | 245 | 266 | 298 | 317 | 347 | 357 | 359 | 366 | | | | |
| | 4003S1 | 273 | 304 | 312 | 338 | 363 | 376 | 385 | 389 | | | | |
| | 4004S1 | 218 | 234 | 243 | 264 | 272 | 280 | 292 | 291 | | | | |
| | 4005S1 | 226 | 244 | 260 | 281 | 292 | 304 | 322 | 328 | | | | |
| | 4006S1 | 260 | 289 | 307 | 336 | 357 | 372 | 390 | 389 | | | | |
| | 4007S1 | 268 | 294 | 296 | 329 | 344 | 353 | 362 | 369 | | | | |
| | 4008S1 | 192 | 210 | 219 | 242 | 248 | 258 | 270 | 274 | | | | |
| | 4009S1 | 255 | 271 | 280 | 297 | 309 | 326 | 336 | 344 | | | | |
| | 4010S1 | 214 | 236 | 237 | 256 | 266 | 275 | 296 | 304 | | | | |
| | 4011Z1 | 254 | 273 | 292 | 317 | 327 | 349 | 364 | 365 | 387 | 404 | 419 | 444 |
| | 4012Z1 | 228 | 242 | 253 | 261 | 275 | 281 | 288 | 293 | 307 | 316 | 330 | 338 |
| | 4013Z1 | 171 | 184 | 190 | 200 | 213 | 226 | 226 | 232 | 241 | 249 | 259 | 270 |
| | 4014Z1 | 242 | 262 | 274 | 294 | 316 | 320 | 336 | 344 | 356 | 367 | 375 | 390 |
| | 4015Z1 | 195 | 216 | 221 | 237 | 243 | 255 | 265 | 266 | 275 | 281 | 290 | 302 |
| | 4016Z1 | 211 | 226 | 235 | 261 | 267 | 275 | 285 | 288 | 300 | 308 | 319 | 330 |
| | 4017Z1 | 219 | 236 | 250 | 274 | 284 | 304 | 307 | 312 | 339 | 351 | 370 | 384 |
| | 4018Z1 | 250 | 264 | 271 | 297 | 301 | 327 | 346 | 355 | 381 | 391 | 408 | 426 |
| | 4019Z1 | 228 | 247 | 256 | 274 | 284 | 306 | 317 | 324 | 343 | 353 | 363 | 388 |
| | 4020Z1 | 243 | 260 | 278 | 305 | 303 | 320 | 337 | 346 | 360 | 371 | 382 | 397 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 5 (cont) Body weight - individual values (g)

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week Ra3 | Week 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | 1501S1 | 149 | 178 | 208 | 229 | 248 | 254 | 264 | 269 | 285 | 291 | 291 | 306 |
| | 1502S1 | 132 | 166 | 198 | 217 | 231 | 238 | 259 | 262 | 278 | 273 | 283 | 291 |
| | 1503S1 | 133 | 169 | 202 | 225 | 237 | 247 | 259 | 267 | 274 | 280 | 285 | 292 |
| | 1504S1 | 127 | 176 | 185 | 195 | 209 | 219 | 229 | 228 | 240 | 245 | 244 | 250 |
| | 1505S1 | 140 | 166 | 197 | 212 | 234 | 244 | 253 | 253 | 276 | 274 | 273 | 287 |
| | 1506S1 | 138 | 171 | 201 | 216 | 229 | 243 | 259 | 259 | 268 | 277 | 277 | 282 |
| | 1507S1 | 129 | 155 | 183 | 194 | 217 | 224 | 235 | 238 | 255 | 251 | 256 | 267 |
| | 1508S1 | 130 | 154 | 186 | 206 | 223 | 229 | 240 | 259 | 275 | 271 | 272 | 286 |
| | 1509S1 | 145 | 176 | 195 | 218 | 233 | 240 | 247 | 259 | 269 | 274 | 271 | 287 |
| | 1510S1 | 136 | 161 | 186 | 203 | 212 | 224 | 242 | 249 | 253 | 266 | 275 | 281 |
| | 1511Z1 | 148 | 182 | 205 | 223 | 233 | 253 | 263 | 273 | 281 | 278 | 282 | 294 |
| | 1512Z1 | 137 | 164 | 188 | 202 | 223 | 230 | 245 | 245 | 255 | 268 | 270 | 272 |
| | 1513Z1 | 143 | 167 | 198 | 213 | 225 | 238 | 253 | 251 | 267 | 272 | 268 | 284 |
| | 1514Z1 | 153 | 179 | 221 | 247 | 265 | 272 | 283 | 301 | 316 | 315 | 315 | 338 |
| | 1515Z1 | 135 | 172 | 202 | 218 | 230 | 239 | 252 | 258 | 280 | 279 | 273 | 289 |
| | 1516Z1 | 136 | 168 | 197 | 215 | 230 | 241 | 255 | 261 | 272 | 274 | 276 | 292 |
| | 1517Z1 | 145 | 183 | 212 | 233 | 256 | 271 | 283 | 292 | 305 | 312 | 308 | 318 |
| | 1518Z1 | 129 | 154 | 180 | 197 | 213 | 227 | 231 | 242 | 250 | 250 | 257 | 267 |
| | 1519Z1 | 146 | 169 | 194 | 207 | 226 | 233 | 245 | 253 | 263 | 260 | 263 | 282 |
| | 1520Z1 | 147 | 167 | 197 | 210 | 230 | 241 | 261 | 261 | 268 | 283 | 288 | 301 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 5 (cont) Body weight - individual values (g)

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week 12 | 13 | Week R1 | R2 | R3 | R4 | Change Ra3-1 | Change Ra3-2 | Change Ra3-3 | Change Ra3-4 | Change Ra3-5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | 1501S1 | 314 | 314 | | | | | 30 | 60 | 80 | 100 | 105 |
| | 1502S1 | 298 | 302 | | | | | 34 | 67 | 86 | 100 | 106 |
| | 1503S1 | 287 | 289 | | | | | 36 | 69 | 92 | 103 | 114 |
| | 1504S1 | 258 | 259 | | | | | 49 | 58 | 68 | 82 | 92 |
| | 1505S1 | 290 | 285 | | | | | 26 | 57 | 72 | 93 | 103 |
| | 1506S1 | 285 | 282 | | | | | 33 | 62 | 78 | 91 | 105 |
| | 1507S1 | 266 | 269 | | | | | 27 | 54 | 66 | 89 | 96 |
| | 1508S1 | 292 | 291 | | | | | 25 | 56 | 76 | 93 | 100 |
| | 1509S1 | 293 | 296 | | | | | 30 | 50 | 73 | 88 | 94 |
| | 1510S1 | 279 | 290 | | | | | 26 | 50 | 67 | 76 | 88 |
| | 1511Z1 | 292 | 294 | 310 | 315 | 310 | 319 | 34 | 57 | 75 | 85 | 104 |
| | 1512Z1 | 279 | 278 | 292 | 291 | 289 | 289 | 27 | 51 | 65 | 86 | 93 |
| | 1513Z1 | 285 | 290 | 295 | 298 | 301 | 302 | 24 | 55 | 70 | 82 | 95 |
| | 1514Z1 | 346 | 338 | 350 | 362 | 359 | 358 | 26 | 69 | 94 | 112 | 120 |
| | 1515Z1 | 294 | 307 | 300 | 314 | 311 | 325 | 37 | 67 | 83 | 95 | 104 |
| | 1516Z1 | 287 | 288 | 303 | 310 | 310 | 310 | 32 | 61 | 79 | 94 | 105 |
| | 1517Z1 | 324 | 331 | 338 | 349 | 347 | 349 | 38 | 67 | 88 | 111 | 126 |
| | 1518Z1 | 274 | 276 | 277 | 293 | 294 | 291 | 25 | 52 | 69 | 84 | 98 |
| | 1519Z1 | 276 | 276 | 289 | 299 | 293 | 300 | 22 | 48 | 60 | 80 | 87 |
| | 1520Z1 | 306 | 313 | 325 | 337 | 334 | 344 | 21 | 50 | 63 | 84 | 94 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 5 (cont) Body weight - individual values (g)

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Change Ra3-6 | Change Ra3-7 | Change Ra3-8 | Change Ra3-9 | Change Ra3-10 | Change Ra3-11 | Change Ra3-12 | Change Ra3-13 | Change Ra3-R1 | Change Ra3-R2 | Change Ra3-R3 | Change Ra3-R4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | 1501S1 | 116 | 121 | 136 | 142 | 142 | 157 | 165 | 166 | | | | |
| | 1502S1 | 127 | 130 | 146 | 141 | 152 | 159 | 167 | 170 | | | | |
| | 1503S1 | 126 | 133 | 141 | 147 | 152 | 159 | 154 | 156 | | | | |
| | 1504S1 | 102 | 101 | 113 | 118 | 117 | 123 | 131 | 132 | | | | |
| | 1505S1 | 113 | 113 | 136 | 134 | 132 | 146 | 150 | 145 | | | | |
| | 1506S1 | 120 | 121 | 130 | 139 | 139 | 144 | 147 | 143 | | | | |
| | 1507S1 | 107 | 109 | 126 | 122 | 127 | 139 | 138 | 140 | | | | |
| | 1508S1 | 110 | 129 | 145 | 141 | 142 | 157 | 163 | 162 | | | | |
| | 1509S1 | 102 | 114 | 124 | 129 | 126 | 142 | 148 | 150 | | | | |
| | 1510S1 | 107 | 113 | 117 | 131 | 139 | 145 | 143 | 154 | | | | |
| | 1511Z1 | 114 | 124 | 132 | 130 | 134 | 146 | 144 | 146 | 161 | 167 | 162 | 171 |
| | 1512Z1 | 108 | 108 | 119 | 132 | 133 | 135 | 142 | 141 | 155 | 154 | 152 | 152 |
| | 1513Z1 | 109 | 108 | 124 | 128 | 125 | 140 | 141 | 146 | 151 | 155 | 158 | 158 |
| | 1514Z1 | 130 | 148 | 163 | 162 | 162 | 185 | 193 | 186 | 198 | 209 | 207 | 206 |
| | 1515Z1 | 117 | 124 | 145 | 144 | 138 | 155 | 160 | 172 | 166 | 179 | 177 | 190 |
| | 1516Z1 | 119 | 125 | 136 | 138 | 140 | 156 | 151 | 152 | 167 | 175 | 174 | 174 |
| | 1517Z1 | 138 | 146 | 160 | 167 | 163 | 173 | 179 | 186 | 193 | 204 | 202 | 204 |
| | 1518Z1 | 102 | 113 | 121 | 121 | 128 | 139 | 145 | 148 | 148 | 165 | 165 | 162 |
| | 1519Z1 | 99 | 107 | 117 | 114 | 116 | 136 | 129 | 130 | 143 | 153 | 147 | 154 |
| | 1520Z1 | 114 | 114 | 121 | 136 | 141 | 155 | 159 | 166 | 178 | 190 | 187 | 197 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 5 (cont) Body weight - individual values (g)

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week Ra3 | Week 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2F | 2501S1 | 132 | 167 | 189 | 216 | 228 | 235 | 244 | 255 | 264 | 270 | 267 | 281 |
| | 2502S1 | 147 | 174 | 205 | 221 | 239 | 242 | 251 | 261 | 275 | 278 | 276 | 285 |
| | 2503S1 | 139 | 171 | 197 | 212 | 228 | 230 | 243 | 256 | 264 | 269 | 273 | 284 |
| | 2504S1 | 133 | 156 | 181 | 204 | 222 | 220 | 237 | 251 | 263 | 261 | 262 | 277 |
| | 2505S1 | 126 | 163 | 188 | 211 | 229 | 233 | 245 | 252 | 268 | 268 | 265 | 278 |
| | 2506S1 | 150 | 183 | 212 | 225 | 240 | 251 | 268 | 275 | 285 | 291 | 293 | 304 |
| | 2507S1 | 127 | 165 | 191 | 206 | 227 | 235 | 253 | 262 | 264 | 275 | 274 | 284 |
| | 2508S1 | 141 | 172 | 198 | 204 | 225 | 241 | 250 | 254 | 265 | 266 | 269 | 279 |
| | 2509S1 | 155 | 179 | 202 | 220 | 239 | 246 | 256 | 265 | 281 | 279 | 284 | 293 |
| | 2510S1 | 141 | 168 | 192 | 213 | 230 | 231 | 243 | 254 | 262 | 261 | 267 | 279 |
| 3F | 3501S1 | 157 | 193 | 216 | 235 | 247 | 249 | 262 | 263 | 280 | 286 | 280 | 288 |
| | 3502S1 | 132 | 167 | 198 | 218 | 234 | 243 | 265 | 271 | 282 | 284 | 287 | 296 |
| | 3503S1 | 141 | 169 | 192 | 203 | 216 | 221 | 237 | 240 | 248 | 251 | 257 | 262 |
| | 3504S1 | 146 | 173 | 203 | 220 | 232 | 240 | 254 | 258 | 274 | 280 | 278 | 289 |
| | 3505S1 | 139 | 173 | 203 | 214 | 234 | 244 | 265 | 271 | 283 | 301 | 301 | 306 |
| | 3506S1 | 143 | 175 | 204 | 216 | 226 | 234 | 250 | 251 | 272 | 269 | 274 | 287 |
| | 3507S1 | 140 | 170 | 202 | 217 | 224 | 238 | 254 | 262 | 274 | 277 | 282 | 293 |
| | 3508S1 | 156 | 187 | 208 | 232 | 249 | 257 | 279 | 292 | 296 | 302 | 305 | 313 |
| | 3509S1 | 142 | 167 | 204 | 231 | 243 | 247 | 254 | 264 | 279 | 282 | 283 | 293 |
| | 3510S1 | 143 | 172 | 199 | 215 | 233 | 242 | 250 | 263 | 273 | 281 | 282 | 289 |

S1 - Scheduled Euthanasia 1

APPENDIX 5 (cont) Body weight - individual values (g)

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week 12 | 13 | Week R1 | R2 | R3 | R4 | Change Ra3-1 | Change Ra3-2 | Change Ra3-3 | Change Ra3-4 | Change Ra3-5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2F | 2501S1 | 286 | 287 | | | | | 35 | 57 | 85 | 96 | 104 |
| | 2502S1 | 291 | 286 | | | | | 28 | 58 | 74 | 93 | 96 |
| | 2503S1 | 283 | 278 | | | | | 32 | 58 | 73 | 89 | 91 |
| | 2504S1 | 282 | 280 | | | | | 23 | 48 | 71 | 89 | 87 |
| | 2505S1 | 278 | 278 | | | | | 37 | 62 | 85 | 103 | 107 |
| | 2506S1 | 301 | 307 | | | | | 33 | 63 | 76 | 91 | 102 |
| | 2507S1 | 282 | 287 | | | | | 38 | 64 | 80 | 101 | 108 |
| | 2508S1 | 290 | 289 | | | | | 31 | 57 | 63 | 84 | 100 |
| | 2509S1 | 300 | 298 | | | | | 25 | 47 | 66 | 85 | 91 |
| | 2510S1 | 279 | 270 | | | | | 28 | 51 | 72 | 89 | 90 |
| 3F | 3501S1 | 296 | 293 | | | | | 36 | 59 | 77 | 90 | 92 |
| | 3502S1 | 300 | 302 | | | | | 36 | 66 | 87 | 102 | 112 |
| | 3503S1 | 257 | 264 | | | | | 28 | 51 | 62 | 75 | 80 |
| | 3504S1 | 291 | 289 | | | | | 27 | 57 | 74 | 86 | 94 |
| | 3505S1 | 314 | 314 | | | | | 34 | 64 | 76 | 96 | 105 |
| | 3506S1 | 286 | 289 | | | | | 32 | 60 | 72 | 83 | 90 |
| | 3507S1 | 290 | 296 | | | | | 29 | 62 | 77 | 84 | 98 |
| | 3508S1 | 316 | 320 | | | | | 30 | 52 | 76 | 92 | 101 |
| | 3509S1 | 301 | 299 | | | | | 25 | 62 | 89 | 101 | 104 |
| | 3510S1 | 296 | 294 | | | | | 29 | 57 | 72 | 91 | 100 |

S1 - Scheduled Euthanasia 1

APPENDIX 5 (cont) Body weight - individual values (g)

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Change Ra3-6 | Change Ra3-7 | Change Ra3-8 | Change Ra3-9 | Change Ra3-10 | Change Ra3-11 | Change Ra3-12 | Change Ra3-13 | Change Ra3-R1 | Change Ra3-R2 | Change Ra3-R3 | Change Ra3-R4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2F | 2501S1 | 112 | 123 | 132 | 138 | 135 | 149 | 155 | 155 | | | | |
| | 2502S1 | 104 | 114 | 128 | 131 | 130 | 138 | 144 | 140 | | | | |
| | 2503S1 | 104 | 117 | 125 | 130 | 134 | 144 | 143 | 139 | | | | |
| | 2504S1 | 104 | 118 | 130 | 128 | 129 | 144 | 149 | 147 | | | | |
| | 2505S1 | 119 | 126 | 143 | 142 | 139 | 152 | 152 | 152 | | | | |
| | 2506S1 | 119 | 126 | 136 | 141 | 143 | 155 | 152 | 158 | | | | |
| | 2507S1 | 127 | 136 | 137 | 148 | 148 | 158 | 155 | 160 | | | | |
| | 2508S1 | 109 | 113 | 124 | 126 | 128 | 138 | 149 | 148 | | | | |
| | 2509S1 | 102 | 111 | 126 | 125 | 130 | 139 | 146 | 143 | | | | |
| | 2510S1 | 102 | 113 | 121 | 120 | 126 | 138 | 138 | 129 | | | | |
| 3F | 3501S1 | 105 | 106 | 123 | 129 | 123 | 131 | 139 | 136 | | | | |
| | 3502S1 | 133 | 139 | 150 | 153 | 156 | 165 | 168 | 171 | | | | |
| | 3503S1 | 96 | 100 | 107 | 110 | 116 | 121 | 116 | 123 | | | | |
| | 3504S1 | 109 | 112 | 128 | 134 | 132 | 143 | 145 | 143 | | | | |
| | 3505S1 | 126 | 132 | 144 | 162 | 162 | 167 | 175 | 175 | | | | |
| | 3506S1 | 107 | 108 | 128 | 126 | 131 | 144 | 142 | 146 | | | | |
| | 3507S1 | 114 | 122 | 133 | 137 | 142 | 153 | 150 | 155 | | | | |
| | 3508S1 | 123 | 135 | 139 | 145 | 148 | 157 | 160 | 164 | | | | |
| | 3509S1 | 112 | 122 | 136 | 139 | 141 | 151 | 159 | 157 | | | | |
| | 3510S1 | 107 | 121 | 131 | 138 | 139 | 146 | 153 | 152 | | | | |

S1 - Scheduled Euthanasia 1

APPENDIX 5 (cont) Body weight - individual values (g)

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week Ra3 | Week 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4F | 4501S1 | 123 | 152 | 180 | 191 | 203 | 209 | 226 | 231 | 239 | 242 | 249 | 252 |
| | 4502S1 | 145 | 175 | 208 | 213 | 235 | 251 | 264 | 268 | 276 | 279 | 288 | 291 |
| | 4503S1 | 146 | 174 | 202 | 213 | 233 | 237 | 255 | 262 | 266 | 269 | 277 | 287 |
| | 4504S1 | 127 | 151 | 179 | 187 | 204 | 210 | 218 | 225 | 233 | 242 | 241 | 249 |
| | 4505S1 | 135 | 164 | 186 | 187 | 208 | 216 | 231 | 229 | 235 | 247 | 249 | 247 |
| | 4506S1 | 161 | 189 | 207 | 232 | 246 | 252 | 261 | 276 | 281 | 289 | 293 | 301 |
| | 4507S1 | 126 | 149 | 175 | 182 | 200 | 212 | 228 | 232 | 242 | 251 | 255 | 262 |
| | 4508S1 | 140 | 173 | 199 | 216 | 236 | 241 | 249 | 264 | 271 | 271 | 279 | 281 |
| | 4509S1 | 150 | 181 | 203 | 215 | 230 | 240 | 257 | 261 | 271 | 275 | 282 | 287 |
| | 4510S1 | 145 | 178 | 208 | 228 | 247 | 262 | 277 | 291 | 294 | 299 | 305 | 311 |
| | 4511Z1 | 139 | 164 | 184 | 202 | 216 | 224 | 229 | 238 | 247 | 260 | 252 | 263 |
| | 4512Z1 | 150 | 187 | 208 | 232 | 256 | 271 | 275 | 286 | 294 | 303 | 307 | 319 |
| | 4513Z1 | 147 | 177 | 207 | 233 | 234 | 240 | 252 | 263 | 273 | 280 | 282 | 297 |
| | 4514Z1 | 124 | 147 | 171 | 187 | 202 | 219 | 226 | 236 | 243 | 250 | 255 | 261 |
| | 4515Z1 | 141 | 174 | 212 | 216 | 233 | 239 | 245 | 252 | 267 | 280 | 271 | 282 |
| | 4516Z1 | 140 | 169 | 201 | 215 | 224 | 241 | 253 | 261 | 269 | 275 | 284 | 295 |
| | 4517Z1 | 129 | 155 | 179 | 193 | 203 | 220 | 232 | 240 | 244 | 252 | 256 | 270 |
| | 4518Z1 | 123 | 156 | 182 | 198 | 212 | 226 | 243 | 249 | 256 | 263 | 267 | 280 |
| | 4519Z1 | 140 | 172 | 193 | 209 | 218 | 232 | 237 | 247 | 250 | 261 | 268 | 271 |
| | 4520Z1 | 151 | 176 | 200 | 221 | 230 | 244 | 254 | 264 | 266 | 269 | 275 | 294 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 5 (cont) Body weight - individual values (g)

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week 12 | 13 | Week R1 | R2 | R3 | R4 | Change Ra3-1 | Change Ra3-2 | Change Ra3-3 | Change Ra3-4 | Change Ra3-5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4F | 4501S1 | 257 | 259 | | | | | 30 | 58 | 69 | 81 | 87 |
| | 4502S1 | 295 | 295 | | | | | 30 | 63 | 68 | 90 | 106 |
| | 4503S1 | 288 | 292 | | | | | 28 | 56 | 67 | 87 | 91 |
| | 4504S1 | 245 | 250 | | | | | 24 | 52 | 60 | 77 | 82 |
| | 4505S1 | 252 | 253 | | | | | 30 | 52 | 53 | 73 | 81 |
| | 4506S1 | 303 | 304 | | | | | 28 | 46 | 71 | 85 | 91 |
| | 4507S1 | 269 | 269 | | | | | 24 | 49 | 56 | 75 | 86 |
| | 4508S1 | 291 | 294 | | | | | 33 | 59 | 76 | 96 | 101 |
| | 4509S1 | 292 | 292 | | | | | 31 | 53 | 65 | 80 | 90 |
| | 4510S1 | 316 | 314 | | | | | 34 | 63 | 83 | 103 | 117 |
| | 4511Z1 | 269 | 271 | 281 | 300 | 291 | 295 | 25 | 45 | 63 | 77 | 85 |
| | 4512Z1 | 325 | 324 | 338 | 357 | 357 | 359 | 37 | 59 | 83 | 107 | 122 |
| | 4513Z1 | 298 | 303 | 313 | 321 | 327 | 326 | 30 | 60 | 86 | 87 | 93 |
| | 4514Z1 | 266 | 274 | 282 | 293 | 300 | 299 | 24 | 47 | 63 | 78 | 95 |
| | 4515Z1 | 290 | 286 | 296 | 311 | 300 | 322 | 33 | 71 | 75 | 92 | 99 |
| | 4516Z1 | 293 | 296 | 314 | 319 | 309 | 313 | 29 | 61 | 75 | 84 | 101 |
| | 4517Z1 | 268 | 265 | 279 | 276 | 280 | 285 | 27 | 51 | 65 | 74 | 92 |
| | 4518Z1 | 276 | 284 | 292 | 292 | 290 | 297 | 32 | 58 | 75 | 88 | 103 |
| | 4519Z1 | 270 | 275 | 288 | 288 | 287 | 293 | 32 | 53 | 68 | 78 | 92 |
| | 4520Z1 | 283 | 290 | 310 | 315 | 314 | 323 | 26 | 49 | 70 | 79 | 93 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 5 (cont) Body weight - individual values (g)

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Change Ra3-6 | Change Ra3-7 | Change Ra3-8 | Change Ra3-9 | Change Ra3-10 | Change Ra3-11 | Change Ra3-12 | Change Ra3-13 | Change Ra3-R1 | Change Ra3-R2 | Change Ra3-R3 | Change Ra3-R4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4F | 4501S1 | 104 | 108 | 116 | 119 | 126 | 130 | 135 | 136 | | | | |
| | 4502S1 | 119 | 123 | 131 | 134 | 144 | 146 | 150 | 151 | | | | |
| | 4503S1 | 108 | 116 | 119 | 123 | 131 | 141 | 142 | 146 | | | | |
| | 4504S1 | 91 | 98 | 106 | 114 | 113 | 122 | 118 | 122 | | | | |
| | 4505S1 | 97 | 94 | 101 | 112 | 115 | 113 | 118 | 118 | | | | |
| | 4506S1 | 100 | 115 | 120 | 128 | 132 | 140 | 142 | 143 | | | | |
| | 4507S1 | 102 | 106 | 116 | 125 | 129 | 136 | 144 | 143 | | | | |
| | 4508S1 | 109 | 124 | 131 | 131 | 139 | 141 | 151 | 154 | | | | |
| | 4509S1 | 107 | 111 | 121 | 124 | 132 | 137 | 142 | 142 | | | | |
| | 4510S1 | 133 | 146 | 149 | 155 | 161 | 167 | 172 | 170 | | | | |
| | 4511Z1 | 90 | 99 | 108 | 122 | 113 | 124 | 130 | 132 | 142 | 161 | 153 | 156 |
| | 4512Z1 | 126 | 136 | 144 | 154 | 157 | 169 | 175 | 174 | 189 | 208 | 207 | 210 |
| | 4513Z1 | 105 | 116 | 126 | 133 | 135 | 150 | 151 | 156 | 165 | 174 | 180 | 178 |
| | 4514Z1 | 102 | 112 | 120 | 126 | 131 | 138 | 142 | 151 | 158 | 169 | 176 | 175 |
| | 4515Z1 | 104 | 111 | 126 | 140 | 130 | 141 | 150 | 145 | 155 | 171 | 159 | 181 |
| | 4516Z1 | 113 | 121 | 129 | 135 | 144 | 155 | 153 | 156 | 174 | 179 | 169 | 173 |
| | 4517Z1 | 103 | 111 | 116 | 124 | 127 | 141 | 139 | 136 | 150 | 148 | 151 | 156 |
| | 4518Z1 | 120 | 126 | 133 | 139 | 144 | 157 | 153 | 160 | 168 | 169 | 167 | 174 |
| | 4519Z1 | 97 | 107 | 110 | 121 | 127 | 131 | 130 | 135 | 148 | 148 | 146 | 153 |
| | 4520Z1 | 104 | 113 | 115 | 118 | 124 | 143 | 132 | 139 | 159 | 164 | 163 | 172 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 6 Body weight change - individual values (g)

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week Ra3-1 | Week 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | Week R1-R2 | R2-R3 | R3-R4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | 1001S1 | 51 | 30 | 21 | 17 | 14 | 16 | 14 | 4 | | | |
| | 1002S1 | 60 | 32 | 10 | 23 | 11 | 35 | 9 | 7 | | | |
| | 1003S1 | 53 | 20 | 18 | 13 | 15 | 19 | 2 | 7 | | | |
| | 1004S1 | 53 | 20 | 11 | 7 | 10 | 13 | 5 | 2 | | | |
| | 1005S1 | 62 | 25 | 23 | 21 | 18 | 21 | 14 | 12 | | | |
| | 1006S1 | 56 | 17 | 13 | 20 | 24 | 9 | 20 | 7 | | | |
| | 1007S1 | 60 | 18 | 8 | 17 | 9 | 15 | 5 | 17 | | | |
| | 1008S1 | 57 | 8 | 20 | 4 | 18 | 11 | 9 | -6 | | | |
| | 1009S1 | 61 | 27 | 23 | 13 | 18 | 8 | 20 | 9 | | | |
| | 1010S1 | 52 | 22 | 18 | 14 | 13 | 15 | 7 | 1 | | | |
| | 1011Z1 | 46 | 18 | 21 | 15 | 20 | 4 | 5 | 9 | 3 | 8 | 17 |
| | 1012Z1 | 59 | 21 | 19 | 25 | 20 | 17 | 11 | 1 | 4 | 8 | 10 |
| | 1013Z1 | 55 | 14 | 16 | 21 | 14 | 18 | 11 | 5 | 4 | 8 | 12 |
| | 1014Z1 | 50 | 17 | 20 | 25 | 20 | 6 | -3 | 20 | 9 | 7 | 17 |
| | 1015Z1 | 48 | 24 | 16 | 15 | 10 | 5 | -1 | 1 | 6 | 11 | 8 |
| | 1016Z1 | 43 | 26 | 14 | 23 | 11 | 15 | 11 | 8 | 3 | 6 | 13 |
| | 1017Z1 | 44 | 19 | 18 | 23 | 5 | 12 | 6 | 12 | 2 | 6 | 15 |
| | 1018Z1 | 57 | 21 | 8 | 12 | 4 | 22 | 9 | 11 | 7 | 12 | 12 |
| | 1019Z1 | 63 | 9 | 23 | 22 | 20 | 18 | 15 | 6 | 9 | 16 | 15 |
| | 1020Z1 | 60 | 22 | 23 | 15 | 17 | 14 | 5 | 11 | 11 | 13 | 13 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 6 (cont) Body weight change - individual values (g)

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week Ra3-1 | Week 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | Week R1-R2 | R2-R3 | R3-R4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2M | 2001S1 | 61 | 30 | 0 | 19 | 11 | 17 | 10 | 4 | | | |
| | 2002S1 | 67 | 27 | 11 | 23 | 14 | 19 | 15 | -2 | | | |
| | 2003S1 | 62 | 29 | -1 | 16 | 10 | 19 | 9 | -1 | | | |
| | 2004S1 | 55 | 12 | 15 | 8 | 18 | 4 | -2 | 0 | | | |
| | 2005S1 | 72 | 17 | 18 | 28 | 6 | 12 | 16 | 4 | | | |
| | 2006S1 | 62 | 18 | 21 | 22 | 18 | 19 | 22 | 0 | | | |
| | 2007S1 | 63 | 20 | 24 | 25 | 18 | 10 | 6 | 8 | | | |
| | 2008S1 | 48 | 19 | 13 | 20 | 19 | 14 | 11 | 0 | | | |
| | 2009S1 | 58 | 17 | 10 | 27 | 9 | 11 | 3 | -1 | | | |
| | 2010S1 | 58 | 17 | 20 | 38 | -10 | 14 | 15 | 6 | | | |
| 3M | 3001S1 | 45 | 29 | 14 | 23 | 21 | 11 | 13 | 7 | | | |
| | 3002S1 | 52 | 21 | 13 | 10 | 15 | 13 | 10 | 3 | | | |
| | 3003S1 | 59 | 29 | 10 | 15 | 10 | 16 | 13 | 6 | | | |
| | 3004S1 | 59 | 27 | 12 | 25 | 15 | 13 | 12 | 5 | | | |
| | 3005S1 | 51 | 32 | 17 | 21 | 9 | 22 | 10 | 4 | | | |
| | 3006S1 | 66 | 37 | 25 | 16 | 28 | 17 | 10 | 13 | | | |
| | 3007S1 | 69 | 27 | 26 | 15 | 12 | 14 | 14 | 14 | | | |
| | 3008S1 | 57 | 22 | 19 | 19 | 17 | 11 | 4 | 11 | | | |
| | 3009S1 | 60 | 24 | 15 | 20 | 2 | 21 | 12 | 7 | | | |
| | 3010S1 | 57 | 23 | 15 | 19 | 11 | 17 | 14 | 0 | | | |

S1 - Scheduled Euthanasia 1

APPENDIX 6 (cont) Body weight change - individual values (g)

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week Ra3-1 | Week 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | Week R1-R2 | R2-R3 | R3-R4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4M | 4001S1 | 55 | 21 | 9 | 13 | 19 | 10 | 9 | -1 | | | |
| | 4002S1 | 48 | 21 | 32 | 19 | 30 | 10 | 3 | 7 | | | |
| | 4003S1 | 60 | 30 | 8 | 26 | 26 | 13 | 9 | 4 | | | |
| | 4004S1 | 52 | 16 | 10 | 20 | 8 | 8 | 12 | -1 | | | |
| | 4005S1 | 53 | 18 | 16 | 21 | 10 | 12 | 18 | 7 | | | |
| | 4006S1 | 61 | 28 | 18 | 30 | 21 | 15 | 18 | -1 | | | |
| | 4007S1 | 65 | 26 | 3 | 32 | 15 | 10 | 9 | 7 | | | |
| | 4008S1 | 52 | 18 | 10 | 23 | 6 | 11 | 12 | 4 | | | |
| | 4009S1 | 62 | 16 | 9 | 17 | 13 | 17 | 9 | 8 | | | |
| | 4010S1 | 49 | 22 | 1 | 19 | 10 | 9 | 21 | 8 | | | |
| | 4011Z1 | 59 | 18 | 19 | 25 | 10 | 23 | 15 | 1 | 16 | 16 | 24 |
| | 4012Z1 | 53 | 14 | 12 | 8 | 14 | 6 | 7 | 5 | 9 | 15 | 7 |
| | 4013Z1 | 43 | 13 | 6 | 10 | 13 | 13 | 0 | 6 | 8 | 10 | 11 |
| | 4014Z1 | 43 | 20 | 12 | 21 | 22 | 4 | 16 | 8 | 11 | 8 | 16 |
| | 4015Z1 | 51 | 20 | 6 | 15 | 7 | 12 | 9 | 1 | 6 | 9 | 12 |
| | 4016Z1 | 48 | 16 | 8 | 26 | 6 | 8 | 10 | 3 | 8 | 11 | 11 |
| | 4017Z1 | 57 | 18 | 13 | 25 | 10 | 20 | 3 | 6 | 12 | 20 | 14 |
| | 4018Z1 | 63 | 14 | 7 | 26 | 4 | 27 | 19 | 9 | 10 | 16 | 18 |
| | 4019Z1 | 56 | 19 | 9 | 18 | 11 | 22 | 10 | 8 | 10 | 11 | 24 |
| | 4020Z1 | 52 | 17 | 18 | 27 | -2 | 17 | 17 | 9 | 11 | 12 | 15 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 6 (cont) Body weight change - individual values (g)

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week Ra3-1 | Week 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | Week R1-R2 | R2-R3 | R3-R4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | 1501S1 | 30 | 5 | 15 | 6 | -1 | 15 | 8 | 0 | | | |
| | 1502S1 | 34 | 3 | 16 | -5 | 10 | 8 | 7 | 4 | | | |
| | 1503S1 | 36 | 7 | 8 | 6 | 5 | 7 | -5 | 2 | | | |
| | 1504S1 | 49 | -1 | 12 | 6 | -1 | 6 | 8 | 1 | | | |
| | 1505S1 | 26 | 0 | 23 | -2 | -1 | 14 | 3 | -5 | | | |
| | 1506S1 | 33 | 0 | 9 | 9 | 0 | 5 | 3 | -4 | | | |
| | 1507S1 | 27 | 3 | 16 | -4 | 5 | 12 | -1 | 3 | | | |
| | 1508S1 | 25 | 19 | 16 | -4 | 1 | 15 | 6 | -1 | | | |
| | 1509S1 | 30 | 12 | 10 | 5 | -3 | 16 | 7 | 2 | | | |
| | 1510S1 | 26 | 7 | 4 | 13 | 9 | 6 | -2 | 11 | | | |
| | 1511Z1 | 34 | 10 | 8 | -2 | 3 | 12 | -2 | 2 | 5 | -5 | 9 |
| | 1512Z1 | 27 | 0 | 11 | 13 | 2 | 2 | 7 | -1 | -1 | -2 | 0 |
| | 1513Z1 | 24 | -1 | 16 | 5 | -4 | 15 | 1 | 5 | 3 | 4 | 0 |
| | 1514Z1 | 26 | 18 | 15 | -1 | -1 | 23 | 8 | -8 | 12 | -3 | -1 |
| | 1515Z1 | 37 | 7 | 21 | -1 | -7 | 17 | 5 | 13 | 13 | -2 | 14 |
| | 1516Z1 | 32 | 6 | 11 | 2 | 2 | 16 | -5 | 1 | 7 | -1 | 1 |
| | 1517Z1 | 38 | 9 | 13 | 7 | -5 | 10 | 6 | 7 | 11 | -2 | 2 |
| | 1518Z1 | 25 | 11 | 8 | 0 | 7 | 10 | 7 | 3 | 17 | 1 | -3 |
| | 1519Z1 | 22 | 8 | 10 | -3 | 2 | 19 | -6 | 0 | 11 | -6 | 7 |
| | 1520Z1 | 21 | 0 | 7 | 15 | 5 | 14 | 4 | 8 | 12 | -2 | 9 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 6 (cont) Body weight change - individual values (g)

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week Ra3-1 | Week 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | Week R1-R2 | R2-R3 | R3-R4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2F | 2501S1 | 35 | 11 | 9 | 6 | -3 | 14 | 5 | 1 | | | |
| | 2502S1 | 28 | 10 | 14 | 3 | -2 | 8 | 7 | -5 | | | |
| | 2503S1 | 32 | 12 | 9 | 5 | 4 | 11 | -1 | -4 | | | |
| | 2504S1 | 23 | 13 | 13 | -2 | 1 | 14 | 5 | -2 | | | |
| | 2505S1 | 37 | 7 | 16 | -1 | -3 | 13 | 0 | 0 | | | |
| | 2506S1 | 33 | 7 | 10 | 6 | 2 | 12 | -3 | 6 | | | |
| | 2507S1 | 38 | 9 | 2 | 11 | -1 | 10 | -2 | 5 | | | |
| | 2508S1 | 31 | 4 | 11 | 2 | 3 | 10 | 10 | -1 | | | |
| | 2509S1 | 25 | 9 | 16 | -2 | 5 | 9 | 7 | -3 | | | |
| | 2510S1 | 28 | 11 | 8 | -1 | 6 | 12 | 0 | -10 | | | |
| 3F | 3501S1 | 36 | 1 | 17 | 6 | -6 | 9 | 8 | -3 | | | |
| | 3502S1 | 36 | 6 | 11 | 2 | 3 | 9 | 4 | 2 | | | |
| | 3503S1 | 28 | 4 | 8 | 3 | 6 | 4 | -5 | 7 | | | |
| | 3504S1 | 27 | 3 | 16 | 7 | -2 | 11 | 2 | -1 | | | |
| | 3505S1 | 34 | 6 | 12 | 18 | 0 | 6 | 8 | 0 | | | |
| | 3506S1 | 32 | 1 | 21 | -3 | 5 | 13 | -1 | 4 | | | |
| | 3507S1 | 29 | 8 | 12 | 3 | 5 | 11 | -3 | 5 | | | |
| | 3508S1 | 30 | 13 | 4 | 6 | 3 | 9 | 3 | 4 | | | |
| | 3509S1 | 25 | 10 | 14 | 3 | 1 | 10 | 8 | -2 | | | |
| | 3510S1 | 29 | 13 | 10 | 8 | 1 | 7 | 7 | -2 | | | |

S1 - Scheduled Euthanasia 1

APPENDIX 6 (cont) Body weight change - individual values (g)

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Week Ra3-1 | Week 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | Week R1-R2 | R2-R3 | R3-R4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4F | 4501S1 | 30 | 5 | 8 | 3 | 7 | 4 | 5 | 2 | | | |
| | 4502S1 | 30 | 4 | 8 | 3 | 10 | 2 | 5 | 0 | | | |
| | 4503S1 | 28 | 7 | 4 | 4 | 8 | 10 | 1 | 4 | | | |
| | 4504S1 | 24 | 7 | 8 | 8 | -1 | 8 | -4 | 5 | | | |
| | 4505S1 | 30 | -3 | 7 | 11 | 2 | -2 | 5 | 0 | | | |
| | 4506S1 | 28 | 15 | 5 | 8 | 4 | 9 | 1 | 2 | | | |
| | 4507S1 | 24 | 4 | 10 | 9 | 4 | 7 | 8 | -1 | | | |
| | 4508S1 | 33 | 15 | 7 | 0 | 7 | 3 | 10 | 3 | | | |
| | 4509S1 | 31 | 4 | 10 | 4 | 7 | 6 | 5 | 0 | | | |
| | 4510S1 | 34 | 14 | 3 | 6 | 6 | 6 | 5 | -2 | | | |
| | 4511Z1 | 25 | 9 | 9 | 13 | -8 | 11 | 6 | 3 | 19 | -9 | 3 |
| | 4512Z1 | 37 | 11 | 8 | 10 | 4 | 12 | 6 | -1 | 19 | -1 | 3 |
| | 4513Z1 | 30 | 11 | 9 | 7 | 2 | 16 | 1 | 5 | 9 | 6 | -1 |
| | 4514Z1 | 24 | 10 | 8 | 7 | 5 | 7 | 4 | 9 | 11 | 7 | -1 |
| | 4515Z1 | 33 | 7 | 15 | 14 | -10 | 11 | 8 | -5 | 15 | -11 | 22 |
| | 4516Z1 | 29 | 8 | 8 | 6 | 9 | 11 | -3 | 4 | 5 | -10 | 4 |
| | 4517Z1 | 27 | 8 | 5 | 8 | 4 | 14 | -2 | -3 | -3 | 4 | 5 |
| | 4518Z1 | 32 | 6 | 8 | 6 | 5 | 13 | -4 | 7 | 1 | -2 | 7 |
| | 4519Z1 | 32 | 10 | 3 | 11 | 7 | 3 | 0 | 5 | 0 | -2 | 6 |
| | 4520Z1 | 26 | 10 | 2 | 4 | 5 | 20 | -12 | 8 | 5 | -1 | 9 |

S1 - Scheduled Euthanasia 1, Z1 - Recovery Euthanasia 1

APPENDIX 7 Food consumption - individual values (g/animal/day)

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Cage Number | Week Ra2 | Week 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | 001 | 23 | 25 | 27 | 27 | 25 | 30 | 27 | 27 | 29 | 28 | 27 | 29 |
| | 002 | 20 | 21 | 23 | 24 | 23 | 25 | 24 | 24 | 24 | 23 | 23 | 24 |
| | 003 | 25 | 25 | 25 | 26 | 26 | 31 | 27 | 27 | 27 | 27 | 28 | 28 |
| | 004 | 22 | 22 | 25 | 26 | 24 | 27 | 24 | 22 | 24 | 23 | 23 | 24 |
| | 005 | 21 | 23 | 24 | 26 | 23 | 27 | 25 | 26 | 27 | 24 | 25 | 26 |
| | 006 | 22 | 24 | 25 | 27 | 27 | 28 | 27 | 27 | 28 | 26 | 28 | 28 |
| | 007 | 22 | 21 | 22 | 24 | 25 | 25 | 24 | 25 | 26 | 25 | 25 | 25 |
| | 008 | 20 | 20 | 19 | 24 | 23 | 24 | 24 | 24 | 26 | 23 | 24 | 23 |
| | 009 | 22 | 22 | 23 | 25 | 25 | 26 | 24 | 25 | 26 | 23 | 23 | 26 |
| | 010 | 22 | 24 | 26 | 27 | 28 | 27 | 26 | 27 | 28 | 26 | 27 | 28 |
| 2M | 016 | 25 | 25 | 26 | 29 | 26 | 29 | 28 | 29 | 28 | 27 | 27 | 28 |
| | 017 | 24 | 23 | 23 | 24 | 21 | 26 | 24 | 24 | 24 | 22 | 23 | 25 |
| | 018 | 25 | 26 | 29 | 30 | 27 | 30 | 30 | 29 | 31 | 28 | 28 | 30 |
| | 019 | 22 | 24 | 25 | 25 | 24 | 29 | 27 | 27 | 28 | 27 | 27 | 28 |
| | 020 | 22 | 23 | 28 | 24 | 22 | 27 | 25 | 25 | 26 | 24 | 25 | 25 |
| 3M | 027 | 22 | 22 | 22 | 23 | 21 | 26 | 25 | 24 | 25 | 23 | 25 | 26 |
| | 028 | 22 | 23 | 24 | 25 | 24 | 26 | 25 | 26 | 26 | 25 | 25 | 26 |
| | 029 | 23 | 25 | 27 | 30 | 27 | 31 | 30 | 31 | 31 | 30 | 31 | 31 |
| | 030 | 26 | 26 | 27 | 29 | 25 | 31 | 30 | 29 | 31 | 30 | 28 | 30 |
| | 031 | 23 | 24 | 24 | 26 | 23 | 28 | 27 | 28 | 28 | 27 | 26 | 27 |

APPENDIX 7 (cont) Food consumption - individual values (g/animal/day)

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Cage Number | Week 12 | Week 13 | Week R1 | R2 | R3 | R4 |
|---|---|---|---|---|---|---|---|
| 1M | 001 | 27 | 26 | | | | |
| | 002 | 22 | 22 | | | | |
| | 003 | 27 | 26 | | | | |
| | 004 | 22 | 23 | | | | |
| | 005 | 26 | 26 | | | | |
| | 006 | 27 | 26 | 24 | 23 | 23 | 23 |
| | 007 | 23 | 24 | 23 | 23 | 21 | 40 |
| | 008 | 22 | 21 | 23 | 21 | 20 | 20 |
| | 009 | 24 | 24 | 25 | 24 | 23 | 23 |
| | 010 | 26 | 26 | 27 | 26 | 25 | 23 |
| 2M | 016 | 27 | 26 | | | | |
| | 017 | 22 | 21 | | | | |
| | 018 | 30 | 29 | | | | |
| | 019 | 27 | 27 | | | | |
| | 020 | 24 | 23 | | | | |
| 3M | 027 | 24 | 23 | | | | |
| | 028 | 25 | 25 | | | | |
| | 029 | 30 | 30 | | | | |
| | 030 | 29 | 28 | | | | |
| | 031 | 25 | 25 | | | | |

APPENDIX 7 (cont) Food consumption - individual values (g/animal/day)

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Cage Number | Week Ra2 | Week 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4M | 040 | 20 | 21 | 23 | 23 | 21 | 25 | 23 | 24 | 24 | 24 | 24 | 27 |
| | 041 | 23 | 24 | 26 | 26 | 24 | 27 | 27 | 26 | 27 | 26 | 26 | 27 |
| | 042 | 24 | 24 | 25 | 27 | 24 | 28 | 27 | 27 | 28 | 28 | 28 | 28 |
| | 043 | 23 | 24 | 25 | 25 | 23 | 27 | 25 | 25 | 27 | 26 | 25 | 27 |
| | 044 | 23 | 22 | 23 | 25 | 23 | 27 | 25 | 24 | 24 | 24 | 23 | 28 |
| | 045 | 22 | 23 | 25 | 27 | 27 | 25 | 28 | 28 | 28 | 27 | 27 | 27 |
| | 046 | 18 | 19 | 20 | 22 | 22 | 23 | 23 | 22 | 23 | 22 | 22 | 22 |
| | 047 | 20 | 21 | 22 | 22 | 23 | 23 | 22 | 23 | 23 | 23 | 22 | 23 |
| | 048 | 22 | 24 | 24 | 26 | 27 | 27 | NW | NW | 28 | 27 | 27 | 28 |
| | 049 | 22 | 22 | 22 | 24 | 24 | 25 | 24 | 25 | 26 | 24 | 25 | 26 |

NW - Not weighed

APPENDIX 7 (cont) Food consumption - individual values (g/animal/day)

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Cage Number | Week 12 | Week 13 | Week R1 | R2 | R3 | R4 |
|---|---|---|---|---|---|---|---|
| 4M | 040 | 19 | 23 | | | | |
| | 041 | 26 | 25 | | | | |
| | 042 | 28 | 26 | | | | |
| | 043 | 26 | 25 | | | | |
| | 044 | 25 | 24 | | | | |
| | 045 | 26 | 26 | 25 | 26 | 25 | 26 |
| | 046 | 22 | 21 | 21 | 21 | 21 | 20 |
| | 047 | 22 | 21 | 22 | 22 | 21 | 21 |
| | 048 | 27 | 28 | 28 | 28 | 26 | 27 |
| | 049 | 26 | 25 | 25 | 25 | 24 | 24 |

APPENDIX 7 (cont) Food consumption - individual values (g/animal/day)

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Cage Number | Week Ra2 | Week 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | 057 | 18 | 19 | 20 | 20 | 19 | 21 | 19 | 19 | 19 | 19 | 21 | 20 |
| | 058 | 17 | 17 | 17 | 18 | 16 | 20 | 17 | 18 | 17 | 17 | 17 | 17 |
| | 059 | 18 | 18 | 19 | 21 | 18 | 22 | 19 | 19 | 19 | 18 | 19 | 19 |
| | 060 | 17 | 18 | 19 | 20 | 18 | 22 | 20 | 21 | 19 | 20 | 20 | 20 |
| | 061 | 17 | 17 | 17 | 18 | 17 | 20 | 19 | 18 | 18 | 19 | 20 | 19 |
| | 062 | 18 | 19 | 18 | 20 | 19 | 20 | 20 | 20 | 19 | 20 | 20 | 19 |
| | 063 | 19 | 19 | 21 | 23 | 20 | 22 | 22 | 22 | 20 | 20 | 22 | 22 |
| | 064 | 18 | 18 | 18 | 19 | 19 | 20 | 19 | 21 | 21 | 20 | 20 | 19 |
| | 065 | 18 | 17 | 18 | 20 | 21 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| | 066 | 18 | 18 | 18 | 19 | 19 | 20 | 19 | 21 | 19 | 20 | 20 | 20 |
| 2F | 072 | 17 | 18 | 19 | 20 | 18 | 22 | 20 | 20 | 21 | 19 | 20 | 20 |
| | 073 | 17 | 17 | 17 | 20 | 17 | 22 | 20 | 21 | 20 | 19 | 20 | 20 |
| | 074 | 20 | 20 | 20 | 21 | 18 | 22 | 21 | 21 | 21 | 21 | 21 | 20 |
| | 075 | 19 | 20 | 19 | 21 | 18 | 21 | 21 | 21 | 20 | 19 | 21 | 21 |
| | 076 | 19 | 19 | 18 | 21 | 18 | 22 | 20 | 20 | 18 | 19 | 19 | 19 |
| 3F | 083 | 18 | 20 | 20 | NW | 18 | 22 | 20 | 20 | 20 | NW | 19 | 20 |
| | 084 | 19 | 18 | 18 | 18 | 17 | 20 | 18 | 18 | Sp | 18 | 19 | 18 |
| | 085 | 18 | 18 | 18 | 20 | 17 | 21 | 21 | 21 | 19 | 20 | 19 | 19 |
| | 086 | 18 | 19 | 18 | 19 | 19 | 21 | 22 | 20 | 21 | 20 | 20 | 20 |
| | 087 | 18 | 18 | 20 | 22 | 18 | 23 | 22 | 21 | 21 | 21 | 21 | 20 |

Sp - Spilled, NW - Not weighed

APPENDIX 7 (cont) Food consumption - individual values (g/animal/day)

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Cage Number | Week 12 | 13 | Week R1 | R2 | R3 | R4 |
|---|---|---|---|---|---|---|---|
| 1F | 057 | 19 | 19 | | | | |
| | 058 | 15 | 16 | | | | |
| | 059 | 17 | 17 | | | | |
| | 060 | 18 | 18 | | | | |
| | 061 | 19 | 19 | | | | |
| | 062 | 17 | 20 | 19 | 17 | 16 | 18 |
| | 063 | 18 | 18 | 17 | 18 | 17 | 17 |
| | 064 | 18 | 20 | 18 | 19 | 17 | 18 |
| | 065 | 19 | 20 | 18 | 18 | 18 | 17 |
| | 066 | 18 | 19 | 19 | 19 | 18 | 18 |
| 2F | 072 | 19 | 17 | | | | |
| | 073 | 19 | 19 | | | | |
| | 074 | 19 | 20 | | | | |
| | 075 | 19 | 20 | | | | |
| | 076 | 16 | 17 | | | | |
| 3F | 083 | 18 | 19 | | | | |
| | 084 | 16 | 17 | | | | |
| | 085 | 17 | 18 | | | | |
| | 086 | 19 | 19 | | | | |
| | 087 | 19 | 19 | | | | |

APPENDIX 7 (cont) Food consumption - individual values (g/animal/day)

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Cage Number | Week Ra2 | Week 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4F | 094 | 16 | 17 | 17 | 19 | 16 | 20 | 19 | 18 | 19 | 18 | 18 | 18 |
| | 095 | 16 | 14 | 15 | 17 | 16 | 19 | 17 | 18 | 17 | 17 | 17 | 18 |
| | 096 | 18 | 18 | 17 | 19 | 17 | 21 | 20 | 20 | 19 | 20 | 19 | 18 |
| | 097 | 16 | 18 | 17 | 18 | 16 | 21 | 19 | 18 | 19 | 19 | 18 | 19 |
| | 098 | 19 | 20 | 20 | 21 | 19 | 24 | 22 | 22 | 20 | 21 | 21 | 20 |
| | 099 | 18 | 18 | 18 | 19 | 20 | 19 | 19 | 19 | 20 | 20 | 19 | 20 |
| | 100 | 18 | 14 | 20 | 19 | 18 | 19 | 20 | 20 | 20 | 19 | 20 | 20 |
| | 101 | 17 | 17 | 19 | 20 | 19 | 19 | 20 | 20 | 20 | 19 | 20 | 21 |
| | 102 | 16 | 15 | 16 | 17 | 16 | 17 | 17 | 17 | 17 | 17 | 17 | 18 |
| | 103 | 18 | 17 | 19 | 20 | 19 | 19 | 21 | 20 | 19 | 19 | 20 | 21 |

APPENDIX 7 (cont) Food consumption - individual values (g/animal/day)

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Cage Number | Week 12 | Week 13 | Week R1 | R2 | R3 | R4 |
|---|---|---|---|---|---|---|---|
| 4F | 094 | 17 | 17 | | | | |
| | 095 | 16 | 17 | | | | |
| | 096 | 17 | 18 | | | | |
| | 097 | 18 | 18 | | | | |
| | 098 | 19 | 19 | | | | |
| | 099 | 23 | 19 | 19 | 20 | 19 | 18 |
| | 100 | 18 | 19 | 19 | 20 | 19 | 19 |
| | 101 | 18 | 18 | 19 | 19 | 17 | 19 |
| | 102 | 15 | 22 | 16 | 16 | 15 | 16 |
| | 103 | 18 | 20 | 19 | 19 | 18 | 19 |

APPENDIX 8 Motor activity - individual values (number of beam breaks) – pretest horizontal

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | 1021 | 750 | 168 | 294 | 174 | 134 | 43 | 15 | 47 | 327 | 127 | 23 | 25 |
| | 1022 | 613 | 103 | 16 | 18 | 1 | 4 | 7 | 6 | 20 | 121 | 9 | 87 |
| | 1023 | 659 | 174 | 151 | 431 | 309 | 344 | 71 | 230 | 56 | 83 | 178 | 133 |
| | 1024 | 695 | 222 | 141 | 262 | 67 | 34 | 4 | 3 | 9 | 28 | 339 | 224 |
| | 1025 | 686 | 133 | 420 | 95 | 90 | 7 | 15 | 11 | 18 | 52 | 115 | 36 |
| | 1026 | 638 | 82 | 106 | 84 | 225 | 65 | 0 | 3 | 0 | 3 | 9 | 1 |
| | 1027 | 736 | 285 | 155 | 175 | 190 | 147 | 44 | 7 | 44 | 12 | 26 | 44 |
| | 1028 | 803 | 520 | 294 | 130 | 300 | 20 | 14 | 21 | 20 | 4 | 11 | 42 |
| | 1029 | 852 | 324 | 411 | 166 | 153 | 22 | 4 | 46 | 57 | 45 | 19 | 22 |
| | 1030 | 583 | 314 | 45 | 178 | 171 | 80 | 2 | 6 | 54 | 7 | 15 | 53 |
| 2M | 2021 | 557 | 362 | 244 | 146 | 266 | 178 | 79 | 15 | 25 | 42 | 43 | 21 |
| | 2022 | 684 | 95 | 139 | 222 | 235 | 75 | 32 | 9 | 14 | 7 | 138 | 35 |
| | 2023 | 567 | 274 | 41 | 4 | 0 | 1 | 0 | 22 | 27 | 6 | 79 | 2 |
| | 2024 | 804 | 299 | 7 | 64 | 48 | 2 | 26 | 221 | 320 | 81 | 2 | 13 |
| | 2025 | 739 | 310 | 441 | 257 | 127 | 41 | 53 | 13 | 15 | 5 | 18 | 49 |
| | 2026 | 391 | 80 | 24 | 105 | 320 | 28 | 50 | 42 | 39 | 257 | 17 | 4 |
| | 2027 | 683 | 345 | 328 | 60 | 13 | 21 | 41 | 0 | 1 | 0 | 8 | 24 |
| | 2028 | 562 | 33 | 104 | 44 | 79 | 318 | 44 | 16 | 4 | 64 | 59 | 40 |
| | 2029 | 802 | 326 | 32 | 10 | 8 | 5 | 27 | 49 | 12 | 11 | 73 | 25 |
| | 2030 | 763 | 388 | 123 | 377 | 107 | 139 | 55 | 90 | 86 | 15 | 58 | 21 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) – pretest horizontal

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3M | 3021 | 829 | 89 | 72 | 21 | 94 | 1 | 8 | 16 | 12 | 5 | 170 | 32 |
| | 3022 | 835 | 281 | 95 | 45 | 9 | 2 | 19 | 3 | 11 | 36 | 4 | 6 |
| | 3023 | 612 | 320 | 209 | 242 | 8 | 102 | 11 | 80 | 32 | 21 | 30 | 60 |
| | 3024 | 902 | 389 | 298 | 82 | 5 | 10 | 32 | 18 | 48 | 97 | 174 | 66 |
| | 3025 | 576 | 195 | 178 | 38 | 17 | 35 | 41 | 68 | 38 | 25 | 65 | 21 |
| | 3026 | 749 | 186 | 15 | 538 | 78 | 82 | 27 | 16 | 47 | 48 | 92 | 14 |
| | 3027 | 790 | 128 | 373 | 83 | 133 | 68 | 23 | 25 | 89 | 16 | 37 | 68 |
| | 3028 | 668 | 314 | 385 | 235 | 62 | 70 | 38 | 51 | 67 | 43 | 20 | 128 |
| | 3029 | 748 | 290 | 328 | 90 | 5 | 4 | 26 | 12 | 59 | 39 | 4 | 30 |
| | 3030 | 674 | 311 | 152 | 147 | 137 | 37 | 6 | 15 | 10 | 48 | 18 | 9 |
| 4M | 4021 | 637 | 461 | 326 | 263 | 120 | 55 | 36 | 1 | 32 | 44 | 4 | 12 |
| | 4022 | 791 | 478 | 382 | 79 | 44 | 38 | 36 | 34 | 8 | 35 | 52 | 2 |
| | 4023 | 638 | 287 | 242 | 146 | 139 | 56 | 22 | 21 | 199 | 94 | 21 | 61 |
| | 4024 | 714 | 165 | 16 | 121 | 279 | 111 | 17 | 14 | 19 | 8 | 19 | 9 |
| | 4025 | 697 | 238 | 133 | 98 | 108 | 54 | 76 | 24 | 86 | 65 | 18 | 9 |
| | 4026 | 711 | 374 | 249 | 350 | 119 | 14 | 75 | 7 | 30 | 63 | 66 | 109 |
| | 4027 | 579 | 186 | 244 | 212 | 78 | 128 | 39 | 14 | 95 | 12 | 35 | 39 |
| | 4028 | 637 | 317 | 132 | 1 | 27 | 39 | 61 | 130 | 125 | 87 | 138 | 84 |
| | 4029 | 741 | 404 | 128 | 426 | 184 | 321 | 89 | 103 | 91 | 23 | 0 | 0 |
| | 4030 | 515 | 228 | 180 | 232 | 101 | 69 | 126 | 260 | 96 | 216 | 92 | 55 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) – pretest horizontal

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | 1521 | 710 | 344 | 7 | 23 | 94 | 0 | 5 | 1 | 0 | 13 | 0 | 3 |
| | 1522 | 642 | 450 | 172 | 33 | 14 | 38 | 15 | 58 | 6 | 16 | 160 | 31 |
| | 1523 | 717 | 317 | 477 | 25 | 11 | 92 | 34 | 362 | 37 | 8 | 26 | 9 |
| | 1524 | 414 | 40 | 33 | 97 | 135 | 32 | 28 | 12 | 44 | 83 | 2 | 38 |
| | 1525 | 663 | 116 | 46 | 15 | 19 | 14 | 107 | 29 | 53 | 27 | 11 | 11 |
| | 1526 | 487 | 11 | 66 | 23 | 35 | 24 | 28 | 9 | 5 | 27 | 60 | 11 |
| | 1527 | 639 | 85 | 148 | 67 | 4 | 12 | 2 | 0 | 0 | 24 | 241 | 34 |
| | 1528 | 953 | 587 | 261 | 350 | 127 | 178 | 247 | 172 | 98 | 3 | 17 | 39 |
| | 1529 | 800 | 356 | 128 | 228 | 319 | 127 | 315 | 315 | 34 | 19 | 1 | 2 |
| | 1530 | 740 | 284 | 255 | 50 | 11 | 7 | 33 | 35 | 282 | 81 | 28 | 84 |
| 2F | 2521 | 725 | 409 | 105 | 55 | 170 | 127 | 11 | 0 | 4 | 37 | 1 | 2 |
| | 2522 | 551 | 375 | 119 | 222 | 148 | 23 | 45 | 8 | 7 | 1 | 2 | 12 |
| | 2523 | 531 | 170 | 5 | 9 | 15 | 4 | 23 | 30 | 66 | 46 | 65 | 41 |
| | 2524 | 672 | 206 | 44 | 45 | 31 | 35 | 30 | 66 | 168 | 107 | 2 | 43 |
| | 2525 | 631 | 339 | 74 | 13 | 34 | 0 | 22 | 37 | 63 | 25 | 107 | 45 |
| | 2526 | 681 | 167 | 107 | 240 | 136 | 149 | 152 | 397 | 28 | 24 | 37 | 11 |
| | 2527 | 684 | 253 | 90 | 8 | 211 | 361 | 14 | 0 | 7 | 0 | 18 | 12 |
| | 2528 | 914 | 788 | 203 | 30 | 81 | 32 | 59 | 16 | 11 | 27 | 381 | 346 |
| | 2529 | 653 | 362 | 70 | 428 | 139 | 192 | 22 | 4 | 260 | 267 | 124 | 54 |
| | 2530 | 666 | 215 | 74 | 38 | 42 | 33 | 50 | 261 | 92 | 16 | 46 | 20 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) – pretest horizontal

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3F | 3521 | 582 | 381 | 109 | 27 | 47 | 23 | 23 | 61 | 17 | 26 | 10 | 15 |
| | 3522 | 679 | 281 | 232 | 55 | 12 | 5 | 72 | 73 | 42 | 82 | 47 | 42 |
| | 3523 | 778 | 330 | 97 | 453 | 191 | 152 | 10 | 0 | 7 | 14 | 10 | 7 |
| | 3524 | 682 | 210 | 30 | 106 | 45 | 41 | 117 | 11 | 61 | 23 | 78 | 91 |
| | 3525 | 622 | 109 | 71 | 107 | 6 | 1 | 9 | 26 | 4 | 23 | 114 | 1 |
| | 3526 | 770 | 548 | 341 | 360 | 259 | 289 | 96 | 125 | 249 | 1 | 23 | 28 |
| | 3527 | 607 | 316 | 191 | 148 | 4 | 0 | 0 | 2 | 10 | 8 | 93 | 1 |
| | 3528 | 624 | 283 | 334 | 124 | 14 | 13 | 0 | 53 | 5 | 51 | 33 | 53 |
| | 3529 | 543 | 282 | 259 | 112 | 206 | 260 | 103 | 236 | 75 | 121 | 0 | 0 |
| | 3530 | 915 | 456 | 395 | 107 | 39 | 0 | 8 | 1 | 0 | 69 | 37 | 43 |
| 4F | 4521 | 692 | 314 | 87 | 26 | 10 | 9 | 18 | 1 | 60 | 60 | 1 | 23 |
| | 4522 | 700 | 281 | 172 | 34 | 7 | 1 | 0 | 151 | 410 | 422 | 44 | 60 |
| | 4523 | 585 | 384 | 164 | 8 | 140 | 8 | 11 | 87 | 30 | 16 | 12 | 13 |
| | 4524 | 714 | 426 | 232 | 337 | 75 | 3 | 2 | 42 | 174 | 27 | 5 | 9 |
| | 4525 | 523 | 410 | 338 | 233 | 25 | 4 | 3 | 2 | 27 | 179 | 18 | 166 |
| | 4526 | 496 | 210 | 236 | 47 | 42 | 3 | 1 | 16 | 59 | 114 | 0 | 50 |
| | 4527 | 540 | 317 | 113 | 92 | 14 | 15 | 5 | 6 | 40 | 66 | 94 | 40 |
| | 4528 | 779 | 388 | 314 | 305 | 93 | 1 | 0 | 5 | 0 | 111 | 25 | 27 |
| | 4529 | 647 | 181 | 265 | 73 | 3 | 282 | 184 | 39 | 64 | 16 | 7 | 35 |
| | 4530 | 559 | 308 | 95 | 40 | 86 | 133 | 347 | 79 | 44 | 20 | 48 | 59 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) – pretest vertical

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | 1021 | 28 | 2 | 16 | 1 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 |
| | 1022 | 39 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1023 | 22 | 3 | 1 | 23 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1024 | 43 | 9 | 2 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 11 |
| | 1025 | 37 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1026 | 28 | 1 | 0 | 0 | 7 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1027 | 40 | 7 | 7 | 9 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1028 | 51 | 43 | 23 | 3 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1029 | 85 | 15 | 26 | 14 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1030 | 26 | 18 | 0 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2M | 2021 | 21 | 17 | 8 | 4 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2022 | 37 | 5 | 6 | 17 | 8 | 0 | 0 | 0 | 0 | 0 | 5 | 0 |
| | 2023 | 33 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2024 | 43 | 12 | 0 | 0 | 0 | 0 | 0 | 9 | 9 | 0 | 0 | 0 |
| | 2025 | 37 | 9 | 21 | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2026 | 10 | 0 | 0 | 2 | 15 | 0 | 0 | 0 | 2 | 17 | 0 | 0 |
| | 2027 | 38 | 13 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2028 | 40 | 1 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2029 | 53 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2030 | 44 | 23 | 0 | 16 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) – pretest vertical

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3M | 3021 | 82 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| | 3022 | 43 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3023 | 44 | 12 | 10 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3024 | 52 | 22 | 7 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3025 | 23 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3026 | 31 | 2 | 0 | 42 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3027 | 65 | 2 | 31 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3028 | 37 | 12 | 20 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3029 | 45 | 9 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3030 | 31 | 8 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4M | 4021 | 37 | 40 | 15 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4022 | 63 | 26 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4023 | 36 | 12 | 14 | 4 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| | 4024 | 35 | 1 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4025 | 34 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4026 | 58 | 21 | 5 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4027 | 43 | 12 | 20 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4028 | 37 | 19 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4029 | 42 | 17 | 4 | 30 | 2 | 20 | 0 | 1 | 1 | 0 | 0 | 0 |
| | 4030 | 36 | 13 | 10 | 5 | 1 | 0 | 4 | 12 | 0 | 5 | 0 | 0 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) – pretest vertical

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | 1521 | 38 | 11 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1522 | 16 | 33 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1523 | 39 | 11 | 35 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 |
| | 1524 | 7 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1525 | 23 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| | 1526 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1527 | 30 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 |
| | 1528 | 39 | 25 | 8 | 17 | 3 | 4 | 7 | 3 | 0 | 0 | 0 | 0 |
| | 1529 | 69 | 41 | 11 | 15 | 26 | 7 | 23 | 14 | 0 | 0 | 0 | 0 |
| | 1530 | 47 | 16 | 7 | 0 | 0 | 0 | 0 | 2 | 12 | 0 | 0 | 0 |
| 2F | 2521 | 18 | 14 | 0 | 0 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2522 | 24 | 19 | 1 | 14 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2523 | 22 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2524 | 26 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 |
| | 2525 | 28 | 13 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2526 | 56 | 8 | 0 | 26 | 7 | 9 | 1 | 46 | 0 | 0 | 0 | 0 |
| | 2527 | 46 | 33 | 6 | 0 | 15 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2528 | 61 | 71 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 24 |
| | 2529 | 57 | 27 | 5 | 42 | 9 | 13 | 0 | 0 | 27 | 5 | 0 | 0 |
| | 2530 | 37 | 9 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) – pretest vertical

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3F | 3521 | 23 | 13 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3522 | 30 | 5 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3523 | 44 | 14 | 1 | 21 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3524 | 35 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3525 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3526 | 47 | 40 | 15 | 19 | 4 | 7 | 1 | 1 | 2 | 0 | 0 | 0 |
| | 3527 | 21 | 15 | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | 3528 | 31 | 12 | 11 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3529 | 22 | 14 | 2 | 9 | 0 | 3 | 0 | 12 | 0 | 1 | 0 | 0 |
| | 3530 | 58 | 10 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4F | 4521 | 18 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4522 | 25 | 4 | 2 | 0 | 0 | 0 | 0 | 1 | 16 | 14 | 0 | 0 |
| | 4523 | 34 | 15 | 5 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4524 | 60 | 25 | 8 | 36 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| | 4525 | 30 | 21 | 14 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| | 4526 | 17 | 7 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| | 4527 | 12 | 9 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4528 | 45 | 34 | 5 | 27 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 |
| | 4529 | 46 | 18 | 32 | 1 | 0 | 25 | 8 | 0 | 0 | 0 | 0 | 0 |
| | 4530 | 45 | 25 | 0 | 0 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) - week 4 horizontal

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | 1021 | 677 | 474 | 160 | 234 | 179 | 123 | 45 | 13 | 2 | 35 | 12 | 4 |
| | 1022 | 829 | 658 | 345 | 53 | 124 | 62 | 12 | 4 | 13 | 27 | 10 | 20 |
| | 1023 | 615 | 380 | 214 | 96 | 47 | 23 | 10 | 27 | 295 | 38 | 20 | 5 |
| | 1024 | 539 | 323 | 115 | 24 | 26 | 7 | 88 | 159 | 18 | 24 | 10 | 3 |
| | 1025 | 715 | 419 | 349 | 197 | 249 | 88 | 57 | 19 | 33 | 19 | 7 | 7 |
| | 1026 | 811 | 482 | 538 | 175 | 246 | 140 | 138 | 365 | 131 | 82 | 18 | 0 |
| | 1027 | 728 | 284 | 181 | 77 | 12 | 54 | 15 | 339 | 189 | 134 | 28 | 13 |
| | 1028 | 651 | 385 | 253 | 321 | 107 | 71 | 22 | 0 | 4 | 13 | 0 | 7 |
| | 1029 | 705 | 311 | 445 | 201 | 158 | 8 | 26 | 24 | 12 | 0 | 33 | 20 |
| | 1030 | 653 | 367 | 132 | 18 | 12 | 19 | 9 | 5 | 36 | 3 | 1 | 49 |
| 2M | 2021 | 676 | 358 | 255 | 113 | 85 | 10 | 9 | 12 | 17 | 20 | 20 | 11 |
| | 2022 | 786 | 477 | 376 | 233 | 129 | 31 | 14 | 4 | 10 | 4 | 59 | 15 |
| | 2023 | 560 | 508 | 457 | 340 | 87 | 25 | 18 | 4 | 5 | 7 | 4 | 4 |
| | 2024 | 925 | 667 | 428 | 188 | 52 | 30 | 19 | 0 | 33 | 2 | 41 | 6 |
| | 2025 | 548 | 336 | 275 | 354 | 16 | 14 | 140 | 62 | 0 | 11 | 13 | 30 |
| | 2026 | 430 | 325 | 155 | 62 | 252 | 6 | 33 | 22 | 0 | 0 | 14 | 80 |
| | 2027 | 749 | 386 | 283 | 169 | 179 | 72 | 71 | 9 | 1 | 8 | 4 | 15 |
| | 2028 | 514 | 321 | 263 | 59 | 17 | 9 | 5 | 20 | 6 | 123 | 264 | 175 |
| | 2029 | 686 | 414 | 206 | 211 | 71 | 103 | 68 | 9 | 24 | 18 | 4 | 3 |
| | 2030 | 527 | 354 | 117 | 190 | 121 | 73 | 1 | 14 | 15 | 27 | 38 | 5 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) - week 4 horizontal

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3M | 3021 | 826 | 538 | 261 | 413 | 103 | 41 | 11 | 3 | 1 | 24 | 0 | 8 |
| | 3022 | 795 | 635 | 489 | 254 | 121 | 200 | 2 | 18 | 5 | 32 | 3 | 0 |
| | 3023 | 481 | 360 | 275 | 282 | 73 | 129 | 12 | 3 | 13 | 5 | 11 | 31 |
| | 3024 | 757 | 300 | 418 | 237 | 170 | 323 | 228 | 236 | 126 | 93 | 2 | 4 |
| | 3025 | 619 | 356 | 169 | 147 | 23 | 7 | 13 | 6 | 41 | 0 | 29 | 6 |
| | 3026 | 476 | 329 | 99 | 205 | 196 | 89 | 15 | 0 | 12 | 0 | 22 | 0 |
| | 3027 | 804 | 442 | 406 | 281 | 108 | 20 | 132 | 38 | 32 | 5 | 29 | 4 |
| | 3028 | 660 | 416 | 281 | 389 | 263 | 271 | 109 | 95 | 5 | 0 | 24 | 8 |
| | 3029 | 697 | 476 | 387 | 305 | 239 | 43 | 170 | 15 | 3 | 10 | 35 | 196 |
| | 3030 | 723 | 404 | 330 | 281 | 215 | 50 | 181 | 259 | 65 | 42 | 85 | 86 |
| 4M | 4021 | 587 | 410 | 315 | 336 | 137 | 101 | 130 | 126 | 37 | 1 | 5 | 11 |
| | 4022 | 924 | 518 | 711 | 563 | 515 | 382 | 180 | 220 | 32 | 0 | 61 | 125 |
| | 4023 | 580 | 390 | 337 | 273 | 119 | 127 | 241 | 275 | 124 | 0 | 21 | 3 |
| | 4024 | 657 | 347 | 369 | 211 | 203 | 207 | 93 | 0 | 4 | 0 | 6 | 0 |
| | 4025 | 781 | 462 | 407 | 257 | 189 | 291 | 47 | 3 | 0 | 4 | 17 | 10 |
| | 4026 | 611 | 375 | 433 | 278 | 163 | 288 | 137 | 1 | 0 | 9 | 30 | 7 |
| | 4027 | 587 | 405 | 333 | 239 | 165 | 121 | 76 | 16 | 12 | 3 | 10 | 1 |
| | 4028 | 641 | 367 | 254 | 121 | 96 | 80 | 16 | 189 | 12 | 54 | 79 | 155 |
| | 4029 | 562 | 371 | 392 | 395 | 106 | 307 | 132 | 19 | 0 | 3 | 28 | 3 |
| | 4030 | 570 | 268 | 332 | 219 | 317 | 46 | 23 | 25 | 29 | 20 | 48 | 117 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) - week 4 horizontal

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | 1521 | 752 | 400 | 434 | 83 | 167 | 103 | 19 | 0 | 19 | 58 | 6 | 28 |
| | 1522 | 910 | 691 | 329 | 180 | 85 | 155 | 621 | 227 | 64 | 7 | 10 | 6 |
| | 1523 | 1031 | 856 | 713 | 414 | 274 | 41 | 233 | 580 | 260 | 57 | 10 | 6 |
| | 1524 | 512 | 220 | 63 | 65 | 31 | 70 | 25 | 35 | 23 | 11 | 13 | 55 |
| | 1525 | 795 | 540 | 256 | 215 | 71 | 1 | 1 | 5 | 5 | 14 | 51 | 17 |
| | 1526 | 629 | 616 | 528 | 237 | 356 | 60 | 69 | 1 | 58 | 2 | 81 | 22 |
| | 1527 | 855 | 511 | 72 | 49 | 400 | 50 | 22 | 22 | 13 | 212 | 18 | 2 |
| | 1528 | 749 | 452 | 252 | 301 | 125 | 203 | 82 | 45 | 3 | 15 | 19 | 17 |
| | 1529 | 844 | 524 | 249 | 267 | 335 | 136 | 26 | 5 | 6 | 312 | 251 | 19 |
| | 1530 | 705 | 564 | 436 | 419 | 269 | 105 | 66 | 7 | 7 | 17 | 14 | 5 |
| 2F | 2521 | 822 | 436 | 188 | 91 | 29 | 68 | 143 | 62 | 98 | 14 | 7 | 1 |
| | 2522 | 865 | 408 | 175 | 177 | 127 | 94 | 6 | 4 | 84 | 8 | 2 | 34 |
| | 2523 | 631 | 491 | 81 | 75 | 27 | 39 | 472 | 121 | 39 | 0 | 1 | 3 |
| | 2524 | 914 | 461 | 285 | 291 | 31 | 7 | 8 | 6 | 7 | 22 | 42 | 6 |
| | 2525 | 763 | 476 | 411 | 173 | 89 | 1 | 37 | 42 | 4 | 12 | 28 | 93 |
| | 2526 | 767 | 377 | 261 | 100 | 52 | 203 | 64 | 54 | 16 | 9 | 336 | 107 |
| | 2527 | 846 | 590 | 343 | 324 | 53 | 6 | 7 | 4 | 219 | 25 | 8 | 29 |
| | 2528 | 875 | 633 | 471 | 250 | 87 | 212 | 40 | 2 | 2 | 4 | 7 | 1 |
| | 2529 | 807 | 379 | 167 | 507 | 369 | 109 | 120 | 66 | 28 | 297 | 265 | 260 |
| | 2530 | 745 | 491 | 332 | 323 | 84 | 19 | 1 | 4 | 0 | 9 | 38 | 21 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) - week 4 horizontal

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3F | 3521 | 871 | 341 | 421 | 220 | 54 | 9 | 8 | 5 | 6 | 16 | 6 | 6 |
| | 3522 | 792 | 608 | 308 | 373 | 155 | 106 | 33 | 31 | 51 | 60 | 21 | 84 |
| | 3523 | 959 | 537 | 120 | 564 | 94 | 35 | 8 | 9 | 0 | 13 | 23 | 17 |
| | 3524 | 540 | 377 | 32 | 20 | 16 | 8 | 60 | 20 | 7 | 4 | 3 | 54 |
| | 3525 | 733 | 489 | 84 | 17 | 12 | 4 | 21 | 5 | 50 | 55 | 1 | 6 |
| | 3526 | 747 | 613 | 711 | 629 | 481 | 538 | 721 | 478 | 604 | 282 | 444 | 515 |
| | 3527 | 580 | 697 | 490 | 112 | 45 | 11 | 4 | 0 | 0 | 4 | 23 | 13 |
| | 3528 | 708 | 287 | 280 | 290 | 123 | 42 | 26 | 5 | 4 | 1 | 7 | 27 |
| | 3529 | 849 | 625 | 433 | 354 | 136 | 16 | 13 | 0 | 0 | 6 | 12 | 17 |
| | 3530 | 1141 | 376 | 419 | 522 | 209 | 86 | 76 | 2 | 1 | 2 | 1 | 1 |
| 4F | 4521 | 927 | 430 | 70 | 5 | 8 | 10 | 16 | 110 | 418 | 207 | 61 | 21 |
| | 4522 | 816 | 342 | 262 | 429 | 113 | 2 | 4 | 2 | 47 | 2 | 1 | 6 |
| | 4523 | 782 | 486 | 260 | 464 | 44 | 20 | 0 | 7 | 1 | 1 | 18 | 42 |
| | 4524 | 677 | 590 | 182 | 492 | 255 | 192 | 59 | 51 | 11 | 59 | 1 | 1 |
| | 4525 | 541 | 333 | 304 | 134 | 39 | 232 | 81 | 94 | 4 | 10 | 11 | 64 |
| | 4526 | 647 | 206 | 273 | 117 | 25 | 45 | 70 | 5 | 0 | 6 | 3 | 9 |
| | 4527 | 768 | 476 | 284 | 157 | 287 | 73 | 0 | 0 | 3 | 300 | 63 | 2 |
| | 4528 | 605 | 552 | 155 | 266 | 235 | 44 | 15 | 49 | 12 | 10 | 2 | 10 |
| | 4529 | 589 | 262 | 88 | 379 | 113 | 86 | 248 | 66 | 1 | 0 | 0 | 0 |
| | 4530 | 727 | 433 | 408 | 353 | 127 | 265 | 247 | 94 | 76 | 9 | 10 | 4 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) - week 4 vertical

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | 1021 | 38 | 25 | 3 | 12 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1022 | 39 | 21 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1023 | 40 | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 |
| | 1024 | 36 | 23 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1025 | 63 | 29 | 13 | 10 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1026 | 55 | 37 | 30 | 9 | 16 | 4 | 4 | 17 | 0 | 5 | 0 | 0 |
| | 1027 | 34 | 10 | 7 | 1 | 0 | 0 | 0 | 12 | 1 | 0 | 0 | 0 |
| | 1028 | 54 | 25 | 15 | 15 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1029 | 52 | 23 | 21 | 7 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1030 | 64 | 26 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 2M | 2021 | 50 | 14 | 10 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2022 | 44 | 19 | 17 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2023 | 39 | 30 | 18 | 23 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2024 | 90 | 52 | 20 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2025 | 43 | 23 | 18 | 20 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| | 2026 | 24 | 19 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| | 2027 | 39 | 22 | 18 | 6 | 6 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| | 2028 | 28 | 26 | 4 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 10 | 2 |
| | 2029 | 38 | 24 | 9 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2030 | 22 | 13 | 1 | 9 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) - week 4 vertical

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3M | 3021 | 51 | 23 | 11 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3022 | 36 | 44 | 17 | 15 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3023 | 43 | 21 | 6 | 8 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3024 | 40 | 9 | 23 | 12 | 4 | 18 | 3 | 2 | 0 | 0 | 0 | 0 |
| | 3025 | 37 | 12 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3026 | 34 | 15 | 1 | 1 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3027 | 43 | 19 | 8 | 14 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| | 3028 | 34 | 20 | 5 | 19 | 7 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3029 | 38 | 22 | 17 | 14 | 9 | 0 | 8 | 0 | 0 | 0 | 0 | 5 |
| | 3030 | 42 | 24 | 13 | 12 | 9 | 0 | 3 | 13 | 0 | 0 | 1 | 0 |
| 4M | 4021 | 30 | 17 | 10 | 11 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| | 4022 | 43 | 17 | 30 | 27 | 22 | 24 | 8 | 3 | 0 | 0 | 7 | 6 |
| | 4023 | 41 | 20 | 13 | 7 | 3 | 0 | 7 | 8 | 4 | 0 | 0 | 0 |
| | 4024 | 34 | 16 | 13 | 5 | 7 | 6 | 1 | 0 | 0 | 0 | 0 | 0 |
| | 4025 | 41 | 20 | 29 | 10 | 1 | 15 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4026 | 42 | 24 | 26 | 14 | 7 | 19 | 5 | 0 | 0 | 0 | 0 | 0 |
| | 4027 | 36 | 23 | 17 | 7 | 4 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| | 4028 | 41 | 18 | 18 | 2 | 2 | 2 | 0 | 12 | 0 | 0 | 2 | 1 |
| | 4029 | 52 | 29 | 25 | 28 | 0 | 20 | 1 | 0 | 0 | 0 | 0 | 0 |
| | 4030 | 33 | 6 | 11 | 5 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) - week 4 vertical

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | 1521 | 49 | 19 | 22 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1522 | 51 | 30 | 11 | 4 | 3 | 1 | 28 | 3 | 0 | 0 | 0 | 0 |
| | 1523 | 42 | 26 | 28 | 20 | 9 | 0 | 5 | 12 | 4 | 0 | 0 | 0 |
| | 1524 | 14 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1525 | 46 | 23 | 7 | 5 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1526 | 32 | 38 | 26 | 11 | 12 | 0 | 0 | 0 | 0 | 0 | 3 | 0 |
| | 1527 | 54 | 25 | 1 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1528 | 47 | 25 | 4 | 20 | 4 | 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1529 | 56 | 22 | 15 | 10 | 12 | 3 | 0 | 0 | 0 | 9 | 12 | 0 |
| | 1530 | 44 | 24 | 17 | 25 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2F | 2521 | 58 | 22 | 9 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| | 2522 | 44 | 14 | 2 | 6 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2523 | 32 | 23 | 0 | 0 | 0 | 0 | 29 | 1 | 0 | 0 | 0 | 0 |
| | 2524 | 38 | 29 | 5 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2525 | 73 | 42 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2526 | 43 | 30 | 6 | 4 | 0 | 6 | 0 | 0 | 0 | 0 | 20 | 1 |
| | 2527 | 46 | 32 | 16 | 15 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 |
| | 2528 | 69 | 35 | 24 | 13 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2529 | 62 | 42 | 19 | 38 | 14 | 4 | 6 | 1 | 0 | 24 | 13 | 6 |
| | 2530 | 25 | 29 | 6 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) - week 4 vertical

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3F | 3521 | 51 | 8 | 22 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3522 | 40 | 38 | 7 | 21 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3523 | 38 | 17 | 1 | 23 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3524 | 30 | 30 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3525 | 41 | 22 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3526 | 47 | 35 | 32 | 29 | 21 | 25 | 60 | 32 | 30 | 14 | 15 | 23 |
| | 3527 | 27 | 44 | 17 | 5 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3528 | 44 | 14 | 14 | 16 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3529 | 49 | 33 | 12 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3530 | 78 | 26 | 14 | 34 | 2 | 1 | 4 | 0 | 0 | 0 | 0 | 0 |
| 4F | 4521 | 41 | 18 | 1 | 0 | 0 | 0 | 0 | 0 | 21 | 7 | 2 | 0 |
| | 4522 | 53 | 18 | 12 | 23 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4523 | 48 | 18 | 10 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4524 | 35 | 40 | 3 | 20 | 4 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4525 | 23 | 18 | 17 | 10 | 0 | 17 | 1 | 0 | 0 | 0 | 0 | 0 |
| | 4526 | 32 | 12 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4527 | 37 | 14 | 7 | 4 | 5 | 0 | 0 | 0 | 0 | 8 | 0 | 0 |
| | 4528 | 27 | 30 | 7 | 19 | 7 | 0 | 0 | 3 | 0 | 0 | 0 | 0 |
| | 4529 | 33 | 16 | 3 | 32 | 2 | 0 | 12 | 0 | 0 | 0 | 0 | 0 |
| | 4530 | 53 | 27 | 29 | 22 | 4 | 15 | 10 | 1 | 4 | 0 | 0 | 0 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) - week 8 horizontal

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | 1021 | 674 | 401 | 191 | 51 | 66 | 236 | 122 | 4 | 0 | 1 | 17 | 2 |
| | 1022 | 738 | 359 | 94 | 261 | 56 | 108 | 95 | 1 | 0 | 8 | 8 | 3 |
| | 1023 | 609 | 338 | 116 | 79 | 10 | 39 | 21 | 48 | 2 | 0 | 0 | 0 |
| | 1024 | 579 | 354 | 176 | 110 | 66 | 11 | 14 | 4 | 5 | 14 | 21 | 0 |
| | 1025 | 562 | 448 | 374 | 156 | 28 | 26 | 15 | 41 | 7 | 5 | 3 | 128 |
| | 1026 | 682 | 371 | 386 | 163 | 18 | 33 | 213 | 47 | 51 | 11 | 35 | 1 |
| | 1027 | 771 | 321 | 218 | 69 | 14 | 6 | 0 | 5 | 4 | 27 | 5 | 3 |
| | 1028 | 539 | 355 | 169 | 117 | 9 | 9 | 20 | 12 | 41 | 22 | 0 | 1 |
| | 1029 | 516 | 373 | 175 | 128 | 72 | 1 | 0 | 3 | 7 | 3 | 16 | 1 |
| | 1030 | 525 | 344 | 173 | 99 | 16 | 21 | 3 | 1 | 0 | 6 | 24 | 6 |
| 2M | 2021 | 721 | 210 | 221 | 342 | 68 | 16 | 3 | 1 | 1 | 27 | 0 | 8 |
| | 2022 | 793 | 504 | 348 | 237 | 136 | 88 | 0 | 195 | 235 | 0 | 73 | 4 |
| | 2023 | 638 | 378 | 188 | 118 | 44 | 15 | 30 | 1 | 0 | 0 | 8 | 17 |
| | 2024 | 841 | 652 | 366 | 135 | 76 | 20 | 140 | 7 | 31 | 13 | 12 | 5 |
| | 2025 | 706 | 415 | 223 | 253 | 183 | 34 | 5 | 54 | 8 | 15 | 9 | 75 |
| | 2026 | 457 | 380 | 175 | 327 | 91 | 2 | 2 | 52 | 110 | 2 | 9 | 28 |
| | 2027 | 796 | 433 | 268 | 385 | 147 | 139 | 28 | 10 | 1 | 0 | 4 | 47 |
| | 2028 | 525 | 152 | 122 | 212 | 134 | 15 | 24 | 3 | 16 | 328 | 380 | 78 |
| | 2029 | 676 | 348 | 38 | 48 | 14 | 45 | 7 | 5 | 12 | 3 | 3 | 3 |
| | 2030 | 515 | 201 | 8 | 2 | 3 | 1 | 0 | 5 | 17 | 0 | 37 | 0 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) - week 8 horizontal

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3M | 3021 | 778 | 439 | 448 | 197 | 33 | 0 | 0 | 1 | 17 | 0 | 0 | 0 |
| | 3022 | 915 | 560 | 160 | 68 | 18 | 11 | 9 | 43 | 31 | 0 | 7 | 7 |
| | 3023 | 542 | 191 | 46 | 71 | 2 | 75 | 371 | 67 | 30 | 12 | 12 | 15 |
| | 3024 | 672 | 391 | 162 | 90 | 23 | 18 | 60 | 26 | 28 | 53 | 6 | 32 |
| | 3025 | 490 | 252 | 105 | 133 | 8 | 8 | 6 | 0 | 3 | 12 | 0 | 13 |
| | 3026 | 461 | 285 | 203 | 13 | 254 | 36 | 11 | 8 | 155 | 298 | 18 | 5 |
| | 3027 | 717 | 423 | 265 | 240 | 107 | 90 | 27 | 38 | 210 | 9 | 6 | 4 |
| | 3028 | 546 | 231 | 75 | 13 | 30 | 12 | 42 | 6 | 4 | 4 | 3 | 23 |
| | 3029 | 590 | 442 | 188 | 120 | 21 | 9 | 0 | 5 | 22 | 12 | 0 | 0 |
| | 3030 | 707 | 379 | 341 | 222 | 134 | 44 | 6 | 10 | 8 | 15 | 1 | 10 |
| 4M | 4021 | 726 | 266 | 160 | 193 | 150 | 91 | 154 | 270 | 99 | 204 | 5 | 66 |
| | 4022 | 846 | 555 | 240 | 181 | 213 | 19 | 12 | 115 | 28 | 7 | 31 | 3 |
| | 4023 | 474 | 344 | 72 | 26 | 50 | 1 | 14 | 7 | 40 | 62 | 9 | 11 |
| | 4024 | 608 | 519 | 226 | 298 | 158 | 49 | 9 | 11 | 46 | 9 | 15 | 7 |
| | 4025 | 718 | 183 | 81 | 433 | 43 | 8 | 2 | 11 | 5 | 3 | 20 | 76 |
| | 4026 | 629 | 364 | 98 | 226 | 28 | 24 | 113 | 146 | 10 | 4 | 41 | 262 |
| | 4027 | 490 | 340 | 206 | 109 | 114 | 92 | 55 | 26 | 3 | 12 | 7 | 0 |
| | 4028 | 660 | 397 | 215 | 268 | 2 | 4 | 195 | 304 | 72 | 19 | 1 | 6 |
| | 4029 | 496 | 351 | 203 | 31 | 3 | 7 | 16 | 0 | 3 | 1 | 2 | 8 |
| | 4030 | 629 | 163 | 27 | 8 | 7 | 8 | 12 | 4 | 25 | 33 | 7 | 5 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) - week 8 horizontal

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | 1521 | 697 | 354 | 138 | 148 | 12 | 27 | 12 | 0 | 0 | 0 | 0 | 368 |
| | 1522 | 859 | 585 | 339 | 192 | 140 | 142 | 16 | 8 | 109 | 66 | 8 | 10 |
| | 1523 | 836 | 675 | 493 | 43 | 12 | 27 | 12 | 4 | 7 | 3 | 26 | 8 |
| | 1524 | 578 | 390 | 115 | 88 | 16 | 14 | 0 | 0 | 8 | 9 | 11 | 5 |
| | 1525 | 687 | 402 | 57 | 289 | 440 | 31 | 53 | 5 | 75 | 20 | 8 | 4 |
| | 1526 | 746 | 575 | 359 | 307 | 269 | 162 | 59 | 16 | 240 | 186 | 5 | 137 |
| | 1527 | 653 | 249 | 38 | 30 | 171 | 3 | 10 | 5 | 6 | 240 | 27 | 19 |
| | 1528 | 764 | 339 | 285 | 157 | 309 | 91 | 123 | 22 | 49 | 109 | 13 | 23 |
| | 1529 | 671 | 441 | 199 | 71 | 27 | 5 | 8 | 44 | 10 | 4 | 8 | 1 |
| | 1530 | 679 | 480 | 172 | 30 | 4 | 19 | 19 | 21 | 7 | 13 | 7 | 17 |
| 2F | 2521 | 747 | 429 | 174 | 8 | 7 | 4 | 70 | 7 | 8 | 0 | 278 | 169 |
| | 2522 | 881 | 438 | 254 | 173 | 37 | 12 | 46 | 104 | 59 | 11 | 12 | 160 |
| | 2523 | 571 | 412 | 147 | 12 | 7 | 16 | 15 | 4 | 25 | 0 | 32 | 2 |
| | 2524 | 825 | 513 | 262 | 75 | 91 | 10 | 2 | 7 | 3 | 3 | 10 | 2 |
| | 2525 | 705 | 453 | 155 | 154 | 316 | 41 | 23 | 36 | 36 | 5 | 20 | 19 |
| | 2526 | 625 | 283 | 94 | 204 | 134 | 187 | 176 | 7 | 19 | 19 | 7 | 7 |
| | 2527 | 791 | 350 | 155 | 487 | 143 | 40 | 38 | 13 | 7 | 11 | 65 | 323 |
| | 2528 | 717 | 563 | 350 | 359 | 37 | 2 | 3 | 0 | 21 | 18 | 30 | 5 |
| | 2529 | 865 | 466 | 324 | 267 | 58 | 45 | 5 | 4 | 30 | 25 | 3 | 56 |
| | 2530 | 801 | 467 | 178 | 39 | 2 | 3 | 20 | 6 | 16 | 1 | 9 | 0 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) - week 8 horizontal

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3F | 3521 | 857 | 209 | 23 | 11 | 140 | 231 | 13 | 8 | 4 | 6 | 12 | 8 |
| | 3522 | 889 | 502 | 252 | 81 | 13 | 38 | 71 | 40 | 5 | 8 | 31 | 36 |
| | 3523 | 788 | 547 | 251 | 413 | 67 | 107 | 23 | 16 | 14 | 22 | 2 | 12 |
| | 3524 | 573 | 240 | 65 | 13 | 6 | 7 | 39 | 8 | 16 | 17 | 52 | 7 |
| | 3525 | 699 | 241 | 178 | 13 | 18 | 125 | 77 | 2 | 1 | 7 | 15 | 2 |
| | 3526 | 790 | 514 | 316 | 499 | 224 | 301 | 143 | 127 | 348 | 91 | 242 | 261 |
| | 3527 | 731 | 595 | 136 | 29 | 16 | 22 | 66 | 54 | 10 | 1 | 2 | 6 |
| | 3528 | 673 | 407 | 244 | 101 | 14 | 26 | 17 | 2 | 3 | 13 | 18 | 32 |
| | 3529 | 749 | 493 | 367 | 10 | 1 | 266 | 191 | 3 | 6 | 3 | 4 | 9 |
| | 3530 | 794 | 417 | 143 | 12 | 20 | 3 | 166 | 42 | 12 | 3 | 1 | 18 |
| 4F | 4521 | 629 | 254 | 293 | 278 | 275 | 65 | 54 | 140 | 480 | 403 | 62 | 0 |
| | 4522 | 595 | 373 | 424 | 39 | 6 | 16 | 9 | 116 | 8 | 84 | 31 | 6 |
| | 4523 | 834 | 573 | 168 | 273 | 124 | 5 | 15 | 16 | 9 | 35 | 11 | 8 |
| | 4524 | 708 | 396 | 431 | 194 | 85 | 34 | 13 | 9 | 33 | 8 | 43 | 52 |
| | 4525 | 391 | 240 | 146 | 8 | 3 | 7 | 7 | 12 | 45 | 100 | 10 | 6 |
| | 4526 | 536 | 265 | 235 | 115 | 243 | 217 | 13 | 7 | 22 | 1 | 0 | 0 |
| | 4527 | 753 | 592 | 416 | 182 | 75 | 201 | 38 | 10 | 1 | 24 | 0 | 5 |
| | 4528 | 665 | 123 | 65 | 10 | 10 | 79 | 490 | 54 | 0 | 4 | 1 | 7 |
| | 4529 | 648 | 380 | 31 | 21 | 48 | 14 | 15 | 3 | 6 | 3 | 6 | 12 |
| | 4530 | 593 | 348 | 160 | 38 | 13 | 2 | 1 | 12 | 15 | 146 | 200 | 31 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) - week 8 vertical

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | 1021 | 36 | 19 | 10 | 1 | 0 | 8 | 1 | 0 | 0 | 0 | 0 | 0 |
| | 1022 | 24 | 19 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1023 | 26 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1024 | 36 | 19 | 3 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1025 | 36 | 23 | 16 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| | 1026 | 37 | 16 | 15 | 12 | 0 | 0 | 7 | 0 | 0 | 0 | 1 | 0 |
| | 1027 | 26 | 14 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| | 1028 | 32 | 19 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1029 | 23 | 11 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1030 | 32 | 16 | 8 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2M | 2021 | 32 | 27 | 2 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2022 | 52 | 24 | 14 | 5 | 3 | 0 | 0 | 10 | 8 | 0 | 0 | 0 |
| | 2023 | 28 | 14 | 9 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2024 | 58 | 35 | 16 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| | 2025 | 40 | 17 | 6 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2026 | 24 | 22 | 3 | 9 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2027 | 58 | 21 | 13 | 21 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2028 | 29 | 4 | 7 | 11 | 3 | 0 | 0 | 0 | 0 | 10 | 15 | 2 |
| | 2029 | 33 | 12 | 5 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2030 | 25 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) - week 8 vertical

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3M | 3021 | 54 | 17 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3022 | 47 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3023 | 29 | 7 | 0 | 0 | 0 | 1 | 17 | 1 | 0 | 0 | 0 | 0 |
| | 3024 | 30 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3025 | 18 | 8 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3026 | 32 | 16 | 6 | 0 | 5 | 0 | 0 | 0 | 0 | 9 | 0 | 0 |
| | 3027 | 37 | 23 | 9 | 9 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 |
| | 3028 | 25 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| | 3029 | 20 | 11 | 4 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3030 | 25 | 10 | 11 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4M | 4021 | 37 | 10 | 7 | 5 | 1 | 0 | 1 | 6 | 1 | 1 | 0 | 1 |
| | 4022 | 35 | 24 | 9 | 5 | 13 | 0 | 0 | 4 | 0 | 0 | 1 | 0 |
| | 4023 | 23 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4024 | 28 | 17 | 6 | 14 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4025 | 38 | 7 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4026 | 36 | 15 | 1 | 7 | 1 | 0 | 3 | 7 | 0 | 0 | 0 | 11 |
| | 4027 | 24 | 12 | 6 | 2 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| | 4028 | 29 | 17 | 8 | 10 | 0 | 0 | 3 | 13 | 0 | 0 | 0 | 0 |
| | 4029 | 24 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4030 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) - week 8 vertical

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | 1521 | 46 | 24 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 |
| | 1522 | 38 | 19 | 14 | 4 | 2 | 6 | 0 | 0 | 5 | 0 | 0 | 0 |
| | 1523 | 37 | 41 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1524 | 24 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1525 | 33 | 12 | 0 | 9 | 18 | 0 | 3 | 0 | 2 | 0 | 0 | 0 |
| | 1526 | 49 | 47 | 30 | 15 | 12 | 11 | 0 | 0 | 14 | 0 | 0 | 4 |
| | 1527 | 26 | 16 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 9 | 0 | 0 |
| | 1528 | 35 | 9 | 9 | 2 | 8 | 2 | 4 | 0 | 1 | 2 | 0 | 0 |
| | 1529 | 36 | 20 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1530 | 31 | 19 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2F | 2521 | 24 | 19 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 3 |
| | 2522 | 40 | 12 | 14 | 3 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 5 |
| | 2523 | 23 | 18 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2524 | 59 | 32 | 22 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2525 | 33 | 25 | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2526 | 30 | 11 | 4 | 10 | 3 | 9 | 9 | 0 | 0 | 0 | 0 | 0 |
| | 2527 | 34 | 17 | 5 | 21 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 10 |
| | 2528 | 39 | 22 | 22 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2529 | 56 | 28 | 17 | 13 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2530 | 41 | 17 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) - week 8 vertical

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3F | 3521 | 41 | 5 | 0 | 0 | 5 | 17 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3522 | 58 | 29 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3523 | 32 | 21 | 4 | 16 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3524 | 26 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3525 | 43 | 11 | 10 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3526 | 37 | 25 | 4 | 20 | 8 | 14 | 3 | 3 | 11 | 3 | 10 | 12 |
| | 3527 | 28 | 31 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3528 | 38 | 16 | 10 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3529 | 41 | 16 | 11 | 0 | 0 | 17 | 4 | 0 | 0 | 0 | 0 | 0 |
| | 3530 | 40 | 12 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 |
| 4F | 4521 | 23 | 6 | 12 | 13 | 15 | 1 | 1 | 6 | 27 | 2 | 0 | 0 |
| | 4522 | 30 | 14 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4523 | 50 | 23 | 4 | 13 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4524 | 46 | 25 | 22 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4525 | 18 | 11 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| | 4526 | 23 | 9 | 12 | 2 | 10 | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4527 | 28 | 13 | 12 | 1 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4528 | 37 | 0 | 2 | 0 | 0 | 3 | 22 | 0 | 0 | 0 | 0 | 0 |
| | 4529 | 30 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4530 | 42 | 20 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 4 | 0 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) - week 13 horizontal

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | 1021 | 648 | 255 | 374 | 13 | 3 | 22 | 3 | 5 | 94 | 0 | 15 | 13 |
| | 1022 | 523 | 383 | 15 | 3 | 2 | 15 | 9 | 2 | 6 | 16 | 1 | 3 |
| | 1023 | 529 | 106 | 13 | 16 | 11 | 14 | 14 | 41 | 9 | 20 | 33 | 10 |
| | 1024 | 552 | 310 | 178 | 71 | 156 | 101 | 79 | 66 | 10 | 6 | 9 | 6 |
| | 1025 | 673 | 359 | 100 | 40 | 12 | 9 | 6 | 8 | 33 | 16 | 125 | 55 |
| | 1026 | 734 | 460 | 451 | 97 | 33 | 1 | 7 | 37 | 7 | 24 | 1 | 145 |
| | 1027 | 752 | 428 | 419 | 41 | 6 | 46 | 4 | 3 | 4 | 1 | 22 | 0 |
| | 1028 | 541 | 385 | 172 | 89 | 13 | 14 | 30 | 0 | 0 | 10 | 0 | 0 |
| | 1029 | 566 | 304 | 84 | 38 | 2 | 1 | 7 | 11 | 0 | 6 | 9 | 10 |
| | 1030 | 475 | 466 | 259 | 20 | 6 | 6 | 15 | 19 | 11 | 2 | 25 | 0 |
| 2M | 2021 | 569 | 82 | 12 | 2 | 5 | 28 | 2 | 1 | 1 | 0 | 0 | 2 |
| | 2022 | 681 | 356 | 135 | 51 | 58 | 14 | 22 | 20 | 16 | 1 | 30 | 255 |
| | 2023 | 525 | 361 | 92 | 33 | 30 | 1 | 15 | 0 | 0 | 16 | 5 | 18 |
| | 2024 | 780 | 430 | 255 | 85 | 59 | 9 | 169 | 24 | 53 | 60 | 23 | 50 |
| | 2025 | 553 | 104 | 79 | 165 | 14 | 5 | 69 | 51 | 30 | 6 | 12 | 6 |
| | 2026 | 306 | 225 | 108 | 56 | 44 | 78 | 15 | 12 | 0 | 0 | 195 | 252 |
| | 2027 | 611 | 416 | 128 | 51 | 18 | 5 | 4 | 15 | 1 | 1 | 7 | 1 |
| | 2028 | 432 | 198 | 70 | 80 | 3 | 0 | 133 | 54 | 2 | 0 | 0 | 8 |
| | 2029 | 618 | 253 | 78 | 51 | 152 | 33 | 33 | 49 | 11 | 7 | 7 | 2 |
| | 2030 | 723 | 418 | 219 | 57 | 131 | 9 | 1 | 29 | 0 | 1 | 10 | 6 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) - week 13 horizontal

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3M | 3021 | 670 | 418 | 114 | 9 | 21 | 104 | 3 | 25 | 0 | 11 | 5 | 1 |
| | 3022 | 694 | 182 | 109 | 42 | 6 | 33 | 9 | 5 | 0 | 52 | 3 | 1 |
| | 3023 | 565 | 450 | 111 | 75 | 41 | 43 | 0 | 5 | 2 | 1 | 1 | 10 |
| | 3024 | 686 | 247 | 101 | 33 | 13 | 67 | 13 | 5 | 7 | 7 | 0 | 3 |
| | 3025 | 615 | 337 | 225 | 403 | 0 | 2 | 19 | 22 | 16 | 33 | 47 | 2 |
| | 3026 | 619 | 370 | 164 | 9 | 44 | 1 | 152 | 41 | 0 | 0 | 0 | 55 |
| | 3027 | 705 | 562 | 128 | 71 | 16 | 21 | 17 | 11 | 4 | 5 | 0 | 3 |
| | 3028 | 590 | 359 | 232 | 204 | 42 | 23 | 25 | 16 | 7 | 8 | 31 | 6 |
| | 3029 | 639 | 474 | 127 | 104 | 31 | 14 | 14 | 15 | 13 | 164 | 152 | 24 |
| | 3030 | 665 | 459 | 288 | 168 | 85 | 39 | 5 | 6 | 3 | 3 | 124 | 13 |
| 4M | 4021 | 768 | 433 | 295 | 88 | 66 | 131 | 17 | 12 | 12 | 9 | 48 | 13 |
| | 4022 | 554 | 584 | 538 | 312 | 61 | 79 | 86 | 21 | 47 | 2 | 8 | 358 |
| | 4023 | 539 | 275 | 31 | 19 | 3 | 7 | 12 | 18 | 254 | 49 | 2 | 54 |
| | 4024 | 686 | 386 | 299 | 142 | 17 | 38 | 17 | 5 | 5 | 1 | 0 | 17 |
| | 4025 | 627 | 296 | 108 | 3 | 4 | 21 | 0 | 0 | 25 | 36 | 2 | 16 |
| | 4026 | 429 | 317 | 176 | 49 | 20 | 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4027 | 437 | 190 | 39 | 28 | 12 | 10 | 16 | 31 | 25 | 20 | 101 | 238 |
| | 4028 | 569 | 358 | 111 | 77 | 53 | 14 | 72 | 164 | 146 | 8 | 8 | 10 |
| | 4029 | 605 | 182 | 61 | 6 | 2 | 1 | 0 | 5 | 2 | 3 | 8 | 9 |
| | 4030 | 597 | 46 | 6 | 0 | 31 | 10 | 7 | 1 | 22 | 0 | 4 | 4 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) - week 13 horizontal

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | 1521 | 663 | 316 | 52 | 36 | 6 | 22 | 0 | 0 | 47 | 8 | 8 | 25 |
| | 1522 | 734 | 425 | 177 | 81 | 18 | 3 | 9 | 11 | 0 | 19 | 1 | 9 |
| | 1523 | 896 | 329 | 49 | 39 | 30 | 35 | 17 | 9 | 17 | 7 | 36 | 488 |
| | 1524 | 523 | 93 | 22 | 27 | 1 | 0 | 3 | 0 | 0 | 0 | 18 | 1 |
| | 1525 | 692 | 317 | 107 | 141 | 7 | 11 | 12 | 15 | 23 | 14 | 8 | 22 |
| | 1526 | 517 | 225 | 61 | 22 | 7 | 46 | 92 | 14 | 27 | 10 | 9 | 91 |
| | 1527 | 667 | 197 | 128 | 10 | 5 | 0 | 8 | 2 | 11 | 2 | 15 | 13 |
| | 1528 | 497 | 334 | 183 | 56 | 21 | 9 | 3 | 1 | 1 | 16 | 5 | 28 |
| | 1529 | 560 | 183 | 206 | 60 | 2 | 3 | 2 | 7 | 2 | 4 | 14 | 2 |
| | 1530 | 630 | 547 | 379 | 39 | 0 | 0 | 4 | 0 | 0 | 7 | 1 | 4 |
| 2F | 2521 | 912 | 325 | 247 | 171 | 91 | 0 | 0 | 0 | 0 | 48 | 2 | 2 |
| | 2522 | 847 | 309 | 144 | 11 | 4 | 3 | 13 | 25 | 339 | 238 | 298 | 106 |
| | 2523 | 677 | 178 | 51 | 19 | 0 | 0 | 0 | 1 | 2 | 15 | 0 | 8 |
| | 2524 | 735 | 442 | 196 | 108 | 97 | 13 | 4 | 0 | 8 | 28 | 22 | 5 |
| | 2525 | 679 | 230 | 393 | 50 | 2 | 12 | 0 | 0 | 15 | 29 | 30 | 6 |
| | 2526 | 434 | 199 | 219 | 89 | 9 | 10 | 1 | 15 | 3 | 4 | 5 | 10 |
| | 2527 | 671 | 526 | 77 | 15 | 4 | 11 | 4 | 20 | 5 | 16 | 3 | 145 |
| | 2528 | 697 | 389 | 304 | 44 | 9 | 14 | 1 | 11 | 14 | 7 | 8 | 53 |
| | 2529 | 772 | 426 | 225 | 116 | 30 | 19 | 4 | 35 | 13 | 25 | 16 | 6 |
| | 2530 | 769 | 241 | 439 | 398 | 224 | 387 | 306 | 75 | 13 | 6 | 117 | 74 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) - week 13 horizontal

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3F | 3521 | 622 | 289 | 50 | 9 | 4 | 11 | 3 | 49 | 61 | 34 | 3 | 3 |
| | 3522 | 728 | 122 | 5 | 28 | 6 | 21 | 17 | 3 | 24 | 21 | 3 | 7 |
| | 3523 | 538 | 630 | 384 | 154 | 142 | 236 | 92 | 223 | 161 | 312 | 70 | 10 |
| | 3524 | 664 | 235 | 51 | 18 | 42 | 27 | 201 | 169 | 11 | 5 | 5 | 0 |
| | 3525 | 746 | 346 | 23 | 28 | 17 | 31 | 7 | 4 | 3 | 99 | 249 | 10 |
| | 3526 | 511 | 229 | 229 | 393 | 101 | 344 | 214 | 257 | 133 | 271 | 251 | 250 |
| | 3527 | 576 | 423 | 318 | 57 | 5 | 6 | 8 | 48 | 0 | 6 | 0 | 3 |
| | 3528 | 770 | 277 | 133 | 7 | 10 | 17 | 13 | 0 | 2 | 0 | 8 | 5 |
| | 3529 | 827 | 326 | 221 | 76 | 8 | 11 | 4 | 23 | 24 | 13 | 13 | 3 |
| | 3530 | 755 | 295 | 318 | 16 | 11 | 6 | 1 | 0 | 3 | 1 | 1 | 1 |
| 4F | 4521 | 448 | 208 | 74 | 17 | 127 | 43 | 87 | 270 | 55 | 20 | 5 | 31 |
| | 4522 | 709 | 296 | 121 | 48 | 19 | 15 | 12 | 6 | 4 | 9 | 4 | 32 |
| | 4523 | 722 | 179 | 1 | 13 | 100 | 8 | 15 | 0 | 17 | 17 | 3 | 0 |
| | 4524 | 673 | 302 | 218 | 45 | 4 | 22 | 11 | 1 | 69 | 22 | 6 | 2 |
| | 4525 | 444 | 347 | 335 | 73 | 6 | 4 | 8 | 23 | 5 | 0 | 9 | 6 |
| | 4526 | 444 | 50 | 18 | 101 | 42 | 7 | 32 | 10 | 66 | 68 | 24 | 88 |
| | 4527 | 694 | 289 | 39 | 10 | 2 | 1 | 3 | 7 | 3 | 7 | 2 | 2 |
| | 4528 | 623 | 424 | 121 | 13 | 15 | 32 | 10 | 22 | 4 | 24 | 30 | 49 |
| | 4529 | 665 | 214 | 34 | 129 | 15 | 4 | 13 | 28 | 35 | 20 | 1 | 1 |
| | 4530 | 561 | 277 | 278 | 18 | 23 | 67 | 45 | 26 | 7 | 5 | 4 | 9 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) - week 13 vertical

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | 1021 | 35 | 7 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1022 | 22 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1023 | 20 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1024 | 30 | 15 | 7 | 2 | 6 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| | 1025 | 40 | 6 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1026 | 38 | 18 | 11 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1027 | 38 | 21 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1028 | 27 | 20 | 8 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1029 | 34 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1030 | 20 | 36 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2M | 2021 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2022 | 31 | 13 | 3 | 0 | 5 | 0 | 0 | 2 | 0 | 0 | 0 | 10 |
| | 2023 | 22 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2024 | 58 | 11 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2025 | 25 | 1 | 0 | 8 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| | 2026 | 10 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 6 |
| | 2027 | 29 | 20 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2028 | 28 | 11 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 |
| | 2029 | 25 | 7 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2030 | 39 | 12 | 9 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) - week 13 vertical

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3M | 3021 | 41 | 18 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3022 | 32 | 7 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3023 | 20 | 19 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3024 | 22 | 8 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3025 | 30 | 11 | 4 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3026 | 44 | 36 | 5 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 |
| | 3027 | 27 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3028 | 33 | 14 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3029 | 37 | 35 | 6 | 3 | 2 | 0 | 0 | 0 | 0 | 6 | 2 | 0 |
| | 3030 | 31 | 25 | 11 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 4M | 4021 | 32 | 13 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4022 | 17 | 18 | 19 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| | 4023 | 28 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 1 |
| | 4024 | 16 | 13 | 4 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4025 | 44 | 10 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4026 | 18 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4027 | 20 | 13 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| | 4028 | 33 | 20 | 4 | 0 | 0 | 0 | 0 | 5 | 3 | 0 | 0 | 0 |
| | 4029 | 38 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4030 | 20 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) - week 13 vertical

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | 1521 | 36 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1522 | 26 | 10 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1523 | 34 | 5 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 15 |
| | 1524 | 14 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1525 | 33 | 9 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1526 | 25 | 8 | 4 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 3 |
| | 1527 | 26 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1528 | 25 | 12 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1529 | 32 | 4 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1530 | 26 | 15 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2F | 2521 | 37 | 7 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2522 | 36 | 10 | 6 | 0 | 0 | 0 | 0 | 0 | 8 | 5 | 2 | 4 |
| | 2523 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2524 | 43 | 13 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2525 | 34 | 3 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2526 | 20 | 6 | 11 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2527 | 26 | 20 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| | 2528 | 36 | 9 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | 2529 | 41 | 21 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2530 | 37 | 5 | 17 | 18 | 8 | 10 | 11 | 1 | 0 | 0 | 0 | 0 |

APPENDIX 8 (cont) Motor activity - individual values (number of beam breaks) - week 13 vertical

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | 5 minute interval 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3F | 3521 | 27 | 14 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3522 | 41 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3523 | 21 | 32 | 16 | 8 | 1 | 10 | 1 | 6 | 2 | 16 | 0 | 0 |
| | 3524 | 29 | 8 | 0 | 0 | 0 | 0 | 5 | 7 | 0 | 0 | 0 | 0 |
| | 3525 | 48 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 10 | 0 |
| | 3526 | 21 | 10 | 7 | 17 | 2 | 18 | 7 | 20 | 3 | 25 | 17 | 21 |
| | 3527 | 24 | 18 | 23 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| | 3528 | 38 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3529 | 39 | 9 | 8 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3530 | 45 | 6 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4F | 4521 | 20 | 2 | 3 | 0 | 4 | 2 | 5 | 8 | 0 | 0 | 0 | 2 |
| | 4522 | 28 | 7 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4523 | 33 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4524 | 40 | 10 | 10 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| | 4525 | 27 | 19 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4526 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| | 4527 | 26 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4528 | 31 | 26 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4529 | 31 | 5 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4530 | 27 | 4 | 10 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

APPENDIX 9 Functional observational battery - individual assessments - pretest

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Home Cage Evaluations | | | | Handling Evaluations | | | | | | Open Field Evaluations | | | | | | | Motor Movements | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group /Sex | Animal Number | Post | Palp Close | Vocal | Motor | Rem | Hand | Chromo | Lac | Sal | Coat | Gait | Loco | Arous | Pilo | Exo | Urine | Feces | Fasc | Trem | Conv |
| 1M | 1021 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| | 1022 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| | 1023 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1024 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1025 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 2 | 0 | 1 | 1 | 1 |
| | 1026 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 3 | 0 | 1 | 1 | 1 |
| | 1027 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1028 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 2 | 1 | 1 | 1 |
| | 1029 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 3 | 1 | 1 | 1 | 1 |
| | 1030 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| 2M | 2021 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2022 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| | 2023 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2024 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2025 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2026 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 4 | 0 | 1 | 1 | 1 |
| | 2027 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2028 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2029 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2030 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - pretest

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Reflex Assessments | | | | | | | Grip Strength (grams) | | | | | | Landing Foot Splay (centimeters) | | | Body |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Animal | Visual | | Pinna | | | Pupil | Air | Forelimb | | | Hindlimb | | | | | | Temp |
| /Sex | Number | Appr | Aud | Reflex | Proprio | Pain | Resp | Right | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | (°C) |
| 1M | 1021 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 361 | 375 | **368** | 132 | 218 | **175** | 2.6 | 3.9 | **3.3** | 38.6 |
| | 1022 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 413 | 406 | **410** | 272 | 253 | **263** | 3.5 | 3.8 | **3.7** | 38.3 |
| | 1023 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 247 | 296 | **272** | 132 | 185 | **159** | 2.5 | 3.7 | **3.1** | 38.5 |
| | 1024 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 374 | 399 | **387** | 224 | 166 | **195** | 3.3 | 3.2 | **3.3** | 38.8 |
| | 1025 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 389 | 436 | **413** | 190 | 182 | **186** | 3.3 | 3.4 | **3.4** | 38.5 |
| | 1026 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 448 | 417 | **433** | 268 | 265 | **267** | 4.0 | 3.5 | **3.8** | 38.5 |
| | 1027 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 511 | 510 | **511** | 267 | 280 | **274** | 3.6 | 2.7 | **3.2** | 38.3 |
| | 1028 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 285 | 471 | **378** | 547 | 309 | **428** | 3.5 | 3.6 | **3.6** | 38.1 |
| | 1029 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 473 | 444 | **459** | 318 | 374 | **346** | 4.7 | 3.5 | **4.1** | 38.8 |
| | 1030 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 287 | 446 | **367** | 268 | 353 | **311** | 5.6 | 5.1 | **5.4** | 38.1 |
| 2M | 2021 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 228 | 368 | **298** | 130 | 116 | **123** | 3.4 | 3.6 | **3.5** | 37.9 |
| | 2022 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 303 | 424 | **364** | 175 | 195 | **185** | 4.0 | 3.4 | **3.7** | 38.7 |
| | 2023 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 546 | 539 | **543** | 244 | 234 | **239** | 3.5 | 4.2 | **3.9** | 38.1 |
| | 2024 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 390 | 434 | **412** | 207 | 212 | **210** | 4.1 | 3.9 | **4.0** | 38.6 |
| | 2025 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 457 | 478 | **468** | 275 | 232 | **254** | 5.1 | 5.3 | **5.2** | 38.6 |
| | 2026 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 478 | 498 | **488** | 221 | 235 | **228** | 4.9 | 4.5 | **4.7** | 38.0 |
| | 2027 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 633 | 644 | **639** | 315 | 273 | **294** | 3.5 | 2.9 | **3.2** | 37.9 |
| | 2028 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 481 | 436 | **459** | 258 | 272 | **265** | 5.0 | 3.8 | **4.4** | 37.9 |
| | 2029 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 537 | 528 | **533** | 395 | 318 | **357** | 5.0 | 3.9 | **4.5** | 38.7 |
| | 2030 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 513 | 287 | **400** | 452 | 384 | **418** | 6.4 | 5.9 | **6.2** | 38.1 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - pretest

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Home Cage Evaluations | | | | Handling Evaluations | | | | | | Open Field Evaluations | | | | | | | Motor Movements | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group /Sex | Animal Number | Post | Palp Close | Vocal | Motor | Rem | Hand | Chromo | Lac | Sal | Coat | Gait | Loco | Arous | Pilo | Exo | Urine | Feces | Fasc | Trem | Conv |
| 3M | 3021 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| | 3022 | 3 | 4 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3023 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3024 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3025 | 3 | 4 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 3 | 0 | 1 | 1 | 1 |
| | 3026 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 5 | 0 | 1 | 1 | 1 |
| | 3027 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3028 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3029 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3030 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| 4M | 4021 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4022 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4023 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4024 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4025 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4026 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4027 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4028 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4029 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4030 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - pretest

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | | Reflex Assessments | | | | | | Grip Strength (grams) | | | | | | Landing Foot Splay (centimeters) | | | Body |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Animal | Visual | Pinna | | | | Pupil | Air | Forelimb | | | Hindlimb | | | | | | Temp |
| /Sex | Number | Appr | Aud | Reflex | Proprio | Pain | Resp | Right | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | (°C) |
| 3M | 3021 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 408 | 398 | **403** | 205 | 239 | **222** | 4.1 | 2.7 | **3.4** | 38.4 |
| | 3022 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 345 | 407 | **376** | 175 | 184 | **180** | 3.0 | 2.7 | **2.9** | 38.0 |
| | 3023 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 482 | 505 | **494** | 262 | 239 | **251** | 3.6 | 5.3 | **4.5** | 38.2 |
| | 3024 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 429 | 399 | **414** | 249 | 187 | **218** | 5.6 | 3.9 | **4.8** | 38.1 |
| | 3025 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 354 | 403 | **379** | 176 | 172 | **174** | 3.6 | 4.1 | **3.9** | 38.3 |
| | 3026 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 549 | 601 | **575** | 300 | 238 | **269** | 2.6 | 2.1 | **2.4** | 38.3 |
| | 3027 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 364 | 446 | **405** | 229 | 236 | **233** | 3.1 | 3.7 | **3.4** | 37.9 |
| | 3028 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 541 | 638 | **590** | 378 | 426 | **402** | 4.5 | 4.5 | **4.5** | 37.7 |
| | 3029 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 382 | 429 | **406** | 417 | 404 | **411** | 3.1 | 3.5 | **3.3** | 37.9 |
| | 3030 | 2 | 4 | 1 | 1 | 2 | 1 | 1 | 457 | 420 | **439** | 286 | 355 | **321** | 5.4 | 4.9 | **5.2** | 38.2 |
| 4M | 4021 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 418 | 474 | **446** | 252 | 233 | **243** | 5.3 | 6.0 | **5.7** | 37.7 |
| | 4022 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 345 | 402 | **374** | 230 | 263 | **247** | 2.7 | 3.8 | **3.3** | 38.4 |
| | 4023 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 315 | 455 | **385** | 180 | 199 | **190** | 2.6 | 3.6 | **3.1** | 37.9 |
| | 4024 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 606 | 555 | **581** | 219 | 163 | **191** | 4.5 | 5.7 | **5.1** | 38.0 |
| | 4025 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 455 | 389 | **422** | 196 | 167 | **182** | 3.3 | 2.6 | **3.0** | 37.7 |
| | 4026 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 512 | 534 | **523** | 302 | 312 | **307** | 3.1 | 3.8 | **3.5** | 38.2 |
| | 4027 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 372 | 577 | **475** | 293 | 294 | **294** | 3.9 | 3.2 | **3.6** | 37.7 |
| | 4028 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 326 | 403 | **365** | 215 | 262 | **239** | 3.6 | 4.1 | **3.9** | 37.5 |
| | 4029 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 308 | 305 | **307** | 276 | 272 | **274** | 5.0 | 4.7 | **4.9** | 37.9 |
| | 4030 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 505 | 490 | **498** | 368 | 310 | **339** | 4.4 | 6.1 | **5.3** | 36.7 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - pretest

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Home Cage Evaluations | | | | Handling Evaluations | | | | | | Open Field Evaluations | | | | | | | Motor Movements | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group /Sex | Animal Number | Post | Palp Close | Vocal | Motor | Rem | Hand | Chromo | Lac | Sal | Coat | Gait | Loco | Arous | Pilo | Exo | Urine | Feces | Fasc | Trem | Conv |
| 1F | 1521 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| | 1522 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1523 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1524 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 3 | 0 | 1 | 1 | 1 |
| | 1525 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1526 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1527 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| | 1528 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1529 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1530 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| 2F | 2521 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2522 | 3 | 4 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2523 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| | 2524 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2525 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2526 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2527 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2528 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2529 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2530 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 2 | 0 | 1 | 1 | 1 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - pretest

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Reflex Assessments | | | | | | | Grip Strength (grams) | | | | | | Landing Foot Splay (centimeters) | | | Body |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Animal | Visual | | Pinna | | | Pupil | Air | Forelimb | | | Hindlimb | | | | | | Temp |
| /Sex | Number | Appr | Aud | Reflex | Proprio | Pain | Resp | Right | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | (°C) |
| 1F | 1521 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 372 | 435 | **404** | 234 | 258 | **246** | 4.6 | 4.9 | **4.8** | 38.5 |
| | 1522 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 483 | 484 | **484** | 187 | 186 | **187** | 4.3 | 3.2 | **3.8** | 38.3 |
| | 1523 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 302 | 437 | **370** | 205 | 217 | **211** | 2.7 | 3.5 | **3.1** | 38.3 |
| | 1524 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 468 | 522 | **495** | 275 | 225 | **250** | 4.6 | 4.6 | **4.6** | 38.2 |
| | 1525 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 437 | 469 | **453** | 262 | 248 | **255** | 4.1 | 5.0 | **4.6** | 38.2 |
| | 1526 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 408 | 478 | **443** | 339 | 334 | **337** | 4.1 | 3.2 | **3.7** | 38.7 |
| | 1527 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 498 | 508 | **503** | 234 | 234 | **234** | 2.4 | 3.0 | **2.7** | 38.0 |
| | 1528 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 527 | 595 | **561** | 267 | 257 | **262** | 2.9 | 4.7 | **3.8** | 38.4 |
| | 1529 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 520 | 420 | **470** | 350 | 311 | **331** | 4.5 | 3.9 | **4.2** | 38.8 |
| | 1530 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 329 | 354 | **342** | 280 | 358 | **319** | 4.7 | 4.4 | **4.6** | 38.4 |
| 2F | 2521 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 479 | 370 | **425** | 232 | 264 | **248** | 3.3 | 3.3 | **3.3** | 37.7 |
| | 2522 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 354 | 448 | **401** | 227 | 215 | **221** | 3.2 | 3.3 | **3.3** | 38.1 |
| | 2523 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 375 | 498 | **437** | 248 | 263 | **256** | 5.2 | 4.9 | **5.1** | 37.8 |
| | 2524 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 275 | 444 | **360** | 161 | 282 | **222** | 4.7 | 4.7 | **4.7** | 37.7 |
| | 2525 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 413 | 428 | **421** | 250 | 241 | **246** | 2.6 | 2.1 | **2.4** | 38.1 |
| | 2526 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 555 | 540 | **548** | 270 | 233 | **252** | 3.6 | 4.1 | **3.9** | 37.9 |
| | 2527 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 588 | 513 | **551** | 384 | 320 | **352** | 3.1 | 5.6 | **4.4** | 37.7 |
| | 2528 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 266 | 473 | **370** | 372 | 495 | **434** | 5.1 | 4.9 | **5.0** | 37.7 |
| | 2529 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 261 | 344 | **303** | 297 | 301 | **299** | 4.2 | 4.3 | **4.3** | 38.3 |
| | 2530 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 278 | 226 | **252** | 396 | 222 | **309** | 4.9 | 4.7 | **4.8** | 38.1 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - pretest

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Home Cage Evaluations | | | | Handling Evaluations | | | | | | Open Field Evaluations | | | | | | | Motor Movements | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group /Sex | Animal Number | Post | Palp Close | Vocal | Motor | Rem | Hand | Chromo | Lac | Sal | Coat | Gait | Loco | Arous | Pilo | Exo | Urine | Feces | Fasc | Trem | Conv |
| 3F | 3521 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3522 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3523 | 3 | 4 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3524 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3525 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3526 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3527 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| | 3528 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3529 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3530 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| 4F | 4521 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4522 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4523 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| | 4524 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4525 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| | 4526 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4527 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| | 4528 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4529 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4530 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 2 | 0 | 1 | 1 | 1 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - pretest

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Reflex Assessments | | | | | | | Grip Strength (grams) | | | | | | Landing Foot Splay | | | Body |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Animal | Visual | | Pinna | | | Pupil | Air | Forelimb | | | Hindlimb | | | (centimeters) | | | Temp |
| /Sex | Number | Appr | Aud | Reflex | Proprio | Pain | Resp | Right | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | (°C) |
| 3F | 3521 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 333 | 429 | **381** | 238 | 221 | **230** | 4.1 | 5.1 | **4.6** | 38.2 |
| | 3522 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 393 | 417 | **405** | 199 | 215 | **207** | 4.1 | 5.5 | **4.8** | 37.9 |
| | 3523 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 459 | 492 | **476** | 213 | 203 | **208** | 4.2 | 5.0 | **4.6** | 37.5 |
| | 3524 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 451 | 478 | **465** | 229 | 286 | **258** | 4.9 | 4.7 | **4.8** | 38.1 |
| | 3525 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 457 | 462 | **460** | 277 | 188 | **233** | 3.1 | 3.3 | **3.2** | 37.9 |
| | 3526 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 593 | 553 | **573** | 402 | 287 | **345** | 3.3 | 3.9 | **3.6** | 37.9 |
| | 3527 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 504 | 525 | **515** | 273 | 206 | **240** | 4.3 | 3.5 | **3.9** | 37.5 |
| | 3528 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 516 | 626 | **571** | 308 | 258 | **283** | 2.9 | 4.1 | **3.5** | 38.6 |
| | 3529 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 264 | 298 | **281** | 338 | 251 | **295** | 3.4 | 3.7 | **3.6** | 37.6 |
| | 3530 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 461 | 508 | **485** | 414 | 333 | **374** | 4.9 | 5.2 | **5.1** | 37.2 |
| 4F | 4521 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 294 | 387 | **341** | 258 | 241 | **250** | 3.4 | 3.2 | **3.3** | 37.4 |
| | 4522 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 393 | 394 | **394** | 231 | 260 | **246** | 3.5 | 2.2 | **2.9** | 38.3 |
| | 4523 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 250 | 384 | **317** | 205 | 177 | **191** | 3.6 | 3.3 | **3.5** | 37.9 |
| | 4524 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 410 | 475 | **443** | 191 | 196 | **194** | 2.4 | 3.4 | **2.9** | 37.8 |
| | 4525 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 443 | 545 | **494** | 263 | 274 | **269** | 2.8 | 2.8 | **2.8** | 38.5 |
| | 4526 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 387 | 467 | **427** | 220 | 215 | **218** | 3.1 | 3.9 | **3.5** | 37.7 |
| | 4527 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 280 | 420 | **350** | 217 | 251 | **234** | 4.1 | 2.8 | **3.5** | 38.1 |
| | 4528 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 583 | 374 | **479** | 341 | 401 | **371** | 3.5 | 4.3 | **3.9** | 37.5 |
| | 4529 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 541 | 534 | **538** | 328 | 313 | **321** | 5.9 | 4.5 | **5.2** | 37.7 |
| | 4530 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 519 | 510 | **515** | 219 | 267 | **243** | 3.9 | 3.8 | **3.9** | 37.5 |

APPENDIX 9 (cont) Functional observational battery - individual assessments -week 4

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Home Cage Evaluations | | | | Handling Evaluations | | | | | | Open Field Evaluations | | | | | | | Motor Movements | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group /Sex | Animal Number | Post | Palp Close | Vocal | Motor | Rem | Hand | Chromo | Lac | Sal | Coat | Gait | Loco | Arous | Pilo | Exo | Urine | Feces | Fasc | Trem | Conv |
| 1M | 1021 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 2 | 1 | 1 | 1 |
| | 1022 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 3 | 0 | 1 | 1 | 1 |
| | 1023 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| | 1024 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1025 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 4 | 0 | 1 | 1 | 1 |
| | 1026 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| | 1027 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 1 | 1 | 0 | 2 | 1 | 1 | 1 |
| | 1028 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1029 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1030 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 6 | 0 | 1 | 1 | 1 |
| 2M | 2021 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7.1 | 1 | 3 | 1 | 1 | 3 | 2 | 1 | 1 | 1 |
| | 2022 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2023 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2024 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2025 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2026 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| | 2027 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| | 2028 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| | 2029 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2030 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 5 | 0 | 1 | 1 | 1 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - week 4

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Reflex Assessments | | | | | | | Grip Strength (grams) | | | | | | Landing Foot Splay (centimeters) | | | Body |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Animal | Visual | | Pinna | | | Pupil | Air | Forelimb | | | Hindlimb | | | | | | Temp |
| /Sex | Number | Appr | Aud | Reflex | Proprio | Pain | Resp | Right | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | (°C) |
| 1M | 1021 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 896 | 1001 | **949** | 729 | 657 | **693** | 3.7 | 3.9 | **3.8** | 38.7 |
| | 1022 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1281 | 1286 | **1284** | 888 | 980 | **934** | 5.0 | 4.3 | **4.7** | 38.4 |
| | 1023 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 796 | 994 | **895** | 483 | 523 | **503** | 3.6 | 3.9 | **3.8** | 37.9 |
| | 1024 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1189 | 1178 | **1184** | 777 | 797 | **787** | 4.1 | 5.8 | **5.0** | 37.4 |
| | 1025 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1152 | 1427 | **1290** | 704 | 754 | **729** | 4.0 | 4.6 | **4.3** | 37.7 |
| | 1026 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1116 | 1459 | **1288** | 820 | 675 | **748** | 4.5 | 4.2 | **4.4** | 37.9 |
| | 1027 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1122 | 1317 | **1220** | 645 | 632 | **639** | 4.6 | 5.6 | **5.1** | 39.1 |
| | 1028 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 850 | 640 | **745** | 824 | 826 | **825** | 5.6 | 7.9 | **6.8** | 37.5 |
| | 1029 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1052 | 904 | **978** | 757 | 703 | **730** | 5.2 | 5.7 | **5.5** | 37.8 |
| | 1030 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1013 | 951 | **982** | 649 | 757 | **703** | 5.0 | 7.2 | **6.1** | 38.1 |
| 2M | 2021 | 2 | 4 | 1 | 1 | 2 | 1 | 1 | 990 | 911 | **951** | 772 | 621 | **697** | 3.7 | 4.1 | **3.9** | 38.8 |
| | 2022 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 645 | 859 | **752** | 724 | 617 | **671** | 3.7 | 5.4 | **4.6** | 38.0 |
| | 2023 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1224 | 1232 | **1228** | 507 | 602 | **555** | 4.6 | 5.5 | **5.1** | 37.2 |
| | 2024 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1107 | 890 | **999** | 879 | 595 | **737** | 5.1 | 3.8 | **4.5** | 37.6 |
| | 2025 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1220 | 1232 | **1226** | 711 | 625 | **668** | 5.2 | 5.6 | **5.4** | 38.4 |
| | 2026 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1062 | 1211 | **1137** | 566 | 850 | **708** | 7.9 | 8.0 | **8.0** | 37.1 |
| | 2027 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1146 | 1100 | **1123** | 727 | 719 | **723** | 6.6 | 6.9 | **6.8** | 38.9 |
| | 2028 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1239 | 1272 | **1256** | 729 | 800 | **765** | 8.6 | 9.3 | **9.0** | 38.7 |
| | 2029 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1244 | 1372 | **1308** | 724 | 795 | **760** | 4.7 | 5.4 | **5.1** | 38.5 |
| | 2030 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 999 | 1061 | **1030** | 687 | 708 | **698** | 5.4 | 6.3 | **5.9** | 37.5 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - week 4

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Home Cage Evaluations | | | | Handling Evaluations | | | | | | Open Field Evaluations | | | | | | | Motor Movements | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group /Sex | Animal Number | Post | Palp Close | Vocal | Motor | Rem | Hand | Chromo | Lac | Sal | Coat | Gait | Loco | Arous | Pilo | Exo | Urine | Feces | Fasc | Trem | Conv |
| 3M | 3021 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 3 | 0 | 1 | 1 | 1 |
| | 3022 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3023 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 4 | 0 | 1 | 1 | 1 |
| | 3024 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 4 | 0 | 1 | 1 | 1 |
| | 3025 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 3 | 0 | 1 | 1 | 1 |
| | 3026 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3027 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 6 | 0 | 1 | 1 | 1 |
| | 3028 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3029 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 3 | 0 | 1 | 1 | 1 |
| | 3030 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| 4M | 4021 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4022 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4023 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 5 | 0 | 1 | 1 | 1 |
| | 4024 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4025 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4026 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4027 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4028 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 4 | 0 | 1 | 1 | 1 |
| | 4029 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 4 | 0 | 1 | 1 | 1 |
| | 4030 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 2 | 0 | 1 | 1 | 1 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - week 4

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Reflex Assessments | | | | | | | Grip Strength (grams) | | | | | | Landing Foot Splay (centimeters) | | | Body |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Animal | Visual | | Pinna | | | Pupil | Air | Forelimb | | | Hindlimb | | | | | | Temp |
| /Sex | Number | Appr | Aud | Reflex | Proprio | Pain | Resp | Right | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | (°C) |
| 3M | 3021 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1129 | 1254 | **1192** | 484 | 696 | **590** | 4.3 | 5.7 | **5.0** | 38.5 |
| | 3022 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1096 | 1280 | **1188** | 568 | 738 | **653** | 5.2 | 5.7 | **5.5** | 37.4 |
| | 3023 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1250 | 1199 | **1225** | 780 | 862 | **821** | 7.0 | 6.8 | **6.9** | 37.2 |
| | 3024 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1072 | 995 | **1034** | 779 | 682 | **731** | 5.4 | 6.6 | **6.0** | 38.0 |
| | 3025 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1111 | 1133 | **1122** | 691 | 673 | **682** | 5.1 | 6.4 | **5.8** | 37.9 |
| | 3026 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1246 | 1377 | **1312** | 433 | 815 | **624** | 5.6 | 4.3 | **5.0** | 38.1 |
| | 3027 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 937 | 898 | **918** | 428 | 624 | **526** | 3.6 | 4.4 | **4.0** | 38.1 |
| | 3028 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 973 | 903 | **938** | 613 | 655 | **634** | 5.0 | 4.9 | **5.0** | 37.2 |
| | 3029 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 703 | 935 | **819** | 612 | 537 | **575** | 3.6 | 4.9 | **4.3** | 37.4 |
| | 3030 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1116 | 1031 | **1074** | 767 | 660 | **714** | 4.3 | 5.9 | **5.1** | 37.7 |
| 4M | 4021 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1093 | 1181 | **1137** | 797 | 775 | **786** | 8.0 | 7.9 | **8.0** | 37.6 |
| | 4022 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1041 | 1187 | **1114** | 519 | 684 | **602** | 4.2 | 7.1 | **5.7** | 37.6 |
| | 4023 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1211 | 1115 | **1163** | 597 | 594 | **596** | 5.0 | 5.9 | **5.5** | 38.9 |
| | 4024 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1265 | 1116 | **1191** | 658 | 665 | **662** | 6.0 | 6.8 | **6.4** | 37.3 |
| | 4025 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1131 | 1222 | **1177** | 770 | 630 | **700** | 5.0 | 4.4 | **4.7** | 38.3 |
| | 4026 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1222 | 1148 | **1185** | 963 | 619 | **791** | 6.3 | 5.4 | **5.9** | 38.2 |
| | 4027 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1103 | 1195 | **1149** | 704 | 614 | **659** | 4.9 | 6.7 | **5.8** | 38.5 |
| | 4028 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 896 | 1224 | **1060** | 675 | 639 | **657** | 5.5 | 5.9 | **5.7** | 38.7 |
| | 4029 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1006 | 926 | **966** | 392 | 551 | **472** | 4.8 | 5.7 | **5.3** | 38.6 |
| | 4030 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1080 | 1139 | **1110** | 512 | 915 | **714** | 4.2 | 3.7 | **4.0** | 38.0 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - week 4

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Home Cage Evaluations | | | | Handling Evaluations | | | | | | Open Field Evaluations | | | | | | | Motor Movements | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group /Sex | Animal Number | Post | Palp Close | Vocal | Motor | Rem | Hand | Chromo | Lac | Sal | Coat | Gait | Loco | Arous | Pilo | Exo | Urine | Feces | Fasc | Trem | Conv |
| 1F | 1521 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1522 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1523 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1524 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1525 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1526 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1527 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1528 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1529 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1530 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| 2F | 2521 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2522 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2523 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2524 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2525 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2526 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| | 2527 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2528 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2529 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2530 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - week 4

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Reflex Assessments | | | | | | | Grip Strength (grams) | | | | | | Landing Foot Splay (centimeters) | | | Body |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Animal | Visual | | Pinna | | | Pupil | Air | Forelimb | | | Hindlimb | | | | | | Temp |
| /Sex | Number | Appr | Aud | Reflex | Proprio | Pain | Resp | Right | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | (°C) |
| 1F | 1521 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1072 | 950 | **1011** | 637 | 810 | **724** | 6.1 | 6.7 | **6.4** | 38.7 |
| | 1522 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1072 | 1076 | **1074** | 599 | 676 | **638** | 4.5 | 3.9 | **4.2** | 38.9 |
| | 1523 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 830 | 971 | **901** | 368 | 505 | **437** | 4.5 | 4.1 | **4.3** | 39.2 |
| | 1524 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1055 | 1168 | **1112** | 661 | 501 | **581** | 4.6 | 5.5 | **5.1** | 37.5 |
| | 1525 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 897 | 1046 | **972** | 747 | 795 | **771** | 3.7 | 4.7 | **4.2** | 38.7 |
| | 1526 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 909 | 1000 | **955** | 807 | 513 | **660** | 4.5 | 4.4 | **4.5** | 37.7 |
| | 1527 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1041 | 1181 | **1111** | 513 | 483 | **498** | 5.1 | 5.6 | **5.4** | 39.2 |
| | 1528 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1092 | 1105 | **1099** | 683 | 495 | **589** | 4.7 | 5.4 | **5.1** | 38.2 |
| | 1529 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 802 | 1031 | **917** | 568 | 596 | **582** | 5.5 | 5.1 | **5.3** | 39.4 |
| | 1530 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 882 | 1109 | **996** | 619 | 621 | **620** | 4.9 | 5.4 | **5.2** | 38.4 |
| 2F | 2521 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1028 | 1097 | **1063** | 609 | 795 | **702** | 5.5 | 6.8 | **6.2** | 39.3 |
| | 2522 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1078 | 948 | **1013** | 607 | 434 | **521** | 5.5 | 6.6 | **6.1** | 39.1 |
| | 2523 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1000 | 1163 | **1082** | 672 | 643 | **658** | 6.0 | 8.9 | **7.5** | 38.2 |
| | 2524 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 885 | 1057 | **971** | 388 | 480 | **434** | 6.1 | 8.2 | **7.2** | 38.4 |
| | 2525 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 846 | 1118 | **982** | 539 | 531 | **535** | 3.5 | 3.6 | **3.6** | 38.0 |
| | 2526 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 788 | 1055 | **922** | 555 | 574 | **565** | 6.2 | 6.3 | **6.3** | 37.2 |
| | 2527 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1076 | 1105 | **1091** | 863 | 749 | **806** | 4.9 | 6.1 | **5.5** | 38.8 |
| | 2528 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1130 | 920 | **1025** | 515 | 371 | **443** | 3.4 | 3.7 | **3.6** | 38.7 |
| | 2529 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1040 | 1126 | **1083** | 574 | 694 | **634** | 4.6 | 4.2 | **4.4** | 39.1 |
| | 2530 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 884 | 896 | **890** | 655 | 429 | **542** | 2.8 | 3.0 | **2.9** | 37.8 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - week 4

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Home Cage Evaluations | | | | Handling Evaluations | | | | | | Open Field Evaluations | | | | | | | Motor Movements | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group /Sex | Animal Number | Post | Palp Close | Vocal | Motor | Rem | Hand | Chromo | Lac | Sal | Coat | Gait | Loco | Arous | Pilo | Exo | Urine | Feces | Fasc | Trem | Conv |
| 3F | 3521 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3522 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| | 3523 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3524 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3525 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3526 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3527 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3528 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3529 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3530 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| 4F | 4521 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4522 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4523 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4524 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4525 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4526 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4527 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4528 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4529 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4530 | 3 | 4 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - week 4

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Reflex Assessments | | | | | | | Grip Strength (grams) | | | | | | Landing Foot Splay (centimeters) | | | Body |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Animal | Visual | | Pinna | | | Pupil | Air | Forelimb | | | Hindlimb | | | | | | Temp |
| /Sex | Number | Appr | Aud | Reflex | Proprio | Pain | Resp | Right | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | (°C) |
| 3F | 3521 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 942 | 914 | **928** | 659 | 681 | **670** | 7.3 | 8.7 | **8.0** | 39.3 |
| | 3522 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 744 | 997 | **871** | 429 | 442 | **436** | 3.3 | 4.0 | **3.7** | 38.9 |
| | 3523 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 884 | 1096 | **990** | 392 | 565 | **479** | 5.6 | 6.7 | **6.2** | 38.6 |
| | 3524 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1299 | 1294 | **1297** | 909 | 722 | **816** | 6.6 | 6.9 | **6.8** | 39.3 |
| | 3525 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1146 | 1038 | **1092** | 635 | 614 | **625** | 4.2 | 4.8 | **4.5** | 38.7 |
| | 3526 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 733 | 1304 | **1019** | 549 | 619 | **584** | 4.3 | 4.3 | **4.3** | 39.0 |
| | 3527 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1146 | 1141 | **1144** | 491 | 412 | **452** | 4.3 | 6.1 | **5.2** | 38.6 |
| | 3528 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1278 | 1090 | **1184** | 518 | 522 | **520** | 4.2 | 5.3 | **4.8** | 39.3 |
| | 3529 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 793 | 635 | **714** | 384 | 435 | **410** | 4.0 | 5.2 | **4.6** | 38.1 |
| | 3530 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1060 | 1131 | **1096** | 664 | 670 | **667** | 4.6 | 5.8 | **5.2** | 38.7 |
| 4F | 4521 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 998 | 1053 | **1026** | 690 | 604 | **647** | 5.1 | 5.3 | **5.2** | 38.8 |
| | 4522 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1031 | 851 | **941** | 723 | 397 | **560** | 3.5 | 5.7 | **4.6** | 39.0 |
| | 4523 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 911 | 965 | **938** | 494 | 404 | **449** | 5.9 | 5.6 | **5.8** | 38.8 |
| | 4524 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1005 | 989 | **997** | 458 | 564 | **511** | 4.2 | 5.1 | **4.7** | 38.8 |
| | 4525 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1056 | 1040 | **1048** | 551 | 530 | **541** | 4.3 | 3.5 | **3.9** | 38.4 |
| | 4526 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 916 | 1062 | **989** | 443 | 729 | **586** | 3.1 | 3.7 | **3.4** | 38.4 |
| | 4527 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 914 | 796 | **855** | 753 | 639 | **696** | 5.7 | 5.6 | **5.7** | 38.7 |
| | 4528 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 813 | 1098 | **956** | 763 | 761 | **762** | 3.9 | 4.6 | **4.3** | 38.5 |
| | 4529 | 3 | 3 | 1 | 1 | 2 | 1 | 1 | 921 | 898 | **910** | 428 | 420 | **424** | 4.2 | 5.7 | **5.0** | 38.5 |
| | 4530 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 994 | 912 | **953** | 639 | 395 | **517** | 7.5 | 4.4 | **6.0** | 38.9 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - week 8

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Home Cage Evaluations | | | | Handling Evaluations | | | | | | Open Field Evaluations | | | | | | | Motor Movements | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group /Sex | Animal Number | Post | Palp Close | Vocal | Motor | Rem | Hand | Chromo | Lac | Sal | Coat | Gait | Loco | Arous | Pilo | Exo | Urine | Feces | Fasc | Trem | Conv |
| 1M | 1021 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1022 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 6 | 0 | 1 | 1 | 1 |
| | 1023 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| | 1024 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1025 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 5 | 0 | 1 | 1 | 1 |
| | 1026 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 6 | 0 | 1 | 1 | 1 |
| | 1027 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| | 1028 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1029 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1030 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 7 | 0 | 1 | 1 | 1 |
| 2M | 2021 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 4 | 2 | 1 | 1 | 1 |
| | 2022 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2023 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2024 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2025 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2026 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 3 | 1 | 1 | 1 |
| | 2027 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2028 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 2 | 0 | 1 | 1 | 1 |
| | 2029 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| | 2030 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 4 | 0 | 1 | 1 | 1 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - week 8

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose (mg/m$^3$) | | 2000 | 10000 | 20000 |

| | | Reflex Assessments | | | | | | | Grip Strength (grams) | | | | | | Landing Foot Splay (centimeters) | | | Body |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Animal | Visual | | Pinna | | | Pupil | Air | Forelimb | | | Hindlimb | | | | | | Temp |
| /Sex | Number | Appr | Aud | Reflex | Proprio | Pain | Resp | Right | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | (°C) |
| 1M | 1021 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | - | 972 | **972** | 860 | 757 | **809** | 4.1 | 4.4 | **4.3** | 38.2 |
| | 1022 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1398 | 1450 | **1424** | 1115 | 984 | **1050** | 5.1 | 6.1 | **5.6** | 39.1 |
| | 1023 | 3 | 3 | 1 | 1 | 2 | 1 | 1 | - | 1071 | **1071** | 604 | 416 | **510** | 4.7 | 4.9 | **4.8** | 37.8 |
| | 1024 | 3 | 3 | 1 | 1 | 2 | 1 | 1 | 1203 | 987 | **1095** | 669 | 674 | **672** | 3.5 | 4.2 | **3.9** | 37.6 |
| | 1025 | 3 | 3 | 1 | 1 | 2 | 1 | 1 | 1249 | 1173 | **1211** | 682 | 661 | **672** | 4.6 | 4.6 | **4.6** | 37.3 |
| | 1026 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1259 | 1185 | **1222** | 775 | 667 | **721** | 4.2 | 4.1 | **4.2** | 39.2 |
| | 1027 | 3 | 3 | 1 | 1 | 2 | 1 | 1 | 1268 | 1215 | **1242** | 679 | 643 | **661** | 4.8 | 5.4 | **5.1** | 38.3 |
| | 1028 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 882 | 1141 | **1012** | 709 | 554 | **632** | 7.2 | 4.3 | **5.8** | 37.1 |
| | 1029 | 3 | 3 | 1 | 1 | 2 | 1 | 1 | 712 | 916 | **814** | 820 | 729 | **775** | 6.6 | 6.9 | **6.8** | 37.5 |
| | 1030 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 971 | 1028 | **1000** | 755 | 488 | **622** | 5.3 | 6.3 | **5.8** | 37.3 |
| 2M | 2021 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 853 | 1418 | **1136** | 784 | 672 | **728** | 3.2 | 4.4 | **3.8** | 38.9 |
| | 2022 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | - | 1185 | **1185** | 677 | 547 | **612** | 4.1 | 5.4 | **4.8** | 38.6 |
| | 2023 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1016 | 1010 | **1013** | 616 | 577 | **597** | 4.7 | 5.4 | **5.1** | 37.3 |
| | 2024 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1042 | 1155 | **1099** | 750 | 707 | **729** | 4.6 | 6.0 | **5.3** | 37.6 |
| | 2025 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1068 | 1110 | **1089** | 646 | 570 | **608** | 5.6 | 6.4 | **6.0** | 37.6 |
| | 2026 | 3 | 3 | 1 | 1 | 2 | 1 | 1 | 1081 | 1061 | **1071** | 698 | 664 | **681** | 7.2 | 7.9 | **7.6** | 37.7 |
| | 2027 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1029 | 1218 | **1124** | 699 | 790 | **745** | 5.7 | 5.6 | **5.7** | 38.2 |
| | 2028 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1446 | 1381 | **1414** | 776 | 803 | **790** | 7.7 | 9.9 | **8.8** | 38.4 |
| | 2029 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1191 | 1215 | **1203** | 558 | 566 | **562** | 5.3 | 5.7 | **5.5** | 37.3 |
| | 2030 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 956 | 820 | **888** | 745 | 641 | **693** | 7.2 | 9.4 | **8.3** | 37.0 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - week 8

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Home Cage Evaluations | | | | Handling Evaluations | | | | | | Open Field Evaluations | | | | | | | Motor Movements | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group /Sex | Animal Number | Post | Palp Close | Vocal | Motor | Rem | Hand | Chromo | Lac | Sal | Coat | Gait | Loco | Arous | Pilo | Exo | Urine | Feces | Fasc | Trem | Conv |
| 3M | 3021 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 8 | 1 | 1 | 1 | 1 |
| | 3022 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3023 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 7 | 0 | 1 | 1 | 1 |
| | 3024 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 5 | 0 | 1 | 1 | 1 |
| | 3025 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 5 | 0 | 1 | 1 | 1 |
| | 3026 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 3 | 0 | 1 | 1 | 1 |
| | 3027 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 3 | 0 | 1 | 1 | 1 |
| | 3028 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3029 | 1 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 6 | 0 | 1 | 1 | 1 |
| | 3030 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 3 | 6 | 1 | 1 | 1 |
| 4M | 4021 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4022 | 3 | 4 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4023 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 3 | 0 | 1 | 1 | 1 |
| | 4024 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 3 | 0 | 1 | 1 | 1 |
| | 4025 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4026 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4027 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4028 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 5 | 0 | 1 | 1 | 1 |
| | 4029 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4030 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 4 | 0 | 1 | 1 | 1 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - week 8

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Reflex Assessments | | | | | | | Grip Strength (grams) | | | | | | Landing Foot Splay (centimeters) | | | Body |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Animal | Visual | | Pinna | | | Pupil | Air | Forelimb | | | Hindlimb | | | | | | Temp |
| /Sex | Number | Appr | Aud | Reflex | Proprio | Pain | Resp | Right | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | (°C) |
| 3M | 3021 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1073 | 1281 | **1177** | 722 | 623 | **673** | 4.3 | 5.6 | **5.0** | 38.6 |
| | 3022 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1260 | 1457 | **1359** | 562 | 538 | **550** | 5.3 | 5.6 | **5.5** | 37.5 |
| | 3023 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1231 | 1370 | **1301** | 776 | 943 | **860** | 5.6 | 6.3 | **6.0** | 37.7 |
| | 3024 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1084 | 927 | **1006** | 943 | 770 | **857** | 5.6 | 6.6 | **6.1** | 38.1 |
| | 3025 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1231 | 668 | **950** | 534 | 423 | **479** | 5.1 | 7.6 | **6.4** | 37.8 |
| | 3026 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1226 | 1252 | **1239** | 884 | 601 | **743** | 4.1 | 4.6 | **4.4** | 37.9 |
| | 3027 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 771 | 1092 | **932** | 342 | 552 | **447** | 3.1 | 4.0 | **3.6** | 39.1 |
| | 3028 | 3 | 3 | 1 | 1 | 2 | 1 | 1 | 1129 | 883 | **1006** | 508 | 712 | **610** | 6.3 | 6.9 | **6.6** | 37.1 |
| | 3029 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 766 | 851 | **809** | 483 | 538 | **511** | 3.8 | 4.2 | **4.0** | 37.3 |
| | 3030 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 801 | 751 | **776** | 740 | 780 | **760** | 3.3 | 3.8 | **3.6** | 38.1 |
| 4M | 4021 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1346 | 1293 | **1320** | 770 | 732 | **751** | 4.6 | 5.4 | **5.0** | 38.7 |
| | 4022 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1151 | 798 | **975** | 680 | 662 | **671** | 6.6 | 5.3 | **6.0** | 38.8 |
| | 4023 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1136 | 1048 | **1092** | 717 | 557 | **637** | 5.0 | 5.9 | **5.5** | 38.2 |
| | 4024 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1123 | 1122 | **1123** | 553 | 751 | **652** | 4.7 | 4.1 | **4.4** | 37.2 |
| | 4025 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 591 | 1078 | **835** | 600 | 693 | **647** | 4.5 | 5.7 | **5.1** | 37.4 |
| | 4026 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1103 | 1315 | **1209** | 958 | 996 | **977** | 4.4 | 6.1 | **5.3** | 38.4 |
| | 4027 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1274 | 1383 | **1329** | 677 | 731 | **704** | 6.6 | 8.1 | **7.4** | 38.2 |
| | 4028 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1075 | 1209 | **1142** | 715 | 565 | **640** | 5.1 | 5.8 | **5.5** | 38.8 |
| | 4029 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1146 | 1065 | **1106** | 596 | 631 | **614** | 6.6 | 6.2 | **6.4** | 36.9 |
| | 4030 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1068 | 1076 | **1072** | 834 | 677 | **756** | 5.6 | 7.0 | **6.3** | 37.0 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - week 8

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Home Cage Evaluations | | | | Handling Evaluations | | | | | | Open Field Evaluations | | | | | | | Motor Movements | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group /Sex | Animal Number | Post | Palp Close | Vocal | Motor | Rem | Hand | Chromo | Lac | Sal | Coat | Gait | Loco | Arous | Pilo | Exo | Urine | Feces | Fasc | Trem | Conv |
| 1F | 1521 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1522 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1523 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1524 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1525 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1526 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1527 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1528 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7.1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1529 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1530 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| 2F | 2521 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2522 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2523 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2524 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2525 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2526 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2527 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2528 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2529 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2530 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - week 8

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Reflex Assessments | | | | | | | Grip Strength (grams) | | | | | | Landing Foot Splay (centimeters) | | | Body |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Animal | Visual | | Pinna | | | Pupil | Air | Forelimb | | | Hindlimb | | | | | | Temp |
| /Sex | Number | Appr | Aud | Reflex | Proprio | Pain | Resp | Right | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | (°C) |
| 1F | 1521 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 906 | 1138 | **1022** | 759 | 682 | **721** | 4.6 | 6.8 | **5.7** | 38.6 |
| | 1522 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 968 | 946 | **957** | 619 | 714 | **667** | 3.2 | 4.0 | **3.6** | 38.4 |
| | 1523 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 501 | 1178 | **840** | 336 | 518 | **427** | 3.2 | 3.4 | **3.3** | 38.5 |
| | 1524 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1106 | 1137 | **1122** | 628 | 586 | **607** | 4.8 | 5.0 | **4.9** | 37.6 |
| | 1525 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 938 | 997 | **968** | 806 | 692 | **749** | 3.1 | 3.6 | **3.4** | 39.2 |
| | 1526 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 953 | 1054 | **1004** | 879 | 783 | **831** | 3.0 | 4.2 | **3.6** | 38.8 |
| | 1527 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1033 | 981 | **1007** | 236 | 467 | **352** | 4.1 | 4.2 | **4.2** | 38.9 |
| | 1528 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1076 | 1093 | **1085** | 568 | 677 | **623** | 4.2 | 5.6 | **4.9** | 38.2 |
| | 1529 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 901 | 1066 | **984** | 604 | 606 | **605** | 5.1 | 4.1 | **4.6** | 37.5 |
| | 1530 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 901 | 835 | **868** | 649 | 648 | **649** | 4.5 | 4.8 | **4.7** | 38.0 |
| 2F | 2521 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1070 | 1385 | **1228** | 490 | 640 | **565** | 5.6 | 6.7 | **6.2** | 39.3 |
| | 2522 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 488 | 641 | **565** | 566 | 504 | **535** | 5.5 | 6.3 | **5.9** | 38.7 |
| | 2523 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 884 | 1054 | **969** | 619 | 594 | **607** | 7.1 | 8.0 | **7.6** | 38.7 |
| | 2524 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 989 | 979 | **984** | 649 | 613 | **631** | 4.6 | 7.1 | **5.9** | 37.1 |
| | 2525 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 876 | 1033 | **955** | 704 | 527 | **616** | 3.0 | 2.6 | **2.8** | 38.6 |
| | 2526 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 925 | 1149 | **1037** | 437 | 565 | **501** | 4.9 | 5.3 | **5.1** | 38.5 |
| | 2527 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1127 | 1299 | **1213** | 576 | 643 | **610** | 5.7 | 5.6 | **5.7** | 39.0 |
| | 2528 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 904 | 1061 | **983** | 498 | 546 | **522** | 3.6 | 4.7 | **4.2** | 37.2 |
| | 2529 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 814 | 831 | **823** | 716 | 561 | **639** | 4.5 | 5.4 | **5.0** | 38.2 |
| | 2530 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 882 | 897 | **890** | 663 | 415 | **539** | 2.8 | 3.8 | **3.3** | 37.5 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - week 8

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Home Cage Evaluations | | | | Handling Evaluations | | | | | | Open Field Evaluations | | | | | | | Motor Movements | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group /Sex | Animal Number | Post | Palp Close | Vocal | Motor | Rem | Hand | Chromo | Lac | Sal | Coat | Gait | Loco | Arous | Pilo | Exo | Urine | Feces | Fasc | Trem | Conv |
| 3F | 3521 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3522 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3523 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3524 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3525 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3526 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3527 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3528 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3529 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3530 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| 4F | 4521 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4522 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4523 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4524 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4525 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4526 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4527 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4528 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4529 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4530 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - week 8

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Reflex Assessments | | | | | | | Grip Strength (grams) | | | | | | Landing Foot Splay (centimeters) | | | Body |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Animal | Visual | | Pinna | | | Pupil | Air | Forelimb | | | Hindlimb | | | | | | Temp |
| /Sex | Number | Appr | Aud | Reflex | Proprio | Pain | Resp | Right | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | (°C) |
| 3F | 3521 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 778 | 873 | **826** | 787 | 829 | **808** | 5.1 | 6.5 | **5.8** | 38.3 |
| | 3522 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | - | 1040 | **1040** | 399 | 527 | **463** | 4.6 | 5.6 | **5.1** | 38.4 |
| | 3523 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1153 | 945 | **1049** | 312 | 260 | **286** | 5.6 | 6.3 | **6.0** | 37.6 |
| | 3524 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1189 | 1484 | **1337** | 774 | 687 | **731** | 4.6 | 6.3 | **5.5** | 38.4 |
| | 3525 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 910 | 922 | **916** | 475 | 626 | **551** | 3.7 | 3.6 | **3.7** | 38.6 |
| | 3526 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1172 | 1304 | **1238** | 646 | 735 | **691** | 3.6 | 3.3 | **3.5** | 39.2 |
| | 3527 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 948 | 733 | **841** | 449 | 457 | **453** | 3.7 | 4.6 | **4.2** | 38.7 |
| | 3528 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1246 | 1174 | **1210** | 575 | 768 | **672** | 4.1 | 5.2 | **4.7** | 38.6 |
| | 3529 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 655 | 529 | **592** | 327 | 404 | **366** | 4.2 | 3.7 | **4.0** | 37.8 |
| | 3530 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1029 | 1061 | **1045** | 699 | 594 | **647** | 4.2 | 4.6 | **4.4** | 38.1 |
| 4F | 4521 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1051 | 814 | **933** | 568 | 559 | **564** | 6.1 | 5.7 | **5.9** | 39.3 |
| | 4522 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 861 | 978 | **920** | 459 | 583 | **521** | 4.7 | 4.5 | **4.6** | 38.4 |
| | 4523 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 959 | 1015 | **987** | 594 | 595 | **595** | 3.6 | 5.6 | **4.6** | 38.4 |
| | 4524 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 876 | 970 | **923** | 528 | 434 | **481** | 4.6 | 4.6 | **4.6** | 37.8 |
| | 4525 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1118 | 1395 | **1257** | 559 | 349 | **454** | 3.1 | 3.8 | **3.5** | 38.3 |
| | 4526 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1158 | 1618 | **1388** | 349 | 533 | **441** | 3.1 | 4.5 | **3.8** | 39.0 |
| | 4527 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 714 | 635 | **675** | 756 | 608 | **682** | 7.5 | 6.2 | **6.9** | 37.3 |
| | 4528 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 981 | 1006 | **994** | 599 | 709 | **654** | 4.3 | 5.9 | **5.1** | 38.6 |
| | 4529 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 592 | 1087 | **840** | 473 | 592 | **533** | 4.1 | 5.3 | **4.7** | 38.3 |
| | 4530 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1177 | 916 | **1047** | 300 | 505 | **403** | 4.6 | 7.1 | **5.9** | 38.9 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - week 13

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Home Cage Evaluations | | | | Handling Evaluations | | | | | | Open Field Evaluations | | | | | | | Motor Movements | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group /Sex | Animal Number | Post | Palp Close | Vocal | Motor | Rem | Hand | Chromo | Lac | Sal | Coat | Gait | Loco | Arous | Pilo | Exo | Urine | Feces | Fasc | Trem | Conv |
| 1M | 1021 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1022 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 2 | 0 | 1 | 1 | 1 |
| | 1023 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 5 | 0 | 1 | 1 | 1 |
| | 1024 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1025 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 7 | 0 | 1 | 1 | 1 |
| | 1026 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1027 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 0 | 2 | 1 | 1 | 1 |
| | 1028 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1029 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1030 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 7 | 0 | 1 | 1 | 1 |
| 2M | 2021 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 3 | 5 | 1 | 1 | 1 |
| | 2022 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 2 | 0 | 1 | 1 | 1 |
| | 2023 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2024 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| | 2025 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2026 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 2 | 5 | 1 | 1 | 1 |
| | 2027 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| | 2028 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 2 | 1 | 1 | 1 |
| | 2029 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 5 | 0 | 1 | 1 | 1 |
| | 2030 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 5 | 1 | 1 | 1 | 1 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - week 13

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose (mg/m$^3$) | | 2000 | 10000 | 20000 |

| | | Reflex Assessments | | | | | | | Grip Strength (grams) | | | | | | Landing Foot Splay (centimeters) | | | Body |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Animal | Visual | | Pinna | | | Pupil | Air | Forelimb | | | Hindlimb | | | | | | Temp |
| /Sex | Number | Appr | Aud | Reflex | Proprio | Pain | Resp | Right | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | (°C) |
| 1M | 1021 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 908 | 951 | **930** | 750 | 749 | **750** | 3.6 | 5.5 | **4.6** | 37.2 |
| | 1022 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1399 | 1557 | **1478** | 1169 | 783 | **976** | 3.5 | 5.1 | **4.3** | 38.1 |
| | 1023 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1045 | 805 | **925** | 815 | 768 | **792** | 3.1 | 3.9 | **3.5** | 36.3 |
| | 1024 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1207 | 1397 | **1302** | 716 | 814 | **765** | 3.6 | 4.7 | **4.2** | 37.3 |
| | 1025 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1192 | 1354 | **1273** | 785 | 735 | **760** | 4.1 | 4.3 | **4.2** | 37.6 |
| | 1026 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1283 | 1310 | **1297** | 730 | 693 | **712** | 4.0 | 4.2 | **4.1** | 37.6 |
| | 1027 | 3 | 3 | 1 | 1 | 2 | 1 | 1 | 1237 | 1477 | **1357** | 608 | 725 | **667** | 5.0 | 4.9 | **5.0** | 37.3 |
| | 1028 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 854 | 793 | **824** | 743 | 725 | **734** | 4.6 | 5.8 | **5.2** | 37.0 |
| | 1029 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1045 | 984 | **1015** | 1000 | 873 | **937** | 4.7 | 6.8 | **5.8** | 37.0 |
| | 1030 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 981 | 1022 | **1002** | 708 | 652 | **680** | 5.3 | 4.9 | **5.1** | 37.2 |
| 2M | 2021 | 3 | 3 | 1 | 1 | 2 | 1 | 1 | 1285 | 1331 | **1308** | 949 | 639 | **794** | 3.9 | 4.4 | **4.2** | 38.4 |
| | 2022 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1096 | 1222 | **1159** | 748 | 660 | **704** | 3.2 | 4.5 | **3.9** | 37.4 |
| | 2023 | 3 | 3 | 1 | 1 | 2 | 1 | 1 | 996 | 1170 | **1083** | 524 | 521 | **523** | 5.6 | 6.4 | **6.0** | 37.4 |
| | 2024 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1046 | 1242 | **1144** | 772 | 756 | **764** | 2.7 | 4.6 | **3.7** | 37.6 |
| | 2025 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1419 | 1370 | **1395** | 1018 | 752 | **885** | 6.5 | 5.7 | **6.1** | 38.4 |
| | 2026 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1327 | 1322 | **1325** | 894 | 795 | **845** | 5.9 | 6.0 | **6.0** | 37.3 |
| | 2027 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1265 | 1432 | **1349** | 614 | 891 | **753** | 5.1 | 5.4 | **5.3** | 36.8 |
| | 2028 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1304 | 1505 | **1405** | 727 | 1064 | **896** | 6.4 | 7.6 | **7.0** | 37.5 |
| | 2029 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1377 | 1570 | **1474** | 918 | 1230 | **1074** | 4.1 | 5.9 | **5.0** | 38.7 |
| | 2030 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1307 | 1377 | **1342** | 839 | 1216 | **1028** | 7.2 | 9.5 | **8.4** | 38.2 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - week 13

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Home Cage Evaluations | | | | Handling Evaluations | | | | | | Open Field Evaluations | | | | | | | Motor Movements | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group /Sex | Animal Number | Post | Palp Close | Vocal | Motor | Rem | Hand | Chromo | Lac | Sal | Coat | Gait | Loco | Arous | Pilo | Exo | Urine | Feces | Fasc | Trem | Conv |
| 3M | 3021 | 3 | 4 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 4 | 0 | 1 | 1 | 1 |
| | 3022 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3023 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3024 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 6 | 0 | 1 | 1 | 1 |
| | 3025 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 4 | 4 | 1 | 1 | 1 |
| | 3026 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 2 | 0 | 1 | 1 | 1 |
| | 3027 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| | 3028 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3029 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 2 | 0 | 1 | 1 | 1 |
| | 3030 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 2 | 0 | 1 | 1 | 1 |
| 4M | 4021 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4022 | 3 | 4 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 5 | 0 | 1 | 1 | 1 |
| | 4023 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 2 | 0 | 1 | 1 | 1 |
| | 4024 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 6 | 0 | 1 | 1 | 1 |
| | 4025 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4026 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4027 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4028 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 3 | 0 | 1 | 1 | 1 |
| | 4029 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 3 | 0 | 1 | 1 | 1 |
| | 4030 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 3 | 0 | 1 | 1 | 1 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - week 13

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Reflex Assessments | | | | | | | Grip Strength (grams) | | | | | | Landing Foot Splay (centimeters) | | | Body |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Animal | Visual | | Pinna | | | Pupil | Air | Forelimb | | | Hindlimb | | | | | | Temp |
| /Sex | Number | Appr | Aud | Reflex | Proprio | Pain | Resp | Right | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | (°C) |
| 3M | 3021 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1286 | 1433 | **1360** | 756 | 719 | **738** | 6.5 | 6.2 | **6.4** | 37.3 |
| | 3022 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1104 | 1526 | **1315** | 656 | 751 | **704** | 3.6 | 5.8 | **4.7** | 37.6 |
| | 3023 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1489 | 1682 | **1586** | 821 | 1180 | **1001** | 5.1 | 6.2 | **5.7** | 37.4 |
| | 3024 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1108 | 786 | **947** | 792 | 604 | **698** | 7.8 | 7.6 | **7.7** | 37.7 |
| | 3025 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1181 | 1126 | **1154** | 625 | 682 | **654** | 6.1 | 5.7 | **5.9** | 37.2 |
| | 3026 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1290 | 1134 | **1212** | 787 | 864 | **826** | 4.6 | 4.9 | **4.8** | 38.3 |
| | 3027 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 948 | 1137 | **1043** | 699 | 591 | **645** | 3.6 | 3.1 | **3.4** | 37.2 |
| | 3028 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1071 | 1036 | **1054** | 692 | 673 | **683** | 4.7 | 6.0 | **5.4** | 37.7 |
| | 3029 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 933 | 1158 | **1046** | 630 | 525 | **578** | 3.1 | 3.6 | **3.4** | 38.3 |
| | 3030 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 962 | 1180 | **1071** | 932 | 1050 | **991** | 4.0 | 5.4 | **4.7** | 37.7 |
| 4M | 4021 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1209 | 1463 | **1336** | 1066 | 540 | **803** | 5.3 | 4.9 | **5.1** | 36.9 |
| | 4022 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1149 | 1140 | **1145** | 662 | 677 | **670** | 4.0 | 4.3 | **4.2** | 37.8 |
| | 4023 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1316 | 1331 | **1324** | 707 | 464 | **586** | 6.7 | 8.3 | **7.5** | 38.2 |
| | 4024 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1141 | 1283 | **1212** | 656 | 848 | **752** | 4.5 | 4.1 | **4.3** | 37.6 |
| | 4025 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 984 | 957 | **971** | 602 | 623 | **613** | 5.5 | 6.6 | **6.1** | 37.1 |
| | 4026 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1290 | 1475 | **1383** | 1104 | 986 | **1045** | 4.0 | 6.1 | **5.1** | 37.9 |
| | 4027 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1748 | 1302 | **1525** | 1338 | 1083 | **1211** | 4.9 | 8.2 | **6.6** | 38.5 |
| | 4028 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1141 | 1360 | **1251** | 960 | 985 | **973** | 4.2 | 5.5 | **4.9** | 38.6 |
| | 4029 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1174 | 1146 | **1160** | 935 | 658 | **797** | 4.7 | 5.3 | **5.0** | 37.6 |
| | 4030 | 3 | 3 | 1 | 1 | 2 | 1 | 1 | 1422 | 1207 | **1315** | 1100 | 1010 | **1055** | 5.3 | 3.9 | **4.6** | 38.0 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - week 13

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Home Cage Evaluations | | | | Handling Evaluations | | | | | | | Open Field Evaluations | | | | | | Motor Movements | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group /Sex | Animal Number | Post | Palp Close | Vocal | Motor | Rem | Hand | Chromo | Lac | Sal | Coat | Gait | Loco | Arous | Pilo | Exo | Urine | Feces | Fasc | Trem | Conv |
| 1F | 1521 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1522 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1523 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1524 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 2 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1525 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1526 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1527 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1528 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7.1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1529 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 1530 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 2 | 1 | 0 | 0 | 1 | 1 | 1 |
| 2F | 2521 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2522 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| | 2523 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2524 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2525 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2526 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2527 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2528 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2529 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 2530 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 2 | 1 | 0 | 0 | 1 | 1 | 1 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - week 13

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Reflex Assessments | | | | | | | Grip Strength (grams) | | | | | | Landing Foot Splay (centimeters) | | | Body |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Animal | Visual | | Pinna | | | Pupil | Air | Forelimb | | | Hindlimb | | | | | | Temp |
| /Sex | Number | Appr | Aud | Reflex | Proprio | Pain | Resp | Right | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | (°C) |
| 1F | 1521 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 952 | 940 | **946** | 689 | 604 | **647** | 5.1 | 5.7 | **5.4** | 37.7 |
| | 1522 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1257 | 1239 | **1248** | 579 | 520 | **550** | 5.2 | 5.7 | **5.5** | 37.8 |
| | 1523 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1163 | 1162 | **1163** | 644 | 663 | **654** | 3.6 | 4.7 | **4.2** | 38.1 |
| | 1524 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1033 | 1220 | **1127** | 696 | 813 | **755** | 3.8 | 5.5 | **4.7** | 37.3 |
| | 1525 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 929 | 1055 | **992** | 670 | 685 | **678** | 3.7 | 3.9 | **3.8** | 38.7 |
| | 1526 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 843 | 908 | **876** | 625 | 793 | **709** | 3.9 | 3.4 | **3.7** | 38.4 |
| | 1527 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1205 | 1238 | **1222** | 400 | 577 | **489** | 4.1 | 4.2 | **4.2** | 37.3 |
| | 1528 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 896 | 1074 | **985** | 585 | 564 | **575** | 4.1 | 5.2 | **4.7** | 37.3 |
| | 1529 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 943 | 1041 | **992** | 814 | 951 | **883** | 4.6 | 4.9 | **4.8** | 37.1 |
| | 1530 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1036 | 992 | **1014** | 915 | 618 | **767** | 4.0 | 5.5 | **4.8** | 37.4 |
| 2F | 2521 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1169 | 1451 | **1310** | 775 | 495 | **635** | 5.5 | 5.9 | **5.7** | 38.9 |
| | 2522 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 378 | 537 | **458** | 474 | 425 | **450** | 4.4 | 5.1 | **4.8** | 38.2 |
| | 2523 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 886 | 1083 | **985** | 605 | 723 | **664** | 6.7 | 8.1 | **7.4** | 37.4 |
| | 2524 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 506 | 964 | **735** | 557 | 441 | **499** | 7.1 | 7.7 | **7.4** | 37.0 |
| | 2525 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1153 | 1143 | **1148** | 600 | 654 | **627** | 3.9 | 3.9 | **3.9** | 37.6 |
| | 2526 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1107 | 1116 | **1112** | 649 | 533 | **591** | 5.1 | 6.4 | **5.8** | 38.0 |
| | 2527 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 835 | 982 | **909** | 707 | 957 | **832** | 4.9 | 4.9 | **4.9** | 37.6 |
| | 2528 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1138 | 1156 | **1147** | 638 | 599 | **619** | 3.2 | 4.4 | **3.8** | 37.6 |
| | 2529 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 777 | 889 | **833** | 637 | 901 | **769** | 4.3 | 5.7 | **5.0** | 38.3 |
| | 2530 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 965 | 927 | **946** | 478 | 688 | **583** | 2.7 | 3.1 | **2.9** | 37.4 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - week 13

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Home Cage Evaluations | | | | Handling Evaluations | | | | | | | Open Field Evaluations | | | | | | Motor Movements | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group /Sex | Animal Number | Post | Palp Close | Vocal | Motor | Rem | Hand | Chromo | Lac | Sal | Coat | Gait | Loco | Arous | Pilo | Exo | Urine | Feces | Fasc | Trem | Conv |
| 3F | 3521 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 3 | 0 | 1 | 1 | 1 |
| | 3522 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3523 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3524 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3525 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 2 | 4 | 1 | 1 | 1 |
| | 3526 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 8 | 0 | 1 | 1 | 1 |
| | 3527 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3528 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3529 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 3530 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| 4F | 4521 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 2 | 0 | 1 | 1 | 1 |
| | 4522 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 2 | 0 | 1 | 1 | 1 |
| | 4523 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4524 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4525 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4526 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4527 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| | 4528 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4529 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| | 4530 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |

APPENDIX 9 (cont) Functional observational battery - individual assessments - week 13

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| | | Reflex Assessments | | | | | | | Grip Strength (grams) | | | | | | Landing Foot Splay | | | Body |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Animal | Visual | | Pinna | | | Pupil | Air | Forelimb | | | Hindlimb | | | (centimeters) | | | Temp |
| /Sex | Number | Appr | Aud | Reflex | Proprio | Pain | Resp | Right | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | Trial 1 | Trial 2 | **Mean** | (°C) |
| 3F | 3521 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 931 | 986 | **959** | 419 | 592 | **506** | 5.1 | 7.9 | **6.5** | 38.2 |
| | 3522 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1346 | 1283 | **1315** | 612 | 574 | **593** | 7.1 | 4.2 | **5.7** | 37.2 |
| | 3523 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 747 | 938 | **843** | 446 | 673 | **560** | 4.9 | 6.6 | **5.8** | 38.9 |
| | 3524 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1459 | 1347 | **1403** | 781 | 542 | **662** | 5.1 | 6.2 | **5.7** | 38.1 |
| | 3525 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1070 | 1034 | **1052** | 663 | 718 | **691** | 3.6 | 5.6 | **4.6** | 38.2 |
| | 3526 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1431 | 1325 | **1378** | 901 | 860 | **881** | 3.6 | 5.9 | **4.8** | 39.4 |
| | 3527 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 993 | 1003 | **998** | 702 | 422 | **562** | 4.1 | 4.2 | **4.2** | 37.5 |
| | 3528 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1272 | 1258 | **1265** | 650 | 626 | **638** | 3.7 | 4.4 | **4.1** | 38.2 |
| | 3529 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 804 | 988 | **896** | 325 | 506 | **416** | 5.6 | 4.0 | **4.8** | 37.6 |
| | 3530 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1246 | 1138 | **1192** | 782 | 490 | **636** | 4.8 | 5.7 | **5.3** | 38.3 |
| 4F | 4521 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 861 | 1122 | **992** | 544 | 727 | **636** | 4.6 | 5.4 | **5.0** | 38.5 |
| | 4522 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1215 | 1187 | **1201** | 833 | 396 | **615** | 4.1 | 5.7 | **4.9** | 37.2 |
| | 4523 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 931 | 842 | **887** | 668 | 675 | **672** | 5.1 | 5.5 | **5.3** | 38.1 |
| | 4524 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 751 | 645 | **698** | 549 | 530 | **540** | 3.9 | 5.4 | **4.7** | 38.2 |
| | 4525 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 978 | 1358 | **1168** | 547 | 490 | **519** | 7.0 | 5.3 | **6.2** | 37.4 |
| | 4526 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1183 | 1155 | **1169** | 533 | 716 | **625** | 5.3 | 5.1 | **5.2** | 38.1 |
| | 4527 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 649 | 1169 | **909** | 761 | 893 | **827** | 6.1 | 6.8 | **6.5** | 37.9 |
| | 4528 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 848 | 833 | **841** | 751 | 699 | **725** | 4.2 | 5.0 | **4.6** | 37.9 |
| | 4529 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1055 | 1137 | **1096** | 715 | 623 | **669** | 4.0 | 5.2 | **4.6** | 38.4 |
| | 4530 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1086 | 1110 | **1098** | 655 | 404 | **530** | 4.3 | 4.6 | **4.5** | 39.0 |

APPENDIX 10 Hematology - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | HGB g/dL | HCT % | RBC x10^6/uL | RETIC x10^9/L | PLT x10^3/uL | MCV fL | MCH pg | MCHC g/dL | RDW % | WBC x10^3/uL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | 1001 | Week 5 | 16.2 | 49.6 | 7.94 | 299.4 | 817 | 62.5 | 20.4 | 32.6 | 12.7 | 12.52 |
| | | Termination | 14.6 | 45.1 | 7.82 | 302.6 | 835 | 57.6 | 18.7 | 32.5 | 14.4 | 12.17 |
| | 1002 | Week 5 | 16.0 | 48.8 | 7.93 | 286.4 | 1055 | 61.6 | 20.2 | 32.8 | 12.2 | 8.82 |
| | | Termination | 14.3 | 42.2 | 7.57 | 285.5 | 951 | 55.8 | 18.8 | 33.8 | 15.9 | 7.70 |
| | 1003 | Week 5 | 16.1 | 50.3 | 8.45 | 221.4 | 988 | 59.5 | 19.1 | 32.1 | 11.8 | 9.88 |
| | | Termination | 14.8 | 45.7 | 8.45 | 190.1 | 951 | 54.1 | 17.5 | 32.3 | 12.9 | 6.98 |
| | 1004 | Week 5 | 17.4 | 53.2 | 8.87 | 195.8 | 856 | 60.0 | 19.6 | 32.7 | 11.0 | 11.86 |
| | | Termination | 16.2 | 49.5 | 8.93 | 178.0 | 761 | 55.4 | 18.1 | 32.7 | 12.2 | 8.24 |
| | 1005 | Week 5 | 16.4 | 50.1 | 8.26 | 267.2 | 704 | 60.7 | 19.8 | 32.7 | 12.7 | 8.07 |
| | | Termination | 15.0 | 45.9 | 8.23 | 276.4 | 962 | 55.8 | 18.2 | 32.7 | 15.1 | 10.17 |
| | 1006 | Week 5 | 15.6 | 48.5 | 8.23 | 222.0 | 1235 | 58.8 | 18.9 | 32.2 | 11.6 | 13.11 |
| | | Termination | 14.7 | 45.8 | 8.40 | 182.8 | 1240 | 54.5 | 17.5 | 32.1 | 13.2 | 12.68 |
| | 1007 | Week 5 | 16.4 | 51.0 | 8.24 | 211.3 | 1039 | 61.8 | 19.9 | 32.1 | 11.2 | 13.34 |
| | | Termination | 14.6 | 46.9 | 8.16 | 192.0 | 981 | 57.5 | 17.9 | 31.2 | 13.7 | 16.02 |
| | 1008 | Week 5 | 16.9 | 51.6 | 8.40 | 270.6 | 978 | 61.5 | 20.1 | 32.7 | 11.9 | 13.65 |
| | | Termination | 15.1 | 46.3 | 8.43 | 183.4 | 1100 | 54.9 | 18.0 | 32.7 | 14.1 | 15.23 |

APPENDIX 10 (cont) Hematology - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | ANEU x10^3/uL | ALYM x10^3/uL | AMONO x10^3/uL | AEOS x10^3/uL | ABASO x10^3/uL | ALUC x10^3/uL | SCM1 |
|---|---|---|---|---|---|---|---|---|---|
| 1M | 1001 | Week 5 | 1.80 | 10.30 | 0.15 | 0.14 | 0.03 | 0.10 | |
| | | Termination | 2.04 | 9.50 | 0.26 | 0.23 | 0.02 | 0.12 | |
| | 1002 | Week 5 | 1.18 | 7.13 | 0.26 | 0.15 | 0.03 | 0.08 | |
| | | Termination | 1.15 | 6.08 | 0.20 | 0.21 | 0.01 | 0.03 | |
| | 1003 | Week 5 | 0.92 | 8.50 | 0.23 | 0.07 | 0.02 | 0.13 | |
| | | Termination | 0.74 | 5.89 | 0.16 | 0.15 | 0.01 | 0.03 | |
| | 1004 | Week 5 | 1.45 | 9.93 | 0.21 | 0.10 | 0.04 | 0.14 | |
| | | Termination | 1.74 | 6.16 | 0.19 | 0.10 | 0.01 | 0.03 | CLSL |
| | 1005 | Week 5 | 1.33 | 6.15 | 0.21 | 0.25 | 0.04 | 0.10 | CLSE |
| | | Termination | 1.28 | 8.45 | 0.24 | 0.11 | 0.02 | 0.07 | |
| | 1006 | Week 5 | 1.54 | 11.02 | 0.18 | 0.13 | 0.03 | 0.22 | |
| | | Termination | 1.32 | 10.86 | 0.18 | 0.18 | 0.03 | 0.11 | |
| | 1007 | Week 5 | 1.05 | 11.83 | 0.23 | 0.07 | 0.05 | 0.11 | |
| | | Termination | 1.11 | 14.13 | 0.41 | 0.14 | 0.05 | 0.18 | |
| | 1008 | Week 5 | 1.31 | 11.89 | 0.19 | 0.08 | 0.05 | 0.13 | |
| | | Termination | 1.22 | 13.53 | 0.25 | 0.11 | 0.04 | 0.08 | |

APPENDIX 10 (cont) Hematology - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | HGB g/dL | HCT % | RBC x10^6/uL | RETIC x10^9/L | PLT x10^3/uL | MCV fL | MCH pg | MCHC g/dL | RDW % | WBC x10^3/uL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | 1009 | Week 5 | 16.6 | 50.8 | 8.31 | 231.7 | 758 | 61.1 | 19.9 | 32.6 | 11.5 | 11.39 |
| | | Termination | 15.8 | 48.8 | 8.71 | 229.2 | 798 | 56.0 | 18.2 | 32.5 | 14.0 | 14.04 |
| | 1010 | Week 5 | 16.8 | 51.3 | 8.42 | 236.1 | 1032 | 61.0 | 20.0 | 32.8 | 11.2 | 10.49 |
| | | Termination | 14.9 | 44.5 | 7.86 | 197.9 | 997 | 56.7 | 19.0 | 33.6 | 12.4 | 9.44 |
| 2M | 2001 | Week 5 | 17.3 | 54.2 | 8.70 | 268.3 | 469 | 62.3 | 19.9 | 31.9 | 11.3 | 10.02 |
| | | Termination | 14.9 | 46.2 | 8.13 | 228.9 | 915 | 56.8 | 18.3 | 32.1 | 13.3 | 11.15 |
| | 2002 | Week 5 | 17.4 | 53.9 | 8.84 | 208.4 | 939 | 61.0 | 19.7 | 32.3 | 11.3 | 12.21 |
| | | Termination | CS | CS | CS | CS | CS | CS | CS | CS | CS | CS |
| | 2003 | Week 5 | 15.9 | 49.1 | 8.36 | 164.7 | 966 | 58.7 | 19.0 | 32.4 | 11.8 | 12.07 |
| | | Termination | 14.2 | 44.2 | 8.16 | 191.8 | 1029 | 54.1 | 17.4 | 32.1 | 14.2 | 12.93 |
| | 2004 | Week 5 | 17.3 | 53.8 | 9.43 | 184.8 | 938 | 57.0 | 18.3 | 32.2 | 11.4 | 9.61 |
| | | Termination | 16.4 | 50.6 | 9.60 | 162.7 | 867 | 52.7 | 17.1 | 32.5 | 13.3 | 9.87 |
| | 2005 | Week 5 | 16.4 | 50.0 | 8.26 | 181.9 | 762 | 60.5 | 19.8 | 32.8 | 11.1 | 10.95 |
| | | Termination | 14.7 | 46.7 | 8.69 | 229.2 | 1078 | 53.7 | 16.9 | 31.5 | 13.2 | 13.00 |
| | 2006 | Week 5 | 16.4 | 49.2 | 7.88 | 183.3 | 1007 | 62.5 | 20.9 | 33.4 | 11.1 | 10.34 |
| | | Termination | 14.5 | 42.9 | 7.71 | 198.9 | 997 | 55.7 | 18.8 | 33.8 | 13.4 | 8.68 |

APPENDIX 10 (cont) Hematology - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | ANEU x10^3/uL | ALYM x10^3/uL | AMONO x10^3/uL | AEOS x10^3/uL | ABASO x10^3/uL | ALUC x10^3/uL | SCM1 |
|---|---|---|---|---|---|---|---|---|---|
| 1M | 1009 | Week 5 | 0.90 | 9.96 | 0.30 | 0.07 | 0.04 | 0.12 | NCLP |
| | | Termination | 1.02 | 12.31 | 0.42 | 0.16 | 0.04 | 0.09 | CLSL |
| | 1010 | Week 5 | 1.03 | 9.05 | 0.16 | 0.11 | 0.03 | 0.12 | |
| | | Termination | 1.35 | 7.53 | 0.28 | 0.19 | 0.01 | 0.07 | |
| 2M | 2001 | Week 5 | 1.05 | 8.05 | 0.24 | 0.52 | 0.04 | 0.12 | CLSE |
| | | Termination | 0.88 | 9.47 | 0.49 | 0.08 | 0.02 | 0.21 | |
| | 2002 | Week 5 | 0.79 | 10.99 | 0.25 | 0.05 | 0.05 | 0.08 | |
| | | Termination | CS | CS | CS | CS | CS | CS | |
| | 2003 | Week 5 | 1.40 | 10.20 | 0.20 | 0.05 | 0.03 | 0.18 | |
| | | Termination | 1.32 | 10.93 | 0.38 | 0.08 | 0.03 | 0.20 | |
| | 2004 | Week 5 | 0.94 | 8.31 | 0.20 | 0.04 | 0.01 | 0.11 | |
| | | Termination | 1.28 | 8.09 | 0.29 | 0.09 | 0.02 | 0.09 | |
| | 2005 | Week 5 | 2.18 | 8.29 | 0.24 | 0.13 | 0.03 | 0.08 | NCLP |
| | | Termination | 1.57 | 10.45 | 0.51 | 0.18 | 0.03 | 0.26 | |
| | 2006 | Week 5 | 0.95 | 8.97 | 0.23 | 0.05 | 0.03 | 0.11 | |
| | | Termination | 1.28 | 6.91 | 0.25 | 0.10 | 0.01 | 0.12 | |

APPENDIX 10 (cont) Hematology - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | HGB g/dL | HCT % | RBC x10^6/uL | RETIC x10^9/L | PLT x10^3/uL | MCV fL | MCH pg | MCHC g/dL | RDW % | WBC x10^3/uL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2M | 2007 | Week 5 | 16.8 | 51.4 | 8.63 | 256.2 | 1100 | 59.5 | 19.4 | 32.7 | 11.3 | 10.72 |
| | | Termination | 15.2 | 46.1 | 8.60 | 230.9 | 1141 | 53.6 | 17.7 | 33.0 | 13.1 | 9.95 |
| | 2008 | Week 5 | 16.8 | 52.3 | 8.55 | 254.8 | 1032 | 61.1 | 19.7 | 32.2 | 11.8 | 13.48 |
| | | Termination | 14.8 | 45.2 | 8.16 | 182.6 | 1003 | 55.5 | 18.1 | 32.7 | 14.0 | 13.55 |
| | 2009 | Week 5 | 16.8 | 51.6 | 8.33 | 175.3 | 864 | 62.0 | 20.1 | 32.5 | 11.7 | 9.27 |
| | | Termination | 15.7 | 47.7 | 8.63 | 146.2 | 895 | 55.3 | 18.3 | 33.0 | 13.3 | 8.28 |
| | 2010 | Week 5 | 15.9 | 48.3 | 8.08 | 213.2 | 894 | 59.8 | 19.7 | 33.0 | 11.8 | 9.32 |
| | | Termination | 15.1 | 45.8 | 8.43 | 215.0 | 900 | 54.3 | 17.9 | 33.0 | 14.8 | 9.52 |
| 3M | 3001 | Week 5 | 16.5 | 50.8 | 8.08 | 248.1 | 820 | 62.8 | 20.4 | 32.4 | 11.3 | 10.23 |
| | | Termination | 15.4 | 47.6 | 8.32 | 257.9 | 931 | 57.2 | 18.5 | 32.3 | 14.0 | 16.30 |
| | 3002 | Week 5 | 17.1 | 52.2 | 8.79 | 200.3 | 1083 | 59.4 | 19.4 | 32.7 | 11.0 | 11.02 |
| | | Termination | 15.0 | 46.2 | 8.30 | 129.9 | 958 | 55.7 | 18.0 | 32.3 | 12.7 | 9.85 |
| | 3003 | Week 5 | 16.9 | 51.0 | 8.58 | 219.0 | 1042 | 59.4 | 19.7 | 33.2 | 11.6 | 7.71 |
| | | Termination | 14.6 | 45.9 | 8.34 | 226.5 | 971 | 55.1 | 17.5 | 31.7 | 14.2 | 11.44 |
| | 3004 | Week 5 | 16.8 | 50.8 | 8.31 | 338.8 | 710 | 61.2 | 20.2 | 33.0 | 11.8 | 10.97 |
| | | Termination | 14.5 | 44.4 | 7.93 | 313.4 | 918 | 56.0 | 18.3 | 32.6 | 14.4 | 12.20 |

APPENDIX 10 (cont) Hematology - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | ANEU x10^3/uL | ALYM x10^3/uL | AMONO x10^3/uL | AEOS x10^3/uL | ABASO x10^3/uL | ALUC x10^3/uL | SCM1 |
|---|---|---|---|---|---|---|---|---|---|
| 2M | 2007 | Week 5 | 1.64 | 8.65 | 0.22 | 0.08 | 0.04 | 0.10 | |
| | | Termination | 1.32 | 7.76 | 0.50 | 0.20 | 0.02 | 0.14 | |
| | 2008 | Week 5 | 1.55 | 11.52 | 0.15 | 0.09 | 0.04 | 0.13 | |
| | | Termination | 1.69 | 11.19 | 0.34 | 0.16 | 0.03 | 0.14 | |
| | 2009 | Week 5 | 0.76 | 8.13 | 0.16 | 0.07 | 0.02 | 0.12 | |
| | | Termination | 0.70 | 7.19 | 0.22 | 0.09 | 0.01 | 0.07 | |
| | 2010 | Week 5 | 0.98 | 8.00 | 0.17 | 0.06 | 0.03 | 0.08 | |
| | | Termination | 1.28 | 7.62 | 0.32 | 0.09 | 0.02 | 0.19 | |
| 3M | 3001 | Week 5 | 1.29 | 8.56 | 0.15 | 0.12 | 0.03 | 0.09 | |
| | | Termination | 1.73 | 13.66 | 0.49 | 0.28 | 0.04 | 0.10 | |
| | 3002 | Week 5 | 1.35 | 9.14 | 0.24 | 0.11 | 0.03 | 0.15 | |
| | | Termination | 1.17 | 8.09 | 0.25 | 0.18 | 0.02 | 0.15 | |
| | 3003 | Week 5 | 1.40 | 5.97 | 0.14 | 0.10 | 0.02 | 0.07 | |
| | | Termination | 2.43 | 8.36 | 0.34 | 0.21 | 0.02 | 0.08 | |
| | 3004 | Week 5 | 1.84 | 8.59 | 0.24 | 0.17 | 0.03 | 0.10 | CLSL |
| | | Termination | 1.77 | 9.75 | 0.30 | 0.24 | 0.03 | 0.11 | |

APPENDIX 10 (cont) Hematology - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | HGB g/dL | HCT % | RBC x10^6/uL | RETIC x10^9/L | PLT x10^3/uL | MCV fL | MCH pg | MCHC g/dL | RDW % | WBC x10^3/uL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3M | 3005 | Week 5 | 15.5 | 48.6 | 8.31 | 224.0 | 1003 | 58.5 | 18.7 | 32.0 | 11.4 | 12.54 |
| | | Termination | 14.8 | 45.2 | 8.51 | 216.7 | 973 | 53.1 | 17.4 | 32.7 | 13.3 | 19.31 |
| | 3006 | Week 5 | 17.0 | 52.0 | 8.29 | 298.3 | 769 | 62.7 | 20.6 | 32.8 | 11.5 | 10.41 |
| | | Termination | 15.7 | 47.7 | 8.54 | 274.8 | 821 | 55.8 | 18.4 | 32.9 | 13.9 | 9.89 |
| | 3007 | Week 5 | 15.2 | 47.2 | 7.79 | 236.3 | 852 | 60.5 | 19.6 | 32.3 | 12.0 | 10.71 |
| | | Termination | 14.7 | 44.8 | 8.17 | 269.5 | 890 | 54.9 | 18.0 | 32.7 | 14.7 | 14.54 |
| | 3008 | Week 5 | 16.9 | 52.4 | 8.93 | 248.1 | 893 | 58.7 | 19.0 | 32.3 | 11.8 | 11.89 |
| | | Termination | 14.7 | 45.9 | 8.50 | 247.7 | 969 | 53.9 | 17.3 | 32.1 | 14.3 | 13.38 |
| | 3009 | Week 5 | 15.5 | 48.2 | 7.87 | 292.2 | 1053 | 61.3 | 19.7 | 32.1 | 11.9 | 11.60 |
| | | Termination | 14.1 | 43.3 | 7.85 | 304.7 | 1006 | 55.2 | 18.0 | 32.6 | 15.5 | 12.44 |
| | 3010 | Week 5 | 16.7 | 50.5 | 7.98 | 223.6 | 994 | 63.3 | 20.9 | 33.1 | 11.4 | 10.95 |
| | | Termination | 15.4 | 45.8 | 8.13 | 186.9 | 1105 | 56.3 | 19.0 | 33.7 | 13.1 | 13.71 |
| 4M | 4001 | Week 5 | 15.9 | 48.9 | 7.84 | 288.7 | 997 | 62.3 | 20.2 | 32.5 | 11.5 | 10.50 |
| | | Termination | 14.0 | 42.7 | 7.61 | 290.6 | 1199 | 56.1 | 18.3 | 32.7 | 12.8 | 12.19 |
| | 4002 | Week 5 | 16.8 | 53.2 | 8.81 | 317.7 | 564 | 60.4 | 19.1 | 31.7 | 12.1 | 9.91 |
| | | Termination | 14.0 | 43.0 | 8.03 | 227.1 | 966 | 53.5 | 17.4 | 32.5 | 13.2 | 11.41 |

APPENDIX 10 (cont) Hematology - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | ANEU x10^3/uL | ALYM x10^3/uL | AMONO x10^3/uL | AEOS x10^3/uL | ABASO x10^3/uL | ALUC x10^3/uL | SCM1 |
|---|---|---|---|---|---|---|---|---|---|
| 3M | 3005 | Week 5 | 1.32 | 10.67 | 0.33 | 0.08 | 0.03 | 0.11 | |
| | | Termination | 1.13 | 17.33 | 0.48 | 0.19 | 0.06 | 0.12 | |
| | 3006 | Week 5 | 1.24 | 8.63 | 0.25 | 0.15 | 0.02 | 0.12 | NCLP |
| | | Termination | 1.21 | 7.81 | 0.49 | 0.24 | 0.03 | 0.12 | |
| | 3007 | Week 5 | 2.31 | 7.78 | 0.39 | 0.10 | 0.02 | 0.11 | |
| | | Termination | 2.25 | 11.31 | 0.60 | 0.16 | 0.05 | 0.17 | |
| | 3008 | Week 5 | 1.13 | 10.33 | 0.19 | 0.09 | 0.04 | 0.11 | |
| | | Termination | 1.33 | 11.03 | 0.48 | 0.22 | 0.04 | 0.28 | |
| | 3009 | Week 5 | 1.16 | 9.95 | 0.24 | 0.09 | 0.05 | 0.12 | |
| | | Termination | 1.10 | 10.65 | 0.36 | 0.12 | 0.02 | 0.20 | |
| | 3010 | Week 5 | 1.33 | 9.16 | 0.24 | 0.07 | 0.04 | 0.12 | |
| | | Termination | 1.83 | 11.01 | 0.52 | 0.21 | 0.03 | 0.10 | |
| 4M | 4001 | Week 5 | 0.65 | 9.43 | 0.19 | 0.07 | 0.04 | 0.13 | |
| | | Termination | 0.93 | 10.78 | 0.22 | 0.13 | 0.01 | 0.12 | |
| | 4002 | Week 5 | 1.81 | 7.33 | 0.28 | 0.37 | 0.03 | 0.09 | CLSE |
| | | Termination | 2.49 | 8.13 | 0.40 | 0.17 | 0.02 | 0.19 | |

APPENDIX 10 (cont) Hematology - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | HGB g/dL | HCT % | RBC x10^6/uL | RETIC x10^9/L | PLT x10^3/uL | MCV fL | MCH pg | MCHC g/dL | RDW % | WBC x10^3/uL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4M | 4003 | Week 5 | 16.3 | 49.6 | 7.93 | 228.6 | 1029 | 62.5 | 20.6 | 32.9 | 11.1 | 9.83 |
| | | Termination | CS | CS | CS | CS | CS | CS | CS | CS | CS | CS |
| | 4004 | Week 5 | 17.0 | 51.4 | 8.34 | 202.1 | 1238 | 61.6 | 20.4 | 33.0 | 11.1 | 13.00 |
| | | Termination | 15.0 | 45.0 | 8.21 | 155.5 | 1034 | 54.8 | 18.3 | 33.4 | 12.8 | 12.48 |
| | 4005 | Week 5 | 15.7 | 47.9 | 7.90 | 189.1 | 1109 | 60.7 | 19.9 | 32.8 | 11.3 | 7.54 |
| | | Termination | CS | CS | CS | CS | CS | CS | CS | CS | CS | CS |
| | 4006 | Week 5 | 17.6 | 53.2 | 8.68 | 238.0 | 772 | 61.2 | 20.3 | 33.1 | 11.0 | 10.21 |
| | | Termination | 15.7 | 48.1 | 8.67 | 188.3 | 975 | 55.5 | 18.1 | 32.7 | 12.7 | 9.06 |
| | 4007 | Week 5 | 16.7 | 52.7 | 8.51 | 334.8 | 815 | 61.9 | 19.6 | 31.7 | 11.3 | 7.08 |
| | | Termination | 15.6 | 47.8 | 8.71 | 242.3 | 737 | 54.9 | 17.9 | 32.6 | 12.2 | 8.84 |
| | 4008 | Week 5 | 16.5 | 50.9 | 8.46 | 222.7 | 781 | 60.1 | 19.5 | 32.4 | 11.4 | 8.12 |
| | | Termination | 15.3 | 46.5 | 8.30 | 155.5 | 742 | 56.0 | 18.4 | 32.9 | 12.9 | 11.13 |
| | 4009 | Week 5 | 16.6 | 51.6 | 8.34 | 215.8 | 851 | 61.8 | 19.9 | 32.2 | 11.0 | 10.82 |
| | | Termination | 15.5 | 47.4 | 8.73 | 174.4 | 981 | 54.3 | 17.8 | 32.8 | 12.7 | 12.44 |
| | 4010 | Week 5 | 14.7 | 53.3 | 8.94 | 267.2 | 939 | 59.6 | 16.5 | 27.7 | 11.7 | 11.54 |
| | | Termination | 14.4 | 43.6 | 8.20 | 191.2 | 971 | 53.2 | 17.5 | 32.9 | 14.8 | 8.07 |

APPENDIX 10 (cont) Hematology - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | ANEU x10^3/uL | ALYM x10^3/uL | AMONO x10^3/uL | AEOS x10^3/uL | ABASO x10^3/uL | ALUC x10^3/uL | SCM1 |
|---|---|---|---|---|---|---|---|---|---|
| 4M | 4003 | Week 5 | 1.64 | 7.76 | 0.16 | 0.14 | 0.03 | 0.11 | |
| | | Termination | CS | CS | CS | CS | CS | CS | |
| | 4004 | Week 5 | 0.90 | 11.66 | 0.16 | 0.08 | 0.04 | 0.16 | |
| | | Termination | 0.85 | 11.12 | 0.21 | 0.14 | 0.05 | 0.10 | |
| | 4005 | Week 5 | 1.01 | 6.17 | 0.21 | 0.05 | 0.02 | 0.08 | |
| | | Termination | CS | CS | CS | CS | CS | CS | |
| | 4006 | Week 5 | 0.98 | 8.85 | 0.15 | 0.13 | 0.04 | 0.06 | CLSE |
| | | Termination | 0.79 | 7.75 | 0.25 | 0.13 | 0.02 | 0.11 | |
| | 4007 | Week 5 | 0.89 | 5.82 | 0.16 | 0.10 | 0.02 | 0.09 | |
| | | Termination | 1.08 | 7.11 | 0.40 | 0.17 | 0.01 | 0.06 | CLSE |
| | 4008 | Week 5 | 1.07 | 6.73 | 0.13 | 0.09 | 0.03 | 0.08 | CLSL |
| | | Termination | 0.80 | 9.74 | 0.33 | 0.13 | 0.02 | 0.11 | NCLP |
| | 4009 | Week 5 | 0.86 | 9.36 | 0.29 | 0.09 | 0.03 | 0.19 | |
| | | Termination | 0.92 | 10.84 | 0.36 | 0.12 | 0.02 | 0.18 | |
| | 4010 | Week 5 | 1.19 | 10.05 | 0.14 | 0.04 | 0.03 | 0.09 | |
| | | Termination | 1.09 | 6.62 | 0.18 | 0.06 | 0.00 | 0.13 | |

APPENDIX 10 (cont) Hematology - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | HGB g/dL | HCT % | RBC x10^6/uL | RETIC x10^9/L | PLT x10^3/uL | MCV fL | MCH pg | MCHC g/dL | RDW % | WBC x10^3/uL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | 1501 | Week 5 | 15.4 | 43.9 | 7.54 | 222.4 | 1029 | 58.3 | 20.4 | 35.0 | 11.2 | 12.57 |
| | | Termination | 13.8 | 41.6 | 7.41 | 180.7 | 826 | 56.1 | 18.7 | 33.2 | 11.7 | 13.18 |
| | 1502 | Week 5 | 17.1 | 49.1 | 8.52 | 157.6 | 1113 | 57.7 | 20.0 | 34.7 | 10.5 | 8.57 |
| | | Termination | 14.7 | 44.7 | 7.89 | 228.0 | 864 | 56.7 | 18.7 | 32.9 | 11.6 | 4.42 |
| | 1503 | Week 5 | 15.6 | 45.3 | 7.94 | 205.7 | 1053 | 57.1 | 19.6 | 34.3 | 11.1 | 10.19 |
| | | Termination | 13.6 | 41.5 | 7.59 | 225.6 | 913 | 54.7 | 17.9 | 32.7 | 12.6 | 6.70 |
| | 1504 | Week 5 | 16.9 | 49.1 | 8.45 | 219.1 | 1125 | 58.1 | 20.0 | 34.5 | 11.0 | 7.49 |
| | | Termination | 14.3 | 42.2 | 7.55 | 165.2 | 923 | 55.9 | 18.9 | 33.9 | 11.4 | 4.84 |
| | 1505 | Week 5 | 17.2 | 51.6 | 8.51 | 252.8 | 968 | 60.7 | 20.2 | 33.2 | 11.1 | 8.63 |
| | | Termination | 14.8 | 45.1 | 7.69 | 199.3 | 822 | 58.6 | 19.2 | 32.7 | 11.6 | 5.89 |
| | 1506 | Week 5 | CS | CS | CS | CS | CS | CS | CS | CS | CS | CS |
| | | Termination | 15.3 | 47.5 | 8.34 | 178.9 | 962 | 56.9 | 18.3 | 32.2 | 11.5 | 9.70 |
| | 1507 | Week 5 | 16.2 | 46.9 | 8.33 | 234.4 | 1202 | 56.4 | 19.4 | 34.4 | 11.3 | 10.40 |
| | | Termination | 14.3 | 42.6 | 7.70 | 181.7 | 1052 | 55.3 | 18.6 | 33.6 | 11.7 | 6.13 |
| | 1508 | Week 5 | 15.5 | 45.9 | 8.19 | 185.4 | 1090 | 56.1 | 18.9 | 33.7 | 10.6 | 7.27 |
| | | Termination | 13.6 | 42.1 | 7.73 | 143.1 | 927 | 54.4 | 17.6 | 32.4 | 11.0 | 4.30 |

APPENDIX 10 (cont) Hematology - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | ANEU x10^3/uL | ALYM x10^3/uL | AMONO x10^3/uL | AEOS x10^3/uL | ABASO x10^3/uL | ALUC x10^3/uL | SCM1 |
|---|---|---|---|---|---|---|---|---|---|
| 1F | 1501 | Week 5 | 0.83 | 11.22 | 0.11 | 0.14 | 0.04 | 0.23 | |
| | | Termination | 1.56 | 10.90 | 0.33 | 0.23 | 0.06 | 0.11 | |
| | 1502 | Week 5 | 0.51 | 7.68 | 0.13 | 0.10 | 0.01 | 0.13 | |
| | | Termination | 0.46 | 3.72 | 0.10 | 0.10 | 0.01 | 0.02 | |
| | 1503 | Week 5 | 0.72 | 9.15 | 0.14 | 0.07 | 0.02 | 0.09 | |
| | | Termination | 1.07 | 5.26 | 0.22 | 0.10 | 0.02 | 0.04 | |
| | 1504 | Week 5 | 0.66 | 6.63 | 0.06 | 0.07 | 0.02 | 0.06 | |
| | | Termination | 0.64 | 3.88 | 0.17 | 0.09 | 0.01 | 0.04 | |
| | 1505 | Week 5 | 0.46 | 7.88 | 0.09 | 0.09 | 0.02 | 0.09 | |
| | | Termination | 0.63 | 4.99 | 0.12 | 0.11 | 0.01 | 0.03 | |
| | 1506 | Week 5 | CS | CS | CS | CS | CS | CS | |
| | | Termination | 1.63 | 7.70 | 0.19 | 0.10 | 0.03 | 0.05 | |
| | 1507 | Week 5 | 0.93 | 9.12 | 0.14 | 0.10 | 0.03 | 0.08 | |
| | | Termination | 0.53 | 5.33 | 0.11 | 0.11 | 0.01 | 0.04 | |
| | 1508 | Week 5 | 0.62 | 6.40 | 0.12 | 0.06 | 0.01 | 0.06 | |
| | | Termination | 0.48 | 3.61 | 0.11 | 0.05 | 0.01 | 0.05 | |

APPENDIX 10 (cont) Hematology - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | HGB g/dL | HCT % | RBC x10^6/uL | RETIC x10^9/L | PLT x10^3/uL | MCV fL | MCH pg | MCHC g/dL | RDW % | WBC x10^3/uL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | 1509 | Week 5 | 16.6 | 48.1 | 8.21 | 222.3 | 523 | 58.6 | 20.3 | 34.6 | 10.9 | 14.61 |
| | | Termination | 14.9 | 44.9 | 8.01 | 122.6 | 918 | 56.0 | 18.6 | 33.2 | 10.8 | 12.68 |
| | 1510 | Week 5 | 15.5 | 46.1 | 8.20 | 154.5 | 1100 | 56.2 | 18.9 | 33.7 | 10.7 | 9.73 |
| | | Termination | 14.4 | 45.1 | 8.22 | 195.6 | 989 | 54.9 | 17.6 | 32.0 | 11.6 | 9.42 |
| 2F | 2501 | Week 5 | 15.3 | 44.6 | 7.47 | 207.2 | 1101 | 59.7 | 20.5 | 34.3 | 11.0 | 10.39 |
| | | Termination | 15.0 | 46.3 | 8.07 | 141.9 | 937 | 57.4 | 18.6 | 32.5 | 11.4 | 6.50 |
| | 2502 | Week 5 | 16.5 | 48.9 | 8.22 | 153.6 | 1116 | 59.6 | 20.1 | 33.7 | 10.9 | 10.56 |
| | | Termination | 14.9 | 45.4 | 7.85 | 164.1 | 907 | 57.8 | 19.0 | 32.8 | 11.8 | 9.37 |
| | 2503 | Week 5 | 15.8 | 44.9 | 7.75 | 159.2 | 988 | 58.0 | 20.3 | 35.1 | 10.8 | 12.73 |
| | | Termination | 14.0 | 42.0 | 7.62 | 148.8 | 982 | 55.1 | 18.4 | 33.4 | 11.8 | 10.31 |
| | 2504 | Week 5 | 16.4 | 48.4 | 8.25 | 153.1 | 1205 | 58.7 | 19.9 | 33.9 | 10.9 | 18.56 |
| | | Termination | 14.8 | 45.0 | 8.15 | 121.4 | 1062 | 55.2 | 18.1 | 32.8 | 11.1 | 12.49 |
| | 2505 | Week 5 | 15.7 | 45.5 | 7.84 | 197.1 | 1212 | 58.1 | 20.0 | 34.4 | 11.2 | 10.05 |
| | | Termination | 14.9 | 42.1 | 7.42 | 161.3 | 1083 | 56.7 | 20.1 | 35.4 | 12.2 | 8.60 |
| | 2506 | Week 5 | 16.8 | 48.1 | 7.82 | 224.5 | 1121 | 61.5 | 21.5 | 34.9 | 10.7 | 9.89 |
| | | Termination | 15.5 | 47.0 | 7.96 | 240.7 | 982 | 59.1 | 19.4 | 32.9 | 11.5 | 9.03 |

APPENDIX 10 (cont) Hematology - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | ANEU x10^3/uL | ALYM x10^3/uL | AMONO x10^3/uL | AEOS x10^3/uL | ABASO x10^3/uL | ALUC x10^3/uL | SCM1 |
|---|---|---|---|---|---|---|---|---|---|
| 1F | 1509 | Week 5 | 1.77 | 12.10 | 0.23 | 0.33 | 0.05 | 0.13 | CLSE |
| | | Termination | 0.98 | 11.19 | 0.26 | 0.12 | 0.05 | 0.09 | |
| | 1510 | Week 5 | 0.89 | 8.27 | 0.28 | 0.09 | 0.02 | 0.19 | |
| | | Termination | 1.22 | 7.72 | 0.30 | 0.07 | 0.03 | 0.08 | |
| 2F | 2501 | Week 5 | 0.56 | 9.41 | 0.20 | 0.09 | 0.02 | 0.10 | |
| | | Termination | 0.57 | 5.62 | 0.13 | 0.11 | 0.02 | 0.05 | |
| | 2502 | Week 5 | 0.91 | 9.29 | 0.11 | 0.16 | 0.03 | 0.05 | |
| | | Termination | 0.62 | 8.26 | 0.21 | 0.17 | 0.03 | 0.09 | |
| | 2503 | Week 5 | 0.78 | 11.09 | 0.16 | 0.49 | 0.04 | 0.18 | |
| | | Termination | 0.47 | 9.48 | 0.13 | 0.10 | 0.03 | 0.10 | |
| | 2504 | Week 5 | 1.17 | 16.83 | 0.15 | 0.11 | 0.08 | 0.23 | |
| | | Termination | 0.67 | 11.28 | 0.17 | 0.13 | 0.06 | 0.18 | |
| | 2505 | Week 5 | 0.55 | 9.18 | 0.11 | 0.07 | 0.03 | 0.11 | |
| | | Termination | 0.64 | 7.60 | 0.13 | 0.13 | 0.02 | 0.07 | |
| | 2506 | Week 5 | 0.82 | 8.71 | 0.15 | 0.10 | 0.02 | 0.09 | |
| | | Termination | 0.73 | 7.87 | 0.17 | 0.13 | 0.05 | 0.07 | |

APPENDIX 10 (cont) Hematology - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | HGB g/dL | HCT % | RBC x10^6/uL | RETIC x10^9/L | PLT x10^3/uL | MCV fL | MCH pg | MCHC g/dL | RDW % | WBC x10^3/uL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2F | 2507 | Week 5 | 15.4 | 44.5 | 7.44 | 166.2 | 1035 | 59.8 | 20.7 | 34.7 | 11.0 | 11.84 |
| | | Termination | CS | CS | CS | CS | CS | CS | CS | CS | CS | CS |
| | 2508 | Week 5 | 15.7 | 46.1 | 8.01 | 284.4 | 1036 | 57.6 | 19.7 | 34.2 | 10.9 | 10.99 |
| | | Termination | 14.5 | 44.1 | 7.82 | 261.4 | 979 | 56.5 | 18.5 | 32.8 | 11.5 | 6.09 |
| | 2509 | Week 5 | 15.9 | 45.7 | 7.71 | 213.2 | 1323 | 59.4 | 20.6 | 34.7 | 11.7 | 10.87 |
| | | Termination | 14.7 | 44.0 | 7.69 | 144.3 | 1170 | 57.2 | 19.1 | 33.3 | 11.8 | 11.39 |
| | 2510 | Week 5 | 16.2 | 47.3 | 8.09 | 157.1 | 1203 | 58.5 | 20.0 | 34.2 | 10.3 | 12.70 |
| | | Termination | 14.4 | 43.3 | 7.67 | 156.1 | 1035 | 56.5 | 18.8 | 33.3 | 11.1 | 9.01 |
| 3F | 3501 | Week 5 | 16.5 | 47.7 | 8.11 | 174.0 | 1142 | 58.8 | 20.4 | 34.7 | 10.8 | 7.50 |
| | | Termination | 14.6 | 44.8 | 7.78 | 156.7 | 989 | 57.5 | 18.8 | 32.6 | 11.4 | 5.75 |
| | 3502 | Week 5 | 16.6 | 48.0 | 8.07 | 191.3 | 909 | 59.5 | 20.6 | 34.6 | 11.0 | 8.88 |
| | | Termination | 14.5 | 43.3 | 7.58 | 213.9 | 786 | 57.1 | 19.1 | 33.4 | 11.7 | 5.12 |
| | 3503 | Week 5 | 15.8 | 46.0 | 8.18 | 132.3 | 1107 | 56.2 | 19.3 | 34.4 | 10.4 | 8.65 |
| | | Termination | 14.8 | 42.1 | 7.81 | 189.8 | 939 | 53.9 | 19.0 | 35.2 | 12.1 | 8.39 |
| | 3504 | Week 5 | 16.3 | 46.7 | 7.86 | 146.9 | 1107 | 59.4 | 20.8 | 35.0 | 10.9 | 10.12 |
| | | Termination | 14.7 | 44.6 | 7.75 | 157.0 | 878 | 57.5 | 19.0 | 33.0 | 11.4 | 6.69 |

APPENDIX 10 (cont) Hematology - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | ANEU x10^3/uL | ALYM x10^3/uL | AMONO x10^3/uL | AEOS x10^3/uL | ABASO x10^3/uL | ALUC x10^3/uL | SCM1 |
|---|---|---|---|---|---|---|---|---|---|
| 2F | 2507 | Week 5 | 0.96 | 10.33 | 0.24 | 0.10 | 0.04 | 0.17 | |
| | | Termination | CS | CS | CS | CS | CS | CS | |
| | 2508 | Week 5 | 0.74 | 9.66 | 0.26 | 0.14 | 0.04 | 0.15 | |
| | | Termination | 0.54 | 5.18 | 0.19 | 0.14 | 0.01 | 0.04 | |
| | 2509 | Week 5 | 1.34 | 8.87 | 0.22 | 0.28 | 0.03 | 0.13 | |
| | | Termination | 0.52 | 10.29 | 0.20 | 0.17 | 0.04 | 0.17 | |
| | 2510 | Week 5 | 0.69 | 11.51 | 0.22 | 0.14 | 0.04 | 0.09 | |
| | | Termination | 0.82 | 7.53 | 0.33 | 0.15 | 0.02 | 0.16 | |
| 3F | 3501 | Week 5 | 0.52 | 6.66 | 0.14 | 0.09 | 0.03 | 0.06 | |
| | | Termination | 0.54 | 4.90 | 0.12 | 0.14 | 0.02 | 0.03 | |
| | 3502 | Week 5 | 0.68 | 7.86 | 0.13 | 0.11 | 0.02 | 0.09 | |
| | | Termination | 0.67 | 4.21 | 0.09 | 0.11 | 0.01 | 0.03 | NCLP |
| | 3503 | Week 5 | 0.61 | 7.69 | 0.18 | 0.06 | 0.03 | 0.10 | |
| | | Termination | 1.18 | 6.70 | 0.29 | 0.09 | 0.03 | 0.10 | |
| | 3504 | Week 5 | 0.66 | 9.01 | 0.17 | 0.14 | 0.03 | 0.12 | |
| | | Termination | 0.67 | 5.61 | 0.23 | 0.13 | 0.02 | 0.03 | |

APPENDIX 10 (cont) Hematology - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | HGB g/dL | HCT % | RBC x10^6/uL | RETIC x10^9/L | PLT x10^3/uL | MCV fL | MCH pg | MCHC g/dL | RDW % | WBC x10^3/uL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3F | 3505 | Week 5 | 15.9 | 46.2 | 7.71 | 287.6 | 967 | 59.9 | 20.6 | 34.4 | 11.4 | 7.32 |
| | | Termination | 14.7 | 43.1 | 7.59 | 214.2 | 827 | 56.8 | 19.3 | 34.0 | 11.7 | 8.56 |
| | 3506 | Week 5 | CS | CS | CS | CS | CS | CS | CS | CS | CS | CS |
| | | Termination | 14.4 | 43.3 | 8.19 | 154.6 | 885 | 52.8 | 17.6 | 33.3 | 11.7 | 7.13 |
| | 3507 | Week 5 | 15.9 | 46.2 | 8.19 | 111.7 | 996 | 56.4 | 19.4 | 34.4 | 10.7 | 8.59 |
| | | Termination | 14.4 | 43.5 | 7.93 | 141.0 | 890 | 54.8 | 18.1 | 33.1 | 11.5 | 9.33 |
| | 3508 | Week 5 | 16.6 | 48.9 | 8.61 | 223.3 | 1160 | 56.8 | 19.3 | 33.9 | 11.4 | 9.34 |
| | | Termination | 15.0 | 45.0 | 8.33 | 140.8 | 994 | 54.0 | 18.0 | 33.4 | 12.5 | 10.46 |
| | 3509 | Week 5 | 16.7 | 48.9 | 8.18 | 148.6 | 1183 | 59.8 | 20.4 | 34.2 | 11.0 | 10.50 |
| | | Termination | 15.2 | 46.3 | 8.02 | 136.5 | 1121 | 57.7 | 18.9 | 32.8 | 11.0 | 6.27 |
| | 3510 | Week 5 | 15.6 | 44.9 | 7.68 | 212.5 | 1142 | 58.5 | 20.4 | 34.8 | 11.1 | 10.66 |
| | | Termination | 14.4 | 42.4 | 7.55 | 202.4 | 1061 | 56.1 | 19.1 | 34.0 | 11.9 | 12.87 |
| 4F | 4501 | Week 5 | 16.8 | 48.7 | 8.06 | 199.9 | 983 | 60.4 | 20.8 | 34.4 | 10.8 | 14.22 |
| | | Termination | 14.9 | 40.3 | 6.98 | 199.3 | 874 | 57.7 | 21.4 | 37.1 | 11.6 | 9.98 |
| | 4502 | Week 5 | 16.5 | 47.7 | 8.67 | 236.1 | 1065 | 55.0 | 19.0 | 34.6 | 11.7 | 9.10 |
| | | Termination | 14.2 | 37.0 | 7.01 | 180.7 | 823 | 52.7 | 20.3 | 38.5 | 12.6 | 6.74 |

APPENDIX 10 (cont) Hematology - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | ANEU x10^3/uL | ALYM x10^3/uL | AMONO x10^3/uL | AEOS x10^3/uL | ABASO x10^3/uL | ALUC x10^3/uL | SCM1 |
|---|---|---|---|---|---|---|---|---|---|
| 3F | 3505 | Week 5 | 0.63 | 6.44 | 0.11 | 0.05 | 0.01 | 0.08 | |
| | | Termination | 0.74 | 7.29 | 0.33 | 0.12 | 0.03 | 0.05 | |
| | 3506 | Week 5 | CS | CS | CS | CS | CS | CS | |
| | | Termination | 0.58 | 6.08 | 0.26 | 0.15 | 0.01 | 0.05 | |
| | 3507 | Week 5 | 0.65 | 7.49 | 0.14 | 0.19 | 0.02 | 0.10 | |
| | | Termination | 0.50 | 8.33 | 0.20 | 0.17 | 0.03 | 0.09 | |
| | 3508 | Week 5 | 0.56 | 8.25 | 0.30 | 0.07 | 0.03 | 0.14 | |
| | | Termination | 1.43 | 8.47 | 0.35 | 0.10 | 0.03 | 0.09 | |
| | 3509 | Week 5 | 0.66 | 9.51 | 0.11 | 0.11 | 0.04 | 0.07 | |
| | | Termination | 0.41 | 5.47 | 0.18 | 0.15 | 0.02 | 0.05 | |
| | 3510 | Week 5 | 0.78 | 9.47 | 0.11 | 0.13 | 0.02 | 0.15 | |
| | | Termination | 0.63 | 11.61 | 0.28 | 0.19 | 0.05 | 0.11 | |
| 4F | 4501 | Week 5 | 0.65 | 13.09 | 0.14 | 0.12 | 0.05 | 0.17 | |
| | | Termination | 1.35 | 8.26 | 0.17 | 0.11 | 0.03 | 0.08 | |
| | 4502 | Week 5 | 1.32 | 7.46 | 0.18 | 0.05 | 0.01 | 0.08 | |
| | | Termination | 1.63 | 4.75 | 0.20 | 0.12 | 0.03 | 0.02 | |

APPENDIX 10 (cont) Hematology - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | HGB g/dL | HCT % | RBC x10^6/uL | RETIC x10^9/L | PLT x10^3/uL | MCV fL | MCH pg | MCHC g/dL | RDW % | WBC x10^3/uL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4F | 4503 | Week 5 | 15.9 | 46.5 | 8.25 | 154.9 | 1160 | 56.4 | 19.2 | 34.1 | 10.8 | 11.00 |
| | | Termination | 13.9 | 42.1 | 7.75 | 212.2 | 993 | 54.3 | 18.0 | 33.1 | 11.9 | 13.02 |
| | 4504 | Week 5 | 16.7 | 49.1 | 8.49 | 225.3 | 1079 | 57.8 | 19.7 | 34.1 | 11.0 | 9.79 |
| | | Termination | 15.2 | 46.1 | 8.15 | 222.7 | 870 | 56.5 | 18.6 | 32.9 | 11.2 | 6.33 |
| | 4505 | Week 5 | 14.7 | 43.4 | 7.79 | 314.9 | 918 | 55.8 | 18.9 | 33.8 | 10.8 | 13.18 |
| | | Termination | 14.6 | 43.9 | 8.22 | 201.8 | 802 | 53.4 | 17.7 | 33.2 | 12.4 | 8.53 |
| | 4506 | Week 5 | 16.2 | 48.3 | 8.07 | 164.1 | 969 | 59.8 | 20.0 | 33.5 | 10.3 | 10.05 |
| | | Termination | 15.3 | 46.6 | 8.01 | 145.4 | 866 | 58.2 | 19.1 | 32.8 | 10.7 | 8.46 |
| | 4507 | Week 5 | 15.5 | 45.5 | 7.96 | 238.8 | 1046 | 57.1 | 19.4 | 34.0 | 11.1 | 6.16 |
| | | Termination | 14.3 | 42.8 | 7.68 | 212.0 | 937 | 55.7 | 18.6 | 33.4 | 11.7 | 7.53 |
| | 4508 | Week 5 | 16.7 | 48.9 | 8.24 | 179.6 | 1166 | 59.4 | 20.2 | 34.0 | 11.3 | 10.73 |
| | | Termination | 14.7 | 44.2 | 7.65 | 149.6 | 915 | 57.8 | 19.2 | 33.2 | 12.0 | 7.67 |
| | 4509 | Week 5 | 17.0 | 50.0 | 8.59 | 225.3 | 1173 | 58.2 | 19.8 | 34.1 | 10.8 | 9.52 |
| | | Termination | 14.9 | 44.8 | 8.14 | 180.7 | 924 | 55.1 | 18.3 | 33.3 | 11.2 | 6.77 |
| | 4510 | Week 5 | 16.8 | 49.0 | 8.12 | 229.6 | 918 | 60.4 | 20.7 | 34.3 | 11.4 | 10.85 |
| | | Termination | 14.3 | 42.2 | 7.41 | 196.5 | 875 | 56.9 | 19.3 | 33.9 | 11.2 | 6.96 |

APPENDIX 10 (cont) Hematology - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | ANEU x10^3/uL | ALYM x10^3/uL | AMONO x10^3/uL | AEOS x10^3/uL | ABASO x10^3/uL | ALUC x10^3/uL | SCM1 |
|---|---|---|---|---|---|---|---|---|---|
| 4F | 4503 | Week 5 | 0.85 | 9.76 | 0.09 | 0.14 | 0.03 | 0.13 | |
| | | Termination | 2.88 | 9.56 | 0.31 | 0.11 | 0.05 | 0.12 | |
| | 4504 | Week 5 | 0.77 | 8.77 | 0.08 | 0.09 | 0.02 | 0.06 | |
| | | Termination | 0.80 | 5.27 | 0.11 | 0.11 | 0.01 | 0.03 | |
| | 4505 | Week 5 | 1.26 | 11.58 | 0.13 | 0.06 | 0.03 | 0.13 | |
| | | Termination | 0.91 | 7.28 | 0.12 | 0.09 | 0.04 | 0.10 | |
| | 4506 | Week 5 | 0.53 | 9.17 | 0.18 | 0.08 | 0.02 | 0.07 | |
| | | Termination | 0.76 | 7.29 | 0.17 | 0.12 | 0.02 | 0.09 | |
| | 4507 | Week 5 | 0.74 | 5.23 | 0.06 | 0.06 | 0.01 | 0.05 | |
| | | Termination | 0.72 | 6.43 | 0.19 | 0.10 | 0.02 | 0.07 | |
| | 4508 | Week 5 | 0.97 | 9.34 | 0.16 | 0.13 | 0.03 | 0.10 | |
| | | Termination | 0.81 | 6.53 | 0.16 | 0.08 | 0.02 | 0.07 | |
| | 4509 | Week 5 | 1.28 | 7.92 | 0.11 | 0.10 | 0.03 | 0.08 | |
| | | Termination | 0.59 | 5.91 | 0.12 | 0.08 | 0.03 | 0.04 | |
| | 4510 | Week 5 | 1.09 | 9.42 | 0.13 | 0.11 | 0.02 | 0.08 | |
| | | Termination | 0.43 | 6.22 | 0.15 | 0.09 | 0.02 | 0.06 | |

APPENDIX 11 Coagulation - individual values

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | Animal Number | Occasion Termination | PT Seconds | APTT Seconds |
|---|---|---|---|---|
| 1M | 1001 | | 16.2 | 20.0 |
| | 1002 | | 17.0 | 15.7 |
| | 1003 | | 16.8 | 19.0 |
| | 1004 | | 17.1 | 16.1 |
| | 1005 | | 15.1 | 15.0 |
| | 1006 | | 16.5 | 18.1 |
| | 1007 | | CS | CS |
| | 1008 | | CS | CS |
| | 1009 | | 16.8 | 19.5 |
| | 1010 | | CS | CS |
| 2M | 2001 | | 16.5 | 19.5 |
| | 2002 | | CS | CS |
| | 2003 | | 18.0 | 16.7 |
| | 2004 | | 16.6 | 16.8 |
| | 2005 | | 16.1 | 19.2 |
| | 2006 | | CS | CS |
| | 2007 | | 15.6 | 13.2 |
| | 2008 | | 15.6 | 15.6 |
| | 2009 | | 15.8 | 20.0 |
| | 2010 | | 15.7 | 11.6 |

APPENDIX 11 (cont) Coagulation - individual values

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | Animal Number | Occasion Termination | PT Seconds | APTT Seconds |
|---|---|---|---|---|
| 3M | 3001 | | 15.5 | 17.5 |
| | 3002 | | 16.8 | 23.7 |
| | 3003 | | 16.5 | 17.9 |
| | 3004 | | 16.3 | 18.2 |
| | 3005 | | CS | CS |
| | 3006 | | 15.8 | 16.1 |
| | 3007 | | CS | CS |
| | 3008 | | 16.3 | 14.9 |
| | 3009 | | CS | CS |
| | 3010 | | 17.3 | 19.6 |
| 4M | 4001 | | 16.3 | 15.6 |
| | 4002 | | 16.0 | 18.7 |
| | 4003 | | CS | CS |
| | 4004 | | 16.6 | 19.8 |
| | 4005 | | 16.5 | 18.6 |
| | 4006 | | 16.9 | 18.8 |
| | 4007 | | 16.5 | 15.0 |
| | 4008 | | CS | CS |
| | 4009 | | CS | CS |
| | 4010 | | 16.7 | 12.2 |

APPENDIX 11 (cont) Coagulation - individual values

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | Animal Number | Occasion Termination | PT Seconds | APTT Seconds |
|---|---|---|---|---|
| 1F | 1501 | | 14.2 | 16.2 |
| | 1502 | | 14.0 | 19.1 |
| | 1503 | | 14.5 | 20.6 |
| | 1504 | | 14.8 | 17.2 |
| | 1505 | | 14.8 | 16.2 |
| | 1506 | | 14.3 | 17.3 |
| | 1507 | | 14.1 | 17.6 |
| | 1508 | | 13.7 | 20.7 |
| | 1509 | | 15.0 | 13.2 |
| | 1510 | | CS | CS |
| 2F | 2501 | | 14.9 | 15.0 |
| | 2502 | | 15.2 | 19.7 |
| | 2503 | | 14.1 | 16.1 |
| | 2504 | | 15.4 | 15.1 |
| | 2505 | | 13.7 | 15.8 |
| | 2506 | | 14.4 | 14.9 |
| | 2507 | | CS | CS |
| | 2508 | | 14.3 | 16.1 |
| | 2509 | | 15.2 | 12.7 |
| | 2510 | | 14.8 | 13.5 |

APPENDIX 11 (cont) Coagulation - individual values

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group/ Sex | Animal Number | Occasion Termination | PT Seconds | APTT Seconds |
|---|---|---|---|---|
| 3F | 3501 | | 15.3 | 18.9 |
| | 3502 | | 14.8 | 20.5 |
| | 3503 | | 14.4 | 18.9 |
| | 3504 | | 15.0 | 17.3 |
| | 3505 | | 14.9 | 16.1 |
| | 3506 | | 14.3 | 15.0 |
| | 3507 | | 14.3 | 15.8 |
| | 3508 | | 14.6 | 14.6 |
| | 3509 | | 15.1 | 16.0 |
| | 3510 | | 15.0 | 16.3 |
| 4F | 4501 | | 14.8 | 15.3 |
| | 4502 | | 14.8 | 15.6 |
| | 4503 | | 14.8 | 17.0 |
| | 4504 | | 14.3 | 15.4 |
| | 4505 | | 15.0 | 15.7 |
| | 4506 | | 15.0 | 14.8 |
| | 4507 | | 14.1 | 13.7 |
| | 4508 | | 14.0 | 16.1 |
| | 4509 | | 14.5 | 20.1 |
| | 4510 | | 14.7 | 14.5 |

APPENDIX 12 Clinical chemistry - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | AST U/L | ALT U/L | ALKP U/L | BUN mg/dL | CREAT mg/dL | GLU mg/dL | CHOL mg/dL | TRIG mg/dL | TP g/dL | ALB g/dL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | 1001 | Week 5 | 86 | 60 | 243 | 22 | 0.2 | 84 | 89 | 82 | 5.9 | 4.1 |
| | | Termination | 80 | 39 | 104 | 17 | 0.2 | 138 | 70 | 78 | 5.5 | 3.6 |
| | 1002 | Week 5 | 135 | 55 | 199 | 22 | 0.2 | 91 | 71 | 74 | 6.2 | 4.0 |
| | | Termination | 161 | 32 | 70 | 17 | 0.3 | 102 | 48 | 57 | 5.9 | 3.8 |
| | 1003 | Week 5 | 163 | 61 | 252 | 14 | 0.2 | 93 | 90 | 83 | 6.2 | 4.1 |
| | | Termination | 114 | 56 | 108 | 15 | 0.3 | 112 | 69 | 39 | 6.1 | 3.9 |
| | 1004 | Week 5 | 145 | 57 | 201 | 14 | 0.2 | 89 | 74 | 62 | 6.2 | 4.2 |
| | | Termination | 105 | 48 | 70 | 15 | 0.2 | 101 | 53 | 42 | 5.9 | 3.8 |
| | 1005 | Week 5 | 105 | 54 | 204 | 24 | 0.2 | 109 | 104 | 167 | 6.4 | 4.3 |
| | | Termination | 79 | 29 | 84 | 17 | 0.2 | 157 | 88 | 257 | 6.5 | 3.9 |
| | 1006 | Week 5 | 167 | 77 | 232 | 28 | 0.2 | 81 | 68 | 59 | 6.2 | 4.2 |
| | | Termination | 124 | 45 | 82 | 19 | 0.2 | 115 | 59 | 49 | 6.0 | 3.7 |
| | 1007 | Week 5 | 129 | 64 | 282 | 13 | 0.2 | 115 | 93 | 135 | 6.8 | 4.4 |
| | | Termination | 98 | 38 | 92 | 16 | 0.5 | 161 | 63 | 84 | 5.8 | 3.7 |
| | 1008 | Week 5 | 99 | 54 | 251 | 13 | 0.2 | 107 | 73 | 91 | 6.3 | 4.2 |
| | | Termination | 98 | 38 | 79 | 15 | 0.2 | 150 | 61 | 72 | 5.6 | 3.7 |

APPENDIX 12 (cont) Clinical chemistry - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | Glob g/dL | A/G | TBILI mg/dL | Na+ mEq/L | K+ mEq/L | Cl- mEq/L | Ca++ mg/dL | PHOS mg/dL | SCD1 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | 1001 | Week 5 | 1.8 | 2.3 | <0.2 | 142 | 5.4 | 102 | 11.3 | 9.2 | |
| | | Termination | 1.9 | 1.9 | <0.2 | 143 | 5.0 | 105 | 9.9 | 6.2 | |
| | 1002 | Week 5 | 2.2 | 1.8 | <0.2 | 142 | 5.9 | 100 | 10.7 | 9.4 | |
| | | Termination | 2.1 | 1.8 | <0.2 | 144 | 5.3 | 103 | 10.0 | 8.2 | |
| | 1003 | Week 5 | 2.1 | 2.0 | <0.2 | 142 | 6.0 | 100 | 10.6 | 8.3 | |
| | | Termination | 2.2 | 1.8 | <0.2 | 145 | 5.0 | 102 | 9.7 | 7.5 | |
| | 1004 | Week 5 | 2.0 | 2.1 | <0.2 | 143 | 5.5 | 100 | 10.8 | 9.2 | |
| | | Termination | 2.1 | 1.8 | <0.2 | 147 | 4.8 | 103 | 10.1 | 7.7 | |
| | 1005 | Week 5 | 2.1 | 2.0 | <0.2 | 141 | 5.8 | 96 | 10.9 | 10.2 | SLH |
| | | Termination | 2.6 | 1.5 | <0.2 | 144 | 4.8 | 102 | 10.2 | 6.0 | |
| | 1006 | Week 5 | 2.0 | 2.1 | <0.2 | 141 | 6.1 | 101 | 11.2 | 9.5 | |
| | | Termination | 2.3 | 1.6 | <0.2 | 144 | 5.7 | 103 | 10.4 | 7.4 | |
| | 1007 | Week 5 | 2.4 | 1.8 | <0.2 | 142 | 5.4 | 100 | 11.0 | 8.5 | |
| | | Termination | 2.1 | 1.8 | <0.2 | 146 | 5.3 | 102 | 10.7 | 9.4 | |
| | 1008 | Week 5 | 2.1 | 2.0 | <0.2 | 141 | 5.4 | 100 | 11.3 | 8.2 | |
| | | Termination | 1.9 | 1.9 | <0.2 | 145 | 5.3 | 103 | 10.1 | 7.1 | |

APPENDIX 12 (cont) Clinical chemistry - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | AST U/L | ALT U/L | ALKP U/L | BUN mg/dL | CREAT mg/dL | GLU mg/dL | CHOL mg/dL | TRIG mg/dL | TP g/dL | ALB g/dL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | 1009 | Week 5 | 118 | 52 | 345 | 21 | 0.2 | 90 | 72 | 82 | 6.3 | 4.3 |
| | | Termination | 80 | 44 | 126 | 15 | 0.4 | 123 | 50 | 103 | 6.3 | 3.8 |
| | 1010 | Week 5 | 106 | 60 | 260 | 18 | 0.2 | 87 | 76 | 69 | 6.5 | 4.4 |
| | | Termination | 77 | 30 | 77 | 16 | 0.2 | 102 | 58 | 43 | 5.8 | 3.5 |
| 2M | 2001 | Week 5 | 113 | 64 | 392 | 17 | 0.2 | 92 | 121 | 154 | 6.7 | 4.6 |
| | | Termination | 140 | 46 | 136 | 17 | 0.2 | 140 | 80 | 65 | 5.9 | 3.7 |
| | 2002 | Week 5 | 101 | 58 | 253 | 13 | 0.2 | 114 | 82 | 148 | 6.7 | 4.3 |
| | | Termination | 96 | 46 | 90 | 17 | 0.2 | 145 | 63 | 74 | 6.2 | 3.9 |
| | 2003 | Week 5 | 104 | 48 | 239 | 19 | 0.2 | 84 | 80 | 58 | 6.2 | 4.1 |
| | | Termination | 95 | 28 | 97 | 14 | 0.2 | 113 | 65 | 36 | 5.9 | 3.8 |
| | 2004 | Week 5 | 135 | 55 | 238 | 16 | 0.2 | 95 | 87 | 70 | 6.5 | 4.3 |
| | | Termination | 117 | 40 | 86 | 14 | 0.3 | 102 | 63 | 43 | 6.0 | 3.7 |
| | 2005 | Week 5 | 112 | 72 | 233 | 13 | 0.2 | 97 | 93 | 114 | 6.2 | 4.2 |
| | | Termination | 98 | 42 | 89 | 12 | 0.2 | 160 | 63 | 76 | 6.1 | 3.8 |
| | 2006 | Week 5 | 158 | 57 | 181 | 17 | 0.2 | 111 | 76 | 108 | 6.9 | 4.6 |
| | | Termination | 102 | 34 | 54 | 13 | 0.2 | 164 | 53 | 61 | 6.2 | 3.8 |

APPENDIX 12 (cont) Clinical chemistry - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | Glob g/dL | A/G | TBILI mg/dL | Na+ mEq/L | K+ mEq/L | Cl- mEq/L | Ca++ mg/dL | PHOS mg/dL | SCD1 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1M | 1009 | Week 5 | 2.0 | 2.2 | <0.2 | 143 | 6.0 | 100 | 11.2 | 10.5 | |
| | | Termination | 2.5 | 1.5 | <0.2 | 145 | 4.7 | 104 | 10.6 | 7.5 | |
| | 1010 | Week 5 | 2.1 | 2.1 | <0.2 | 142 | 5.2 | 102 | 11.1 | 8.7 | |
| | | Termination | 2.3 | 1.5 | <0.2 | 146 | 4.8 | 106 | 10.1 | 6.5 | |
| 2M | 2001 | Week 5 | 2.1 | 2.2 | <0.2 | 142 | 4.6 | 101 | 11.5 | 8.6 | |
| | | Termination | 2.2 | 1.7 | <0.2 | 145 | 5.1 | 106 | 10.5 | 7.8 | |
| | 2002 | Week 5 | 2.4 | 1.8 | <0.2 | 142 | 5.1 | 98 | 11.2 | 8.5 | |
| | | Termination | 2.3 | 1.7 | <0.2 | 145 | 4.9 | 103 | 10.6 | 7.3 | |
| | 2003 | Week 5 | 2.1 | 2.0 | <0.2 | 142 | 5.5 | 100 | 11.3 | 9.0 | |
| | | Termination | 2.1 | 1.8 | <0.2 | 145 | 5.3 | 103 | 10.0 | 7.6 | |
| | 2004 | Week 5 | 2.2 | 2.0 | <0.2 | 142 | 4.9 | 101 | 10.9 | 9.1 | |
| | | Termination | 2.3 | 1.6 | <0.2 | 146 | 4.8 | 103 | 10.3 | 7.1 | |
| | 2005 | Week 5 | 2.0 | 2.1 | <0.2 | 141 | 5.3 | 101 | 11.4 | 8.7 | |
| | | Termination | 2.3 | 1.7 | <0.2 | 144 | 5.6 | 102 | 10.6 | 7.5 | |
| | 2006 | Week 5 | 2.3 | 2.0 | <0.2 | 141 | 5.2 | 100 | 12.3 | 8.0 | |
| | | Termination | 2.4 | 1.6 | <0.2 | 144 | 5.4 | 103 | 11.6 | 6.4 | |

APPENDIX 12 (cont) Clinical chemistry - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | AST U/L | ALT U/L | ALKP U/L | BUN mg/dL | CREAT mg/dL | GLU mg/dL | CHOL mg/dL | TRIG mg/dL | TP g/dL | ALB g/dL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2M | 2007 | Week 5 | 113 | 69 | 209 | 22 | 0.2 | 84 | 88 | 105 | 6.2 | 4.1 |
| | | Termination | 63 | 33 | 68 | 16 | 0.2 | 138 | 70 | 63 | 5.9 | 3.7 |
| | 2008 | Week 5 | 126 | 58 | 208 | 20 | 0.2 | 84 | 66 | 117 | 5.9 | 4.0 |
| | | Termination | 104 | 32 | 66 | 17 | 0.3 | 134 | 41 | 53 | 5.2 | 3.3 |
| | 2009 | Week 5 | 132 | 57 | 205 | 18 | 0.3 | 102 | 86 | 55 | 6.5 | 4.3 |
| | | Termination | 147 | 35 | 77 | 17 | 0.4 | 136 | 68 | 36 | 6.1 | 3.8 |
| | 2010 | Week 5 | 114 | 45 | 166 | 13 | 0.2 | 96 | 81 | 128 | 5.9 | 3.9 |
| | | Termination | 121 | 30 | 64 | 14 | 0.2 | 126 | 49 | 64 | 5.8 | 3.6 |
| 3M | 3001 | Week 5 | 99 | 73 | 254 | 20 | 0.2 | 88 | 81 | 62 | 6.0 | 4.1 |
| | | Termination | 80 | 59 | 125 | 15 | 0.2 | 157 | 57 | 65 | 6.1 | 3.8 |
| | 3002 | Week 5 | 173 | 56 | 238 | 27 | 0.3 | 90 | 88 | 91 | 6.8 | 4.7 |
| | | Termination | 95 | 43 | 81 | 15 | 0.2 | 130 | 48 | 39 | 5.7 | 3.8 |
| | 3003 | Week 5 | 115 | 60 | 245 | 11 | 0.2 | 91 | 65 | 102 | 6.2 | 4.2 |
| | | Termination | 83 | 39 | 103 | 14 | 0.2 | 124 | 45 | 68 | 6.0 | 3.8 |
| | 3004 | Week 5 | 91 | 51 | 207 | 13 | 0.3 | 98 | 94 | 245 | 6.4 | 4.3 |
| | | Termination | 86 | 29 | 79 | 13 | 0.2 | 131 | 62 | 98 | 5.7 | 3.6 |

APPENDIX 12 (cont) Clinical chemistry - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | Glob g/dL | A/G | TBILI mg/dL | Na+ mEq/L | K+ mEq/L | Cl- mEq/L | Ca++ mg/dL | PHOS mg/dL | SCD1 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2M | 2007 | Week 5 | 2.1 | 2.0 | <0.2 | 142 | 5.3 | 100 | 11.3 | 9.5 | |
| | | Termination | 2.2 | 1.7 | <0.2 | 145 | 5.5 | 105 | 10.9 | 7.5 | |
| | 2008 | Week 5 | 1.9 | 2.1 | <0.2 | 132 | 5.8 | 95 | 11.7 | 8.7 | |
| | | Termination | 1.9 | 1.7 | <0.2 | 145 | 4.9 | 106 | 10.1 | 7.0 | |
| | 2009 | Week 5 | 2.2 | 2.0 | <0.2 | 142 | 5.6 | 102 | 11.5 | 9.4 | |
| | | Termination | 2.3 | 1.7 | <0.2 | 145 | 5.1 | 105 | 10.6 | 6.9 | |
| | 2010 | Week 5 | 2.0 | 2.0 | <0.2 | 142 | 5.6 | 100 | 10.8 | 9.1 | |
| | | Termination | 2.2 | 1.6 | <0.2 | 144 | 5.2 | 105 | 10.2 | 7.2 | |
| 3M | 3001 | Week 5 | 1.9 | 2.2 | <0.2 | 143 | 5.2 | 102 | 11.5 | 9.2 | |
| | | Termination | 2.3 | 1.7 | <0.2 | 144 | 5.1 | 105 | 9.9 | 7.0 | |
| | 3002 | Week 5 | 2.1 | 2.2 | <0.2 | 142 | 5.5 | 100 | 11.5 | 9.3 | |
| | | Termination | 1.9 | 2.0 | <0.2 | 146 | 4.6 | 105 | 9.9 | 7.0 | |
| | 3003 | Week 5 | 2.0 | 2.1 | <0.2 | 143 | 4.9 | 101 | 11.6 | 7.8 | |
| | | Termination | 2.2 | 1.7 | <0.2 | 146 | 4.9 | 103 | 10.4 | 7.7 | |
| | 3004 | Week 5 | 2.1 | 2.0 | <0.2 | 143 | 5.0 | 100 | 11.9 | 8.3 | |
| | | Termination | 2.1 | 1.7 | <0.2 | 145 | 5.2 | 102 | 10.1 | 7.0 | |

APPENDIX 12 (cont) Clinical chemistry - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | AST U/L | ALT U/L | ALKP U/L | BUN mg/dL | CREAT mg/dL | GLU mg/dL | CHOL mg/dL | TRIG mg/dL | TP g/dL | ALB g/dL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3M | 3005 | Week 5 | 109 | 52 | 251 | 17 | 0.2 | 85 | 72 | 64 | 5.9 | 4.0 |
| | | Termination | 82 | 31 | 76 | 14 | 0.3 | 118 | 53 | 36 | 5.6 | 3.7 |
| | 3006 | Week 5 | 96 | 70 | 266 | 21 | 0.2 | 94 | 119 | 122 | 7.0 | 4.6 |
| | | Termination | 88 | 33 | 88 | 13 | 0.2 | 158 | 114 | 222 | 6.7 | 4.2 |
| | 3007 | Week 5 | 113 | 54 | 224 | 15 | 0.2 | 86 | 94 | 149 | 6.1 | 4.0 |
| | | Termination | 80 | 28 | 74 | 17 | 0.3 | 122 | 76 | 113 | 6.1 | 3.9 |
| | 3008 | Week 5 | 107 | 56 | 293 | 15 | 0.2 | 89 | 80 | 98 | 6.6 | 4.4 |
| | | Termination | 78 | 26 | 83 | 15 | 0.3 | 139 | 53 | 63 | 5.5 | 3.5 |
| | 3009 | Week 5 | 115 | 62 | 202 | 16 | 0.2 | 99 | 85 | 63 | 6.3 | 4.2 |
| | | Termination | 69 | 32 | 85 | 13 | 0.3 | 118 | 59 | 43 | 5.8 | 3.7 |
| | 3010 | Week 5 | 102 | 69 | 272 | 14 | 0.2 | 98 | 102 | 99 | 6.1 | 4.1 |
| | | Termination | 71 | 38 | 92 | 13 | 0.3 | 119 | 76 | 56 | 5.9 | 3.8 |
| 4M | 4001 | Week 5 | 139 | 60 | 252 | 16 | 0.3 | 81 | 93 | 82 | 6.3 | 4.3 |
| | | Termination | 107 | 45 | 103 | 15 | 0.3 | 95 | 72 | 35 | 6.0 | 3.9 |
| | 4002 | Week 5 | 121 | 70 | 250 | 19 | 0.3 | 81 | 107 | 143 | 7.0 | 4.5 |
| | | Termination | 91 | 41 | 73 | 16 | 0.4 | 110 | 71 | 74 | 6.1 | 3.8 |

APPENDIX 12 (cont) Clinical chemistry - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | Glob g/dL | A/G | TBILI mg/dL | Na+ mEq/L | K+ mEq/L | Cl- mEq/L | Ca++ mg/dL | PHOS mg/dL | SCD1 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3M | 3005 | Week 5 | 1.9 | 2.1 | <0.2 | 142 | 5.5 | 101 | 11.6 | 9.1 | |
| | | Termination | 1.9 | 1.9 | <0.2 | 146 | 5.1 | 104 | 10.3 | 7.7 | |
| | 3006 | Week 5 | 2.4 | 1.9 | <0.2 | 143 | 5.0 | 99 | 12.5 | 9.7 | |
| | | Termination | 2.5 | 1.7 | <0.2 | 144 | 5.3 | 102 | 10.6 | 7.2 | |
| | 3007 | Week 5 | 2.1 | 1.9 | <0.2 | 141 | 5.5 | 98 | 11.2 | 9.2 | |
| | | Termination | 2.2 | 1.8 | <0.2 | 147 | 4.5 | 105 | 10.8 | 7.2 | |
| | 3008 | Week 5 | 2.2 | 2.0 | <0.2 | 142 | 4.8 | 99 | 11.6 | 8.5 | |
| | | Termination | 2.0 | 1.8 | <0.2 | 145 | 4.9 | 105 | 10.4 | 6.9 | |
| | 3009 | Week 5 | 2.1 | 2.0 | <0.2 | 141 | 5.4 | 99 | 11.5 | 9.3 | |
| | | Termination | 2.1 | 1.8 | <0.2 | 145 | 4.9 | 103 | 10.3 | 7.2 | |
| | 3010 | Week 5 | 2.0 | 2.1 | <0.2 | 143 | 4.8 | 102 | 11.4 | 8.7 | |
| | | Termination | 2.1 | 1.8 | <0.2 | 145 | 4.5 | 104 | 10.3 | 6.7 | |
| 4M | 4001 | Week 5 | 2.0 | 2.2 | <0.2 | 142 | 6.0 | 99 | 11.3 | 10.0 | |
| | | Termination | 2.1 | 1.9 | <0.2 | 145 | 4.7 | 103 | 10.2 | 8.0 | |
| | 4002 | Week 5 | 2.5 | 1.8 | <0.2 | 142 | 4.6 | 96 | 11.3 | 9.6 | |
| | | Termination | 2.3 | 1.7 | <0.2 | 144 | 4.8 | 101 | 10.3 | 7.7 | |

APPENDIX 12 (cont) Clinical chemistry - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | AST U/L | ALT U/L | ALKP U/L | BUN mg/dL | CREAT mg/dL | GLU mg/dL | CHOL mg/dL | TRIG mg/dL | TP g/dL | ALB g/dL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4M | 4003 | Week 5 | 100 | 62 | 205 | 16 | 0.2 | 106 | 105 | 140 | 6.5 | 4.2 |
| | | Termination | 88 | 38 | 69 | 18 | 0.3 | 154 | 95 | 83 | 6.5 | 4.0 |
| | 4004 | Week 5 | 120 | 60 | 241 | 17 | 0.2 | 85 | 89 | 73 | 6.8 | 4.5 |
| | | Termination | 153 | 54 | 88 | 17 | 0.3 | 113 | 54 | 44 | 6.0 | 3.8 |
| | 4005 | Week 5 | 118 | 63 | 204 | 15 | 0.2 | 86 | 83 | 66 | 6.3 | 4.2 |
| | | Termination | 84 | 37 | 67 | 13 | 0.3 | 152 | 64 | 111 | 6.2 | 4.0 |
| | 4006 | Week 5 | 110 | 71 | 260 | 17 | 0.3 | 99 | 81 | 64 | 7.0 | 4.5 |
| | | Termination | 73 | 34 | 75 | 14 | 0.3 | 150 | 55 | 55 | 6.3 | 3.9 |
| | 4007 | Week 5 | 90 | 55 | 325 | 18 | 0.2 | 82 | 108 | 132 | 6.2 | 4.2 |
| | | Termination | 88 | 30 | 97 | 16 | 0.2 | 120 | 80 | 58 | 6.0 | 3.8 |
| | 4008 | Week 5 | 108 | 50 | 167 | 14 | 0.2 | 74 | 70 | 64 | 5.8 | 3.7 |
| | | Termination | 93 | 40 | 65 | 15 | 0.2 | 102 | 55 | 23 | 5.6 | 3.4 |
| | 4009 | Week 5 | 91 | 53 | 236 | 17 | 0.2 | 95 | 85 | 166 | 6.3 | 4.3 |
| | | Termination | 72 | 25 | 82 | 14 | 0.2 | 129 | 62 | 88 | 5.8 | 3.6 |
| | 4010 | Week 5 | 109 | 50 | 213 | 16 | 0.3 | 88 | 77 | 96 | 6.4 | 4.2 |
| | | Termination | 103 | 35 | 78 | 15 | 0.3 | 130 | 55 | 98 | 6.0 | 3.6 |

APPENDIX 12 (cont) Clinical chemistry - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | Glob g/dL | A/G | TBILI mg/dL | Na+ mEq/L | K+ mEq/L | Cl- mEq/L | Ca++ mg/dL | PHOS mg/dL | SCD1 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4M | 4003 | Week 5 | 2.3 | 1.8 | <0.2 | 140 | 4.9 | 99 | 11.5 | 8.3 | |
| | | Termination | 2.5 | 1.6 | <0.2 | 144 | 5.0 | 102 | 10.3 | 7.2 | |
| | 4004 | Week 5 | 2.3 | 2.0 | <0.2 | 143 | 5.1 | 101 | 11.4 | 8.9 | |
| | | Termination | 2.2 | 1.7 | <0.2 | 145 | 5.3 | 103 | 10.5 | 7.6 | |
| | 4005 | Week 5 | 2.1 | 2.0 | <0.2 | 142 | 5.3 | 100 | 11.6 | 8.9 | |
| | | Termination | 2.2 | 1.8 | <0.2 | 144 | 5.1 | 101 | 11.3 | 6.9 | |
| | 4006 | Week 5 | 2.5 | 1.8 | <0.2 | 141 | 5.5 | 98 | 11.7 | 8.7 | |
| | | Termination | 2.4 | 1.6 | <0.2 | 144 | 5.5 | 103 | 10.9 | 6.3 | |
| | 4007 | Week 5 | 2.0 | 2.1 | <0.2 | 135 | 5.4 | 97 | 11.2 | 8.5 | |
| | | Termination | 2.2 | 1.7 | <0.2 | 145 | 5.4 | 104 | 11.3 | 7.1 | |
| | 4008 | Week 5 | 2.1 | 1.8 | <0.2 | 149 | 4.6 | 105 | 11.1 | 7.5 | |
| | | Termination | 2.2 | 1.5 | <0.2 | 145 | 4.9 | 105 | 9.8 | 7.1 | |
| | 4009 | Week 5 | 2.0 | 2.2 | <0.2 | 142 | 5.6 | 100 | 11.2 | 9.1 | |
| | | Termination | 2.2 | 1.6 | <0.2 | 145 | 4.9 | 105 | 10.1 | 7.4 | |
| | 4010 | Week 5 | 2.2 | 1.9 | <0.2 | 142 | 5.4 | 101 | 10.4 | 8.4 | |
| | | Termination | 2.4 | 1.5 | <0.2 | 145 | 5.4 | 104 | 10.3 | 7.1 | |

APPENDIX 12 (cont) Clinical chemistry - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | AST U/L | ALT U/L | ALKP U/L | BUN mg/dL | CREAT mg/dL | GLU mg/dL | CHOL mg/dL | TRIG mg/dL | TP g/dL | ALB g/dL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | 1501 | Week 5 | 126 | 46 | 131 | 14 | 0.2 | 114 | 109 | 54 | 6.9 | 4.5 |
| | | Termination | 280 | 100 | 66 | 18 | 0.4 | 136 | 101 | 58 | 6.9 | 4.4 |
| | 1502 | Week 5 | 114 | 55 | 153 | 22 | 0.3 | 92 | 109 | 70 | 7.1 | 4.9 |
| | | Termination | 103 | 46 | 52 | 22 | 0.5 | 121 | 115 | 92 | 7.6 | 4.9 |
| | 1503 | Week 5 | 92 | 40 | 150 | 19 | 0.3 | 91 | 119 | 48 | 6.9 | 4.5 |
| | | Termination | 99 | 31 | 60 | 19 | 0.4 | 124 | 112 | 70 | 7.3 | 4.5 |
| | 1504 | Week 5 | 126 | 45 | 102 | 26 | 0.4 | 91 | 116 | 60 | 7.9 | 5.2 |
| | | Termination | 147 | 56 | 53 | 19 | 0.4 | 117 | 95 | 89 | 7.3 | 4.7 |
| | 1505 | Week 5 | 91 | 52 | 190 | 18 | 0.3 | 119 | 110 | 60 | 6.5 | 4.3 |
| | | Termination | 102 | 41 | 91 | 21 | 0.4 | 110 | 97 | 101 | 6.4 | 4.1 |
| | 1506 | Week 5 | 148 | 45 | 148 | 27 | 0.3 | 113 | 100 | 78 | 6.9 | 4.6 |
| | | Termination | 164 | 43 | 61 | 26 | 0.4 | 101 | 82 | 79 | 6.7 | 4.2 |
| | 1507 | Week 5 | 127 | 67 | 146 | 31 | 0.3 | 107 | 102 | 101 | 7.3 | 4.8 |
| | | Termination | 65 | 30 | 39 | 19 | 0.2 | 116 | 91 | 77 | 6.9 | 4.2 |
| | 1508 | Week 5 | 83 | 62 | 169 | 25 | 0.2 | 99 | 97 | 67 | 6.4 | 4.3 |
| | | Termination | 61 | 27 | 49 | 16 | 0.3 | 114 | 103 | 96 | 7.0 | 4.6 |

APPENDIX 12 (cont) Clinical chemistry - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | Glob g/dL | A/G | TBILI mg/dL | Na+ mEq/L | K+ mEq/L | Cl- mEq/L | Ca++ mg/dL | PHOS mg/dL | SCD1 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | 1501 | Week 5 | 2.4 | 1.9 | <0.2 | 142 | 4.7 | 101 | 10.8 | 7.2 | |
| | | Termination | 2.5 | 1.8 | <0.2 | 141 | 3.7 | 104 | 9.8 | 4.3 | |
| | 1502 | Week 5 | 2.2 | 2.2 | <0.2 | 141 | 5.2 | 97 | 11.8 | 7.9 | |
| | | Termination | 2.7 | 1.8 | <0.2 | 143 | 4.3 | 102 | 10.5 | 4.6 | |
| | 1503 | Week 5 | 2.4 | 1.9 | <0.2 | 142 | 4.3 | 101 | 11.2 | 7.5 | |
| | | Termination | 2.8 | 1.6 | <0.2 | 143 | 4.2 | 102 | 10.0 | 4.9 | |
| | 1504 | Week 5 | 2.7 | 1.9 | <0.2 | 143 | 5.2 | 102 | 11.3 | 7.7 | |
| | | Termination | 2.6 | 1.8 | <0.2 | 144 | 4.3 | 104 | 10.4 | 4.5 | |
| | 1505 | Week 5 | 2.2 | 2.0 | <0.2 | 144 | 5.0 | 102 | 10.9 | 6.8 | |
| | | Termination | 2.3 | 1.8 | <0.2 | 143 | 3.9 | 103 | 9.7 | 4.7 | |
| | 1506 | Week 5 | 2.3 | 2.0 | <0.2 | 142 | 5.2 | 102 | 11.0 | 7.6 | |
| | | Termination | 2.5 | 1.7 | <0.2 | 145 | 4.4 | 102 | 10.3 | 7.9 | |
| | 1507 | Week 5 | 2.5 | 1.9 | <0.2 | 142 | 5.1 | 100 | 11.6 | 8.1 | |
| | | Termination | 2.7 | 1.6 | <0.2 | 143 | 4.5 | 103 | 10.6 | 6.5 | |
| | 1508 | Week 5 | 2.1 | 2.0 | <0.2 | 141 | 4.4 | 99 | 11.1 | 7.6 | |
| | | Termination | 2.4 | 1.9 | <0.2 | 144 | 4.3 | 104 | 10.8 | 6.2 | |

APPENDIX 12 (cont) Clinical chemistry - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | AST U/L | ALT U/L | ALKP U/L | BUN mg/dL | CREAT mg/dL | GLU mg/dL | CHOL mg/dL | TRIG mg/dL | TP g/dL | ALB g/dL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | 1509 | Week 5 | 113 | 56 | 186 | 18 | 0.3 | 101 | 96 | 72 | 6.6 | 4.5 |
| | | Termination | 80 | 31 | 61 | 15 | 0.3 | 108 | 78 | 71 | 6.4 | 4.1 |
| | 1510 | Week 5 | 120 | 55 | 205 | 17 | 0.2 | 92 | 121 | 66 | 6.2 | 4.4 |
| | | Termination | 107 | 32 | 62 | 15 | 0.3 | 170 | 122 | 90 | 6.6 | 4.4 |
| 2F | 2501 | Week 5 | 85 | 55 | 137 | 18 | 0.2 | 98 | 82 | 46 | 5.9 | 3.9 |
| | | Termination | 101 | 30 | 39 | 16 | 0.4 | 105 | 76 | 47 | 6.3 | 4.1 |
| | 2502 | Week 5 | 102 | 76 | 142 | 25 | 0.3 | 90 | 64 | 54 | 7.0 | 4.8 |
| | | Termination | 138 | 63 | 56 | 18 | 0.3 | 99 | 72 | 76 | 6.7 | 4.3 |
| | 2503 | Week 5 | 121 | 58 | 191 | 24 | 0.3 | 97 | 79 | 60 | 6.6 | 4.4 |
| | | Termination | 157 | 55 | 68 | 17 | 0.3 | 108 | 89 | 64 | 6.7 | 4.4 |
| | 2504 | Week 5 | 112 | 74 | 227 | 16 | 0.2 | 105 | 61 | 86 | 6.2 | 4.3 |
| | | Termination | 103 | 34 | 65 | 14 | 0.3 | 107 | 52 | 56 | 6.1 | 4.0 |
| | 2505 | Week 5 | 91 | 51 | 97 | 20 | 0.2 | 95 | 88 | 68 | 6.3 | 4.3 |
| | | Termination | 159 | 38 | 34 | 19 | 0.3 | 106 | 81 | 69 | 6.6 | 4.2 |
| | 2506 | Week 5 | 165 | 62 | 163 | 20 | 0.3 | 91 | 120 | 81 | 7.0 | 4.6 |
| | | Termination | 144 | 40 | 49 | 18 | 0.3 | 95 | 108 | 75 | 6.8 | 4.3 |

APPENDIX 12 (cont) Clinical chemistry - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | Glob g/dL | A/G | TBILI mg/dL | Na+ mEq/L | K+ mEq/L | Cl- mEq/L | Ca++ mg/dL | PHOS mg/dL | SCD1 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1F | 1509 | Week 5 | 2.1 | 2.1 | <0.2 | 142 | 4.7 | 99 | 11.0 | 8.0 | |
| | | Termination | 2.3 | 1.8 | <0.2 | 142 | 4.8 | 102 | 10.7 | 7.2 | |
| | 1510 | Week 5 | 1.8 | 2.4 | <0.2 | 140 | 5.1 | 100 | 10.7 | 8.1 | |
| | | Termination | 2.2 | 2.0 | <0.2 | 141 | 4.9 | 102 | 10.2 | 6.4 | |
| 2F | 2501 | Week 5 | 2.0 | 2.0 | <0.2 | 143 | 4.7 | 102 | 10.8 | 7.9 | |
| | | Termination | 2.2 | 1.9 | <0.2 | 144 | 4.5 | 105 | 10.2 | 7.4 | |
| | 2502 | Week 5 | 2.2 | 2.2 | <0.2 | 142 | 5.4 | 101 | 11.6 | 9.0 | |
| | | Termination | 2.4 | 1.8 | <0.2 | 144 | 4.7 | 103 | 10.3 | 7.7 | |
| | 2503 | Week 5 | 2.2 | 2.0 | <0.2 | 141 | 5.5 | 101 | 11.3 | 8.3 | |
| | | Termination | 2.3 | 1.9 | <0.2 | 143 | 4.4 | 103 | 10.3 | 7.4 | |
| | 2504 | Week 5 | 1.9 | 2.3 | <0.2 | 140 | 5.1 | 100 | 10.8 | 8.0 | |
| | | Termination | 2.1 | 1.9 | <0.2 | 141 | 4.8 | 101 | 10.5 | 8.0 | |
| | 2505 | Week 5 | 2.0 | 2.2 | <0.2 | 143 | 5.0 | 101 | 11.6 | 7.6 | |
| | | Termination | 2.4 | 1.8 | <0.2 | 143 | 4.7 | 103 | 10.4 | 6.8 | |
| | 2506 | Week 5 | 2.4 | 1.9 | <0.2 | 142 | 5.9 | 101 | 11.5 | 8.6 | |
| | | Termination | 2.5 | 1.7 | <0.2 | 144 | 4.4 | 101 | 11.0 | 6.7 | |

APPENDIX 12 (cont) Clinical chemistry - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | AST U/L | ALT U/L | ALKP U/L | BUN mg/dL | CREAT mg/dL | GLU mg/dL | CHOL mg/dL | TRIG mg/dL | TP g/dL | ALB g/dL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2F | 2507 | Week 5 | 111 | 68 | 123 | 25 | 0.4 | 130 | 94 | 52 | 6.8 | 4.5 |
| | | Termination | 99 | 50 | 35 | 16 | 0.3 | 174 | 81 | 52 | 6.5 | 4.2 |
| | 2508 | Week 5 | 161 | 61 | 124 | 26 | 0.3 | 100 | 115 | 82 | 7.2 | 4.9 |
| | | Termination | 169 | 33 | 33 | 18 | 0.3 | 99 | 103 | 83 | 7.0 | 4.6 |
| | 2509 | Week 5 | 178 | 78 | 116 | 24 | 0.3 | 86 | 100 | 100 | 6.5 | 4.5 |
| | | Termination | 111 | 27 | 28 | 19 | 0.5 | 133 | 80 | 83 | 6.5 | 4.1 |
| | 2510 | Week 5 | 128 | 54 | 140 | 23 | 0.3 | 94 | 94 | 79 | 6.3 | 4.4 |
| | | Termination | 97 | 26 | 50 | 16 | 0.3 | 102 | 89 | 75 | 6.5 | 4.2 |
| 3F | 3501 | Week 5 | 88 | 69 | 161 | 25 | 0.2 | 94 | 79 | 124 | 6.9 | 4.7 |
| | | Termination | 99 | 50 | 68 | 21 | 0.3 | 113 | 71 | 121 | 6.9 | 4.5 |
| | 3502 | Week 5 | 87 | 48 | 179 | 16 | 0.3 | 109 | 80 | 80 | 6.7 | 4.4 |
| | | Termination | 92 | 30 | 68 | 21 | 0.5 | 118 | 69 | 90 | 7.1 | 4.5 |
| | 3503 | Week 5 | 101 | 59 | 106 | 13 | 0.2 | 106 | 109 | 100 | 6.8 | 4.8 |
| | | Termination | 130 | 33 | 43 | 16 | 0.4 | 109 | 111 | 80 | 7.2 | 4.9 |
| | 3504 | Week 5 | 92 | 57 | 126 | 15 | 0.2 | 103 | 93 | 59 | 7.0 | 4.7 |
| | | Termination | 116 | 41 | 48 | 14 | 0.3 | 120 | 97 | 74 | 7.0 | 4.4 |

APPENDIX 12 (cont) Clinical chemistry - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | Glob g/dL | A/G | TBILI mg/dL | Na+ mEq/L | K+ mEq/L | Cl- mEq/L | Ca++ mg/dL | PHOS mg/dL | SCD1 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2F | 2507 | Week 5 | 2.3 | 2.0 | <0.2 | 141 | 5.3 | 102 | 11.3 | 8.2 | |
| | | Termination | 2.3 | 1.8 | <0.2 | 142 | 4.4 | 102 | 10.7 | 7.0 | |
| | 2508 | Week 5 | 2.3 | 2.1 | <0.2 | 142 | 5.4 | 101 | 12.0 | 7.7 | |
| | | Termination | 2.4 | 1.9 | <0.2 | 144 | 4.5 | 102 | 11.1 | 6.6 | |
| | 2509 | Week 5 | 2.0 | 2.3 | <0.2 | 141 | 5.1 | 100 | 11.5 | 9.2 | |
| | | Termination | 2.4 | 1.7 | <0.2 | 141 | 4.5 | 102 | 10.3 | 7.1 | |
| | 2510 | Week 5 | 1.9 | 2.3 | <0.2 | 142 | 5.8 | 100 | 12.1 | 8.8 | |
| | | Termination | 2.3 | 1.8 | <0.2 | 143 | 4.7 | 105 | 10.5 | 6.1 | |
| 3F | 3501 | Week 5 | 2.2 | 2.1 | <0.2 | 140 | 5.0 | 97 | 10.9 | 8.0 | |
| | | Termination | 2.4 | 1.9 | <0.2 | 142 | 4.7 | 102 | 11.1 | 7.1 | |
| | 3502 | Week 5 | 2.3 | 1.9 | <0.2 | 142 | 5.2 | 101 | 11.2 | 7.8 | |
| | | Termination | 2.6 | 1.7 | <0.2 | 142 | 4.3 | 102 | 10.4 | 5.8 | |
| | 3503 | Week 5 | 2.0 | 2.4 | <0.2 | 142 | 5.0 | 102 | 11.4 | 6.5 | |
| | | Termination | 2.3 | 2.1 | <0.2 | 142 | 4.6 | 102 | 10.7 | 7.5 | |
| | 3504 | Week 5 | 2.3 | 2.0 | <0.2 | 141 | 5.3 | 99 | 11.9 | 7.6 | |
| | | Termination | 2.6 | 1.7 | <0.2 | 142 | 4.5 | 102 | 11.0 | 6.8 | |

APPENDIX 12 (cont) Clinical chemistry - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | AST U/L | ALT U/L | ALKP U/L | BUN mg/dL | CREAT mg/dL | GLU mg/dL | CHOL mg/dL | TRIG mg/dL | TP g/dL | ALB g/dL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3F | 3505 | Week 5 | 142 | 42 | 127 | 23 | 0.4 | 105 | 104 | 53 | 6.8 | 4.6 |
| | | Termination | 144 | 29 | 40 | 25 | 0.5 | 121 | 93 | 82 | 7.0 | 4.5 |
| | 3506 | Week 5 | 118 | 59 | 177 | 16 | 0.3 | 100 | 108 | 88 | 7.0 | 4.7 |
| | | Termination | 133 | 31 | 54 | 16 | 0.3 | 117 | 97 | 57 | 7.2 | 4.6 |
| | 3507 | Week 5 | 99 | 52 | 136 | 15 | 0.3 | 108 | 115 | 101 | 6.9 | 4.5 |
| | | Termination | 109 | 27 | 34 | 15 | 0.3 | 131 | 105 | 82 | 7.3 | 4.7 |
| | 3508 | Week 5 | 102 | 60 | 133 | 20 | 0.2 | 100 | 102 | 124 | 6.6 | 4.5 |
| | | Termination | 110 | 30 | 49 | 14 | 0.3 | 127 | 91 | 107 | 6.4 | 4.1 |
| | 3509 | Week 5 | 150 | 52 | 144 | 18 | 0.2 | 109 | 98 | 109 | 6.8 | 4.7 |
| | | Termination | 139 | 23 | 43 | 16 | 0.3 | 96 | 91 | 88 | 6.9 | 4.4 |
| | 3510 | Week 5 | 124 | 45 | 135 | 19 | 0.2 | 97 | 84 | 57 | 6.5 | 4.4 |
| | | Termination | 74 | 24 | 38 | 16 | 0.3 | 118 | 88 | 76 | 7.0 | 4.4 |
| 4F | 4501 | Week 5 | 116 | 49 | 131 | 23 | 0.3 | 91 | 99 | 72 | 6.8 | 4.6 |
| | | Termination | 119 | 33 | 49 | 18 | 0.5 | 123 | 88 | 86 | 6.6 | 4.1 |
| | 4502 | Week 5 | 129 | 45 | 126 | 19 | 0.3 | 86 | 126 | 56 | 6.7 | 4.5 |
| | | Termination | 106 | 38 | 58 | 21 | 0.4 | 137 | 92 | 68 | 6.2 | 4.0 |

APPENDIX 12 (cont) Clinical chemistry - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | Glob g/dL | A/G | TBILI mg/dL | Na+ mEq/L | K+ mEq/L | Cl- mEq/L | Ca++ mg/dL | PHOS mg/dL | SCD1 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3F | 3505 | Week 5 | 2.2 | 2.1 | <0.2 | 143 | 5.1 | 103 | 11.0 | 7.2 | |
| | | Termination | 2.5 | 1.8 | <0.2 | 142 | 4.1 | 101 | 10.8 | 6.8 | |
| | 3506 | Week 5 | 2.3 | 2.0 | <0.2 | 142 | 5.5 | 101 | 11.8 | 8.3 | |
| | | Termination | 2.6 | 1.8 | <0.2 | 142 | 4.6 | 102 | 11.1 | 7.3 | |
| | 3507 | Week 5 | 2.4 | 1.9 | <0.2 | 141 | 5.2 | 99 | 11.7 | 8.0 | |
| | | Termination | 2.6 | 1.8 | <0.2 | 143 | 4.7 | 102 | 10.7 | 5.7 | |
| | 3508 | Week 5 | 2.1 | 2.1 | <0.2 | 141 | 5.0 | 98 | 11.6 | 7.3 | |
| | | Termination | 2.3 | 1.8 | <0.2 | 141 | 4.9 | 101 | 10.7 | 7.1 | |
| | 3509 | Week 5 | 2.1 | 2.2 | <0.2 | 141 | 5.3 | 100 | 11.6 | 8.2 | |
| | | Termination | 2.5 | 1.8 | <0.2 | 143 | 4.5 | 102 | 10.8 | 6.8 | |
| | 3510 | Week 5 | 2.1 | 2.1 | <0.2 | 141 | 5.1 | 98 | 11.2 | 8.2 | |
| | | Termination | 2.6 | 1.7 | <0.2 | 142 | 4.4 | 102 | 11.2 | 6.4 | |
| 4F | 4501 | Week 5 | 2.2 | 2.1 | <0.2 | 141 | 4.7 | 99 | 11.6 | 8.6 | |
| | | Termination | 2.5 | 1.6 | <0.2 | 142 | 4.4 | 103 | 10.4 | 6.2 | |
| | 4502 | Week 5 | 2.2 | 2.0 | <0.2 | 141 | 5.0 | 100 | 11.1 | 8.1 | |
| | | Termination | 2.2 | 1.8 | <0.2 | 142 | 4.4 | 102 | 10.6 | 5.4 | |

APPENDIX 12 (cont) Clinical chemistry - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | AST U/L | ALT U/L | ALKP U/L | BUN mg/dL | CREAT mg/dL | GLU mg/dL | CHOL mg/dL | TRIG mg/dL | TP g/dL | ALB g/dL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4F | 4503 | Week 5 | 149 | 55 | 126 | 21 | 0.3 | 97 | 83 | 58 | 6.9 | 4.6 |
| | | Termination | 119 | 28 | 44 | 19 | 0.4 | 112 | 85 | 45 | 6.8 | 4.4 |
| | 4504 | Week 5 | 105 | 65 | 184 | 21 | 0.3 | 97 | 114 | 85 | 7.0 | 4.7 |
| | | Termination | 114 | 48 | 66 | 20 | 0.3 | 143 | 93 | 64 | 6.9 | 4.3 |
| | 4505 | Week 5 | 190 | 65 | 154 | 19 | 0.3 | 95 | 68 | 64 | 5.8 | 3.9 |
| | | Termination | 118 | 39 | 59 | 14 | 0.3 | 104 | 74 | 55 | 6.8 | 4.4 |
| | 4506 | Week 5 | 150 | 63 | 169 | 24 | 0.3 | 103 | 73 | 94 | 6.3 | 4.3 |
| | | Termination | 121 | 43 | 62 | 17 | 0.3 | 95 | 68 | 85 | 6.4 | 4.0 |
| | 4507 | Week 5 | 102 | 48 | 118 | 22 | 0.3 | 93 | 97 | 54 | 6.6 | 4.4 |
| | | Termination | 137 | 32 | 34 | 14 | 0.2 | 105 | 82 | 46 | 6.4 | 4.1 |
| | 4508 | Week 5 | 133 | 73 | 153 | 30 | 0.3 | 93 | 97 | 101 | 7.2 | 4.9 |
| | | Termination | 142 | 58 | 42 | 19 | 0.2 | 117 | 78 | 79 | 6.7 | 4.3 |
| | 4509 | Week 5 | 151 | 76 | 201 | 25 | 0.3 | 95 | 99 | 81 | 7.2 | 4.9 |
| | | Termination | 88 | 45 | 46 | 14 | 0.2 | 112 | 87 | 123 | 6.9 | 4.7 |
| | 4510 | Week 5 | 105 | 40 | 139 | 18 | 0.3 | 94 | 103 | 83 | 7.1 | 4.8 |
| | | Termination | 83 | 26 | 42 | 14 | 0.3 | 125 | 82 | 113 | 7.2 | 4.6 |

APPENDIX 12 (cont) Clinical chemistry - individual values

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Occasion | Glob g/dL | A/G | TBILI mg/dL | Na+ mEq/L | K+ mEq/L | Cl- mEq/L | Ca++ mg/dL | PHOS mg/dL | SCD1 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4F | 4503 | Week 5 | 2.3 | 2.0 | <0.2 | 141 | 5.4 | 100 | 10.9 | 8.5 | |
| | | Termination | 2.4 | 1.8 | <0.2 | 143 | 4.2 | 104 | 10.5 | 6.4 | |
| | 4504 | Week 5 | 2.3 | 2.0 | <0.2 | 142 | 4.6 | 99 | 11.3 | 8.2 | |
| | | Termination | 2.6 | 1.7 | <0.2 | 143 | 4.5 | 103 | 10.4 | 6.9 | |
| | 4505 | Week 5 | 1.9 | 2.1 | <0.2 | 141 | 5.6 | 101 | 10.4 | 7.6 | |
| | | Termination | 2.4 | 1.8 | <0.2 | 143 | 4.0 | 102 | 10.8 | 5.6 | |
| | 4506 | Week 5 | 2.0 | 2.2 | <0.2 | 141 | 5.8 | 101 | 11.3 | 8.2 | |
| | | Termination | 2.4 | 1.7 | <0.2 | 143 | 4.6 | 102 | 10.3 | 7.7 | |
| | 4507 | Week 5 | 2.2 | 2.0 | <0.2 | 142 | 4.9 | 102 | 11.7 | 7.1 | |
| | | Termination | 2.3 | 1.8 | <0.2 | 143 | 4.8 | 101 | 10.4 | 6.6 | |
| | 4508 | Week 5 | 2.3 | 2.1 | <0.2 | 142 | 5.4 | 99 | 12.2 | 8.8 | |
| | | Termination | 2.4 | 1.8 | <0.2 | 143 | 4.8 | 101 | 10.9 | 7.7 | |
| | 4509 | Week 5 | 2.3 | 2.1 | <0.2 | 141 | 5.0 | 98 | 11.5 | 8.6 | |
| | | Termination | 2.2 | 2.1 | <0.2 | 144 | 4.3 | 100 | 11.2 | 5.7 | |
| | 4510 | Week 5 | 2.3 | 2.1 | <0.2 | 142 | 5.1 | 100 | 12.0 | 8.7 | |
| | | Termination | 2.6 | 1.8 | <0.2 | 143 | 4.6 | 103 | 11.2 | 6.0 | |

APPENDIX 13 Organ weights - individual values (g) - terminal sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Terminal Body weight | Adrenals | Adrenals Body (%) | Adrenals Brain (%) | Brain | Brain Body (%) | Epididymides | Epididymides Body (%) | Epididymides Brain (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative to | | | | | | | | | | |
| 1M | 1001 | 475.9 | 0.0570 | 0.0120 | 2.54 | 2.2440 | 0.472 | 1.8330 | 0.385 | 81.7 |
| | 1002 | 555.7 | 0.0740 | 0.0133 | 3.28 | 2.2540 | 0.406 | 1.5370 | 0.277 | 68.2 |
| | 1003 | 456.1 | 0.0570 | 0.0125 | 2.48 | 2.2970 | 0.504 | 1.4150 | 0.310 | 61.6 |
| | 1004 | 426.9 | 0.0540 | 0.0126 | 2.71 | 1.9960 | 0.468 | 1.4600 | 0.342 | 73.1 |
| | 1005 | 594.7 | 0.0730 | 0.0123 | 3.33 | 2.1950 | 0.369 | 1.7330 | 0.291 | 79.0 |
| | 1006 | 487.5 | 0.0600 | 0.0123 | 2.55 | 2.3500 | 0.482 | 1.5990 | 0.328 | 68.0 |
| | 1007 | 473.9 | 0.0590 | 0.0124 | 2.78 | 2.1250 | 0.448 | 1.5380 | 0.325 | 72.4 |
| | 1008 | 439.8 | 0.0710 | 0.0161 | 3.27 | 2.1740 | 0.494 | 1.5700 | 0.357 | 72.2 |
| | 1009 | 504.4 | 0.0550 | 0.0109 | 2.57 | 2.1360 | 0.423 | 1.4600 | 0.289 | 68.4 |
| | 1010 | 459.3 | 0.0650 | 0.0142 | 3.19 | 2.0360 | 0.443 | 1.4650 | 0.319 | 72.0 |
| 2M | 2001 | 483.6 | 0.0660 | 0.0136 | 2.71 | 2.4320 | 0.503 | 1.9280 | 0.399 | 79.3 |
| | 2002 | 506.5 | 0.0580 | 0.0115 | 2.67 | 2.1740 | 0.429 | 1.3390 | 0.264 | 61.6 |
| | 2003 | 440.0 | 0.0690 | 0.0157 | 3.04 | 2.2720 | 0.516 | 1.6780 | 0.381 | 73.9 |
| | 2004 | 425.4 | 0.0560 | 0.0132 | 2.68 | 2.0930 | 0.492 | 1.3800 | 0.324 | 65.9 |
| | 2005 | 569.8 | 0.0460 | 0.0081 | 2.07 | 2.2240 | 0.390 | 1.7440 | 0.306 | 78.4 |
| | 2006 | 529.1 | 0.0630 | 0.0119 | 2.95 | 2.1340 | 0.403 | 1.6930 | 0.320 | 79.3 |
| | 2007 | 523.3 | 0.0660 | 0.0126 | 2.97 | 2.2240 | 0.425 | 1.8330 | 0.350 | 82.4 |
| | 2008 | 462.4 | 0.0600 | 0.0130 | 2.66 | 2.2580 | 0.488 | 1.4840 | 0.321 | 65.7 |
| | 2009 | 456.0 | 0.0570 | 0.0125 | 2.47 | 2.3120 | 0.507 | 1.5780 | 0.346 | 68.3 |
| | 2010 | 469.4 | 0.0690 | 0.0147 | 3.36 | 2.0540 | 0.438 | 1.5380 | 0.328 | 74.9 |

APPENDIX 13 (cont) Organ weights - individual values (g) - terminal sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Heart | Heart | Heart | Kidneys | Kidneys | Kidneys | Liver | Liver | Liver |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative to | | | Body (%) | Brain (%) | | Body (%) | Brain (%) | | Body (%) | Brain (%) |
| 1M | 1001 | 2.0130 | 0.423 | 89.7 | 2.6340 | 0.553 | 117 | 10.8550 | 2.28 | 484 |
| | 1002 | 1.5270 | 0.275 | 67.7 | 3.0290 | 0.545 | 134 | 12.5320 | 2.26 | 556 |
| | 1003 | 1.4980 | 0.328 | 65.2 | 2.5360 | 0.556 | 110 | 9.9520 | 2.18 | 433 |
| | 1004 | 1.2620 | 0.296 | 63.2 | 2.4180 | 0.566 | 121 | 9.1930 | 2.15 | 461 |
| | 1005 | 1.6430 | 0.276 | 74.9 | 3.2140 | 0.540 | 146 | 17.3170 | 2.91 | 789 |
| | 1006 | 1.6560 | 0.340 | 70.5 | 2.7270 | 0.559 | 116 | 10.7330 | 2.20 | 457 |
| | 1007 | 1.5640 | 0.330 | 73.6 | 4.2590 | 0.899 | 200 | 9.8400 | 2.08 | 463 |
| | 1008 | 1.5590 | 0.354 | 71.7 | 3.1590 | 0.718 | 145 | 10.3860 | 2.36 | 478 |
| | 1009 | 1.4420 | 0.286 | 67.5 | 2.8020 | 0.556 | 131 | 10.5930 | 2.10 | 496 |
| | 1010 | 1.5710 | 0.342 | 77.2 | 2.5840 | 0.563 | 127 | 9.2650 | 2.02 | 455 |
| 2M | 2001 | 2.0160 | 0.417 | 82.9 | 3.0550 | 0.632 | 126 | 10.9120 | 2.26 | 449 |
| | 2002 | 1.4770 | 0.292 | 67.9 | 3.0290 | 0.598 | 139 | 12.3850 | 2.45 | 570 |
| | 2003 | 1.5650 | 0.356 | 68.9 | 2.7450 | 0.624 | 121 | 9.2370 | 2.10 | 407 |
| | 2004 | 1.2420 | 0.292 | 59.3 | 2.8270 | 0.665 | 135 | 9.1570 | 2.15 | 438 |
| | 2005 | 1.7560 | 0.308 | 79.0 | 3.6110 | 0.634 | 162 | 13.7360 | 2.41 | 618 |
| | 2006 | 1.7540 | 0.332 | 82.2 | 3.6350 | 0.687 | 170 | 13.9230 | 2.63 | 652 |
| | 2007 | 1.9020 | 0.363 | 85.5 | 3.6050 | 0.689 | 162 | 12.3090 | 2.35 | 553 |
| | 2008 | 1.5390 | 0.333 | 68.2 | 2.7190 | 0.588 | 120 | 10.1520 | 2.20 | 450 |
| | 2009 | 1.3990 | 0.307 | 60.5 | 2.8490 | 0.625 | 123 | 10.2890 | 2.26 | 445 |
| | 2010 | 1.5150 | 0.323 | 73.8 | 2.4910 | 0.531 | 121 | 9.9550 | 2.12 | 485 |

APPENDIX 13 (cont) Organ weights - individual values (g) - terminal sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Lungs and Bronchi | Lungs and Bronchi | Lungs and Bronchi | Pituitary | Pituitary | Pituitary | Spleen | Spleen | Spleen |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative to | | | Body (%) | Brain (%) | | Body (%) | Brain (%) | | Body (%) | Brain (%) |
| 1M | 1001 | 1.5328 | 0.322 | 68.3 | 0.0142 | 0.0030 | 0.633 | 0.9880 | 0.208 | 44.0 |
| | 1002 | 1.7795 | 0.320 | 78.9 | 0.0155 | 0.0028 | 0.688 | 1.0310 | 0.186 | 45.7 |
| | 1003 | 1.7358 | 0.381 | 75.6 | 0.0146 | 0.0032 | 0.636 | 0.7900 | 0.173 | 34.4 |
| | 1004 | 1.4878 | 0.349 | 74.5 | 0.0132 | 0.0031 | 0.661 | 0.6490 | 0.152 | 32.5 |
| | 1005 | 1.8813 | 0.316 | 85.7 | 0.0128 | 0.0022 | 0.583 | 1.1130 | 0.187 | 50.7 |
| | 1006 | 1.7511 | 0.359 | 74.5 | 0.0153 | 0.0031 | 0.651 | 0.8360 | 0.171 | 35.6 |
| | 1007 | 1.5849 | 0.334 | 74.6 | 0.0134 | 0.0028 | 0.631 | 0.8810 | 0.186 | 41.5 |
| | 1008 | 1.6168 | 0.368 | 74.4 | 0.0128 | 0.0029 | 0.589 | 0.8340 | 0.190 | 38.4 |
| | 1009 | 1.6894 | 0.335 | 79.1 | 0.0148 | 0.0029 | 0.693 | 0.8280 | 0.164 | 38.8 |
| | 1010 | 1.7889 | 0.389 | 87.9 | 0.0147 | 0.0032 | 0.722 | 0.9540 | 0.208 | 46.9 |
| 2M | 2001 | 1.6330 | 0.338 | 67.1 | 0.0127 | 0.0026 | 0.522 | 1.0210 | 0.211 | 42.0 |
| | 2002 | 1.7626 | 0.348 | 81.1 | 0.0160 | 0.0032 | 0.736 | 0.6650 | 0.131 | 30.6 |
| | 2003 | 1.6387 | 0.372 | 72.1 | 0.0121 | 0.0028 | 0.533 | 0.9400 | 0.214 | 41.4 |
| | 2004 | 1.5651 | 0.368 | 74.8 | 0.0132 | 0.0031 | 0.631 | 0.6990 | 0.164 | 33.4 |
| | 2005 | 2.0474 | 0.359 | 92.1 | 0.0159 | 0.0028 | 0.715 | 1.0430 | 0.183 | 46.9 |
| | 2006 | 1.7464 | 0.330 | 81.8 | 0.0139 | 0.0026 | 0.651 | 1.1100 | 0.210 | 52.0 |
| | 2007 | 1.6272 | 0.311 | 73.2 | 0.0171 | 0.0033 | 0.769 | 0.7620 | 0.146 | 34.3 |
| | 2008 | 1.7520 | 0.379 | 77.6 | 0.0130 | 0.0028 | 0.576 | 0.7970 | 0.172 | 35.3 |
| | 2009 | 1.5952 | 0.350 | 69.0 | 0.0126 | 0.0028 | 0.545 | 0.7590 | 0.166 | 32.8 |
| | 2010 | 1.6195 | 0.345 | 78.8 | 0.0118 | 0.0025 | 0.574 | 0.8530 | 0.182 | 41.5 |

APPENDIX 13 (cont) Organ weights - individual values (g) - terminal sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Testes | Testes | Testes | Thymus | Thymus | Thymus | Thyroids and Parathyroids | Thyroids and Parathyroids | Thyroids and Parathyroids |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative to | | | Body (%) | Brain (%) | | Body (%) | Brain (%) | | Body (%) | Brain (%) |
| 1M | 1001 | 3.7660 | 0.791 | 168 | 0.3500 | 0.0735 | 15.6 | 0.0236 | 0.0050 | 1.05 |
| | 1002 | 3.1370 | 0.565 | 139 | 0.3720 | 0.0669 | 16.5 | 0.0273 | 0.0049 | 1.21 |
| | 1003 | 3.4600 | 0.759 | 151 | 0.5100 | 0.1118 | 22.2 | 0.0243 | 0.0053 | 1.06 |
| | 1004 | 3.5530 | 0.832 | 178 | 0.2710 | 0.0635 | 13.6 | 0.0168 | 0.0039 | 0.84 |
| | 1005 | 4.1220 | 0.693 | 188 | 0.3700 | 0.0622 | 16.9 | 0.0248 | 0.0042 | 1.13 |
| | 1006 | 3.8630 | 0.792 | 164 | 0.3490 | 0.0716 | 14.9 | 0.0240 | 0.0049 | 1.02 |
| | 1007 | 3.2510 | 0.686 | 153 | 0.6140 | 0.1296 | 28.9 | 0.0170 | 0.0036 | 0.80 |
| | 1008 | 3.6810 | 0.837 | 169 | 0.3560 | 0.0809 | 16.4 | 0.0222 | 0.0050 | 1.02 |
| | 1009 | 3.5190 | 0.698 | 165 | 0.5840 | 0.1158 | 27.3 | 0.0274 | 0.0054 | 1.28 |
| | 1010 | 3.1500 | 0.686 | 155 | 0.3660 | 0.0797 | 18.0 | 0.0158 | 0.0034 | 0.78 |
| 2M | 2001 | 4.2830 | 0.886 | 176 | 0.3200 | 0.0662 | 13.2 | 0.0246 | 0.0051 | 1.01 |
| | 2002 | 3.5960 | 0.710 | 165 | 0.4550 | 0.0898 | 20.9 | 0.0248 | 0.0049 | 1.14 |
| | 2003 | 3.7200 | 0.845 | 164 | 0.4450 | 0.1011 | 19.6 | 0.0170 | 0.0039 | 0.75 |
| | 2004 | 3.2640 | 0.767 | 156 | 0.2930 | 0.0689 | 14.0 | 0.0175 | 0.0041 | 0.84 |
| | 2005 | 3.7830 | 0.664 | 170 | 0.5220 | 0.0916 | 23.5 | 0.0269 | 0.0047 | 1.21 |
| | 2006 | 3.3940 | 0.641 | 159 | 0.4010 | 0.0758 | 18.8 | 0.0292 | 0.0055 | 1.37 |
| | 2007 | 3.4450 | 0.658 | 155 | 0.2900 | 0.0554 | 13.0 | 0.0274 | 0.0052 | 1.23 |
| | 2008 | 3.4110 | 0.738 | 151 | 0.4760 | 0.1029 | 21.1 | 0.0236 | 0.0051 | 1.05 |
| | 2009 | 3.0620 | 0.671 | 132 | 0.3180 | 0.0697 | 13.8 | 0.0248 | 0.0054 | 1.07 |
| | 2010 | 3.2880 | 0.700 | 160 | 0.5840 | 0.1244 | 28.4 | 0.0211 | 0.0045 | 1.03 |

APPENDIX 13 (cont) Organ weights - individual values (g) - terminal sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Prostate and Seminal Vesicles | Prostate and Seminal Vesicles | Prostate and Seminal Vesicles |
|---|---|---|---|---|
| Relative to | | | Body (%) | Brain (%) |
| 1M | 1001 | 4.0980 | 0.861 | 183 |
| | 1002 | 3.8450 | 0.692 | 171 |
| | 1003 | 3.0980 | 0.679 | 135 |
| | 1004 | 3.2560 | 0.763 | 163 |
| | 1005 | 3.5280 | 0.593 | 161 |
| | 1006 | 4.0210 | 0.825 | 171 |
| | 1007 | 2.9460 | 0.622 | 139 |
| | 1008 | 3.1790 | 0.723 | 146 |
| | 1009 | 4.2340 | 0.839 | 198 |
| | 1010 | 2.9450 | 0.641 | 145 |
| 2M | 2001 | 4.5980 | 0.951 | 189 |
| | 2002 | 3.4820 | 0.687 | 160 |
| | 2003 | 3.0750 | 0.699 | 135 |
| | 2004 | 3.4090 | 0.801 | 163 |
| | 2005 | 4.0920 | 0.718 | 184 |
| | 2006 | 3.4570 | 0.653 | 162 |
| | 2007 | 3.7350 | 0.714 | 168 |
| | 2008 | 3.7310 | 0.807 | 165 |
| | 2009 | 3.3360 | 0.732 | 144 |
| | 2010 | 3.6670 | 0.781 | 179 |

APPENDIX 13 (cont) Organ weights - individual values (g) - terminal sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Terminal Body weight | Adrenals | Adrenals Body (%) | Adrenals Brain (%) | Brain | Brain Body (%) | Epididymides | Epididymides Body (%) | Epididymides Brain (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative to | | | | | | | | | | |
| 3M | 3001 | 468.4 | 0.0520 | 0.0111 | 2.33 | 2.2360 | 0.477 | 1.1590 | 0.247 | 51.8 |
| | 3002 | 420.1 | 0.0520 | 0.0124 | 2.35 | 2.2130 | 0.527 | 1.4020 | 0.334 | 63.4 |
| | 3003 | 452.6 | 0.0540 | 0.0119 | 2.56 | 2.1070 | 0.466 | 1.3760 | 0.304 | 65.3 |
| | 3004 | 516.7 | 0.0630 | 0.0122 | 2.78 | 2.2700 | 0.439 | 1.3380 | 0.259 | 58.9 |
| | 3005 | 507.5 | 0.0540 | 0.0106 | 2.39 | 2.2550 | 0.444 | 1.7360 | 0.342 | 77.0 |
| | 3006 | 603.6 | 0.0790 | 0.0131 | 3.33 | 2.3720 | 0.393 | 1.7530 | 0.290 | 73.9 |
| | 3007 | 594.9 | 0.0430 | 0.0072 | 1.90 | 2.2590 | 0.380 | 2.1350 | 0.359 | 94.5 |
| | 3008 | 499.8 | 0.0530 | 0.0106 | 2.43 | 2.1770 | 0.436 | 1.5660 | 0.313 | 71.9 |
| | 3009 | 503.0 | 0.0660 | 0.0131 | 2.87 | 2.3010 | 0.457 | 1.7840 | 0.355 | 77.5 |
| | 3010 | 492.8 | 0.0490 | 0.0099 | 2.19 | 2.2390 | 0.454 | 1.4090 | 0.286 | 62.9 |
| 4M | 4001 | 453.0 | 0.0600 | 0.0132 | 2.76 | 2.1730 | 0.480 | 1.6370 | 0.361 | 75.3 |
| | 4002 | 503.3 | 0.0460 | 0.0091 | 2.05 | 2.2480 | 0.447 | 1.4550 | 0.289 | 64.7 |
| | 4003 | 555.2 | 0.0550 | 0.0099 | 2.37 | 2.3250 | 0.419 | 1.7520 | 0.316 | 75.4 |
| | 4004 | 448.1 | 0.0570 | 0.0127 | 2.58 | 2.2080 | 0.493 | 1.4950 | 0.334 | 67.7 |
| | 4005 | 485.7 | 0.0560 | 0.0115 | 2.64 | 2.1180 | 0.436 | 1.6960 | 0.349 | 80.1 |
| | 4006 | 553.6 | 0.0580 | 0.0105 | 2.59 | 2.2370 | 0.404 | 1.5610 | 0.282 | 69.8 |
| | 4007 | 539.4 | 0.0670 | 0.0124 | 2.81 | 2.3840 | 0.442 | 1.9230 | 0.357 | 80.7 |
| | 4008 | 396.0 | 0.0680 | 0.0172 | 3.26 | 2.0870 | 0.527 | 1.4170 | 0.358 | 67.9 |
| | 4009 | 513.2 | 0.0520 | 0.0101 | 2.50 | 2.0800 | 0.405 | 1.6850 | 0.328 | 81.0 |
| | 4010 | 440.2 | 0.0660 | 0.0150 | 3.19 | 2.0690 | 0.470 | 1.6390 | 0.372 | 79.2 |

APPENDIX 13 (cont) Organ weights - individual values (g) - terminal sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Heart | Heart | Heart | Kidneys | Kidneys | Kidneys | Liver | Liver | Liver |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative to | | | Body (%) | Brain (%) | | Body (%) | Brain (%) | | Body (%) | Brain (%) |
| 3M | 3001 | 1.8320 | 0.391 | 81.9 | 3.1310 | 0.668 | 140 | 11.0050 | 2.35 | 492 |
| | 3002 | 1.5390 | 0.366 | 69.5 | 2.5930 | 0.617 | 117 | 9.4470 | 2.25 | 427 |
| | 3003 | 1.3190 | 0.291 | 62.6 | 2.6930 | 0.595 | 128 | 10.2570 | 2.27 | 487 |
| | 3004 | 1.6760 | 0.324 | 73.8 | 3.4860 | 0.675 | 154 | 13.0710 | 2.53 | 576 |
| | 3005 | 1.7160 | 0.338 | 76.1 | 3.2890 | 0.648 | 146 | 10.1630 | 2.00 | 451 |
| | 3006 | 2.2970 | 0.381 | 96.8 | 3.5610 | 0.590 | 150 | 15.9400 | 2.64 | 672 |
| | 3007 | 1.7840 | 0.300 | 79.0 | 4.0180 | 0.675 | 178 | 14.8050 | 2.49 | 655 |
| | 3008 | 1.5910 | 0.318 | 73.1 | 2.8850 | 0.577 | 133 | 10.5340 | 2.11 | 484 |
| | 3009 | 1.5810 | 0.314 | 68.7 | 3.6900 | 0.734 | 160 | 11.4060 | 2.27 | 496 |
| | 3010 | 1.5580 | 0.316 | 69.6 | 2.9920 | 0.607 | 134 | 11.0710 | 2.25 | 494 |
| 4M | 4001 | 1.8710 | 0.413 | 86.1 | 3.3460 | 0.739 | 154 | 10.8140 | 2.39 | 498 |
| | 4002 | 1.5600 | 0.310 | 69.4 | 2.9070 | 0.578 | 129 | 12.3530 | 2.45 | 550 |
| | 4003 | 1.9000 | 0.342 | 81.7 | 3.2370 | 0.583 | 139 | 14.6610 | 2.64 | 631 |
| | 4004 | 1.3990 | 0.312 | 63.4 | 3.6190 | 0.808 | 164 | 10.6320 | 2.37 | 482 |
| | 4005 | 1.8020 | 0.371 | 85.1 | 2.9570 | 0.609 | 140 | 11.6750 | 2.40 | 551 |
| | 4006 | 1.9100 | 0.345 | 85.4 | 3.4150 | 0.617 | 153 | 13.4160 | 2.42 | 600 |
| | 4007 | 2.0100 | 0.373 | 84.3 | 3.4440 | 0.638 | 144 | 13.6380 | 2.53 | 572 |
| | 4008 | 1.4330 | 0.362 | 68.7 | 3.1450 | 0.794 | 151 | 8.7990 | 2.22 | 422 |
| | 4009 | 1.5020 | 0.293 | 72.2 | 3.1860 | 0.621 | 153 | 11.9660 | 2.33 | 575 |
| | 4010 | 1.3320 | 0.303 | 64.4 | 2.9210 | 0.664 | 141 | 9.3320 | 2.12 | 451 |

APPENDIX 13 (cont) Organ weights - individual values (g) - terminal sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Lungs and Bronchi | Lungs and Bronchi | Lungs and Bronchi | Pituitary | Pituitary | Pituitary | Spleen | Spleen | Spleen |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative to | | | Body (%) | Brain (%) | | Body (%) | Brain (%) | | Body (%) | Brain (%) |
| 3M | 3001 | 1.5457 | 0.330 | 69.1 | 0.0174 | 0.0037 | 0.778 | 1.0540 | 0.225 | 47.1 |
| | 3002 | 1.6183 | 0.385 | 73.1 | 0.0128 | 0.0030 | 0.578 | 0.6470 | 0.154 | 29.2 |
| | 3003 | 1.4614 | 0.323 | 69.4 | 0.0136 | 0.0030 | 0.645 | 0.9150 | 0.202 | 43.4 |
| | 3004 | 1.7000 | 0.329 | 74.9 | 0.0146 | 0.0028 | 0.643 | 1.2560 | 0.243 | 55.3 |
| | 3005 | 1.7143 | 0.338 | 76.0 | 0.0159 | 0.0031 | 0.705 | 1.1850 | 0.233 | 52.5 |
| | 3006 | 1.8062 | 0.299 | 76.1 | 0.0145 | 0.0024 | 0.611 | 1.0340 | 0.171 | 43.6 |
| | 3007 | 1.9852 | 0.334 | 87.9 | 0.0153 | 0.0026 | 0.677 | 1.0870 | 0.183 | 48.1 |
| | 3008 | 1.8346 | 0.367 | 84.3 | 0.0147 | 0.0029 | 0.675 | 0.9090 | 0.182 | 41.8 |
| | 3009 | 1.5364 | 0.305 | 66.8 | 0.0145 | 0.0029 | 0.630 | 1.3530 | 0.269 | 58.8 |
| | 3010 | 1.9270 | 0.391 | 86.1 | 0.0165 | 0.0033 | 0.737 | 1.0250 | 0.208 | 45.8 |
| 4M | 4001 | 1.3450 | 0.297 | 61.9 | 0.0151 | 0.0033 | 0.695 | 1.2480 | 0.275 | 57.4 |
| | 4002 | 1.7948 | 0.357 | 79.8 | 0.0128 | 0.0025 | 0.569 | 0.9590 | 0.191 | 42.7 |
| | 4003 | 1.8030 | 0.325 | 77.5 | 0.0147 | 0.0026 | 0.632 | 0.9900 | 0.178 | 42.6 |
| | 4004 | 1.7157 | 0.383 | 77.7 | 0.0172 | 0.0038 | 0.779 | 0.7580 | 0.169 | 34.3 |
| | 4005 | 1.5484 | 0.319 | 73.1 | 0.0146 | 0.0030 | 0.689 | 0.7390 | 0.152 | 34.9 |
| | 4006 | 1.5796 | 0.285 | 70.6 | 0.0150 | 0.0027 | 0.671 | 1.2080 | 0.218 | 54.0 |
| | 4007 | 1.9333 | 0.358 | 81.1 | 0.0178 | 0.0033 | 0.747 | 0.8650 | 0.160 | 36.3 |
| | 4008 | 1.4832 | 0.375 | 71.1 | 0.0158 | 0.0040 | 0.757 | 0.8030 | 0.203 | 38.5 |
| | 4009 | 1.7107 | 0.333 | 82.2 | 0.0161 | 0.0031 | 0.774 | 0.8990 | 0.175 | 43.2 |
| | 4010 | 1.5491 | 0.352 | 74.9 | 0.0129 | 0.0029 | 0.623 | 0.8640 | 0.196 | 41.8 |

APPENDIX 13 (cont) Organ weights - individual values (g) - terminal sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Testes | Testes Body (%) | Testes Brain (%) | Thymus | Thymus Body (%) | Thymus Brain (%) | Thyroids and Parathyroids | Thyroids and Parathyroids Body (%) | Thyroids and Parathyroids Brain (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative to | | | | | | | | | | |
| 3M | 3001 | 2.4250 | 0.518 | 108 | 0.4700 | 0.1003 | 21.0 | 0.0213 | 0.0045 | 0.95 |
| | 3002 | 3.6200 | 0.862 | 164 | 0.3200 | 0.0762 | 14.5 | 0.0282 | 0.0067 | 1.27 |
| | 3003 | 3.5790 | 0.791 | 170 | 0.3210 | 0.0709 | 15.2 | 0.0224 | 0.0049 | 1.06 |
| | 3004 | 3.1280 | 0.605 | 138 | 0.3800 | 0.0735 | 16.7 | 0.0264 | 0.0051 | 1.16 |
| | 3005 | 3.8050 | 0.750 | 169 | 0.4330 | 0.0853 | 19.2 | 0.0235 | 0.0046 | 1.04 |
| | 3006 | 3.7340 | 0.619 | 157 | 0.2740 | 0.0454 | 11.6 | 0.0245 | 0.0041 | 1.03 |
| | 3007 | 4.0760 | 0.685 | 180 | 0.5690 | 0.0956 | 25.2 | 0.0307 | 0.0052 | 1.36 |
| | 3008 | 3.7900 | 0.758 | 174 | 0.4760 | 0.0952 | 21.9 | 0.0281 | 0.0056 | 1.29 |
| | 3009 | 3.5860 | 0.713 | 156 | 0.4570 | 0.0909 | 19.9 | 0.0221 | 0.0044 | 0.96 |
| | 3010 | 3.8400 | 0.779 | 172 | 0.5680 | 0.1153 | 25.4 | 0.0241 | 0.0049 | 1.08 |
| 4M | 4001 | 3.4030 | 0.751 | 157 | 0.3750 | 0.0828 | 17.3 | 0.0204 | 0.0045 | 0.94 |
| | 4002 | 3.6280 | 0.721 | 161 | 0.3520 | 0.0699 | 15.7 | 0.0225 | 0.0045 | 1.00 |
| | 4003 | 3.8990 | 0.702 | 168 | 0.4590 | 0.0827 | 19.7 | 0.0239 | 0.0043 | 1.03 |
| | 4004 | 3.5530 | 0.793 | 161 | 0.3810 | 0.0850 | 17.3 | 0.0221 | 0.0049 | 1.00 |
| | 4005 | 3.5800 | 0.737 | 169 | 0.2700 | 0.0556 | 12.7 | 0.0220 | 0.0045 | 1.04 |
| | 4006 | 3.1620 | 0.571 | 141 | 0.4620 | 0.0835 | 20.7 | 0.0251 | 0.0045 | 1.12 |
| | 4007 | 3.9170 | 0.726 | 164 | 0.5730 | 0.1062 | 24.0 | 0.0242 | 0.0045 | 1.02 |
| | 4008 | 3.5060 | 0.885 | 168 | 0.4280 | 0.1081 | 20.5 | 0.0278 | 0.0070 | 1.33 |
| | 4009 | 3.8120 | 0.743 | 183 | 0.5680 | 0.1107 | 27.3 | 0.0274 | 0.0053 | 1.32 |
| | 4010 | 3.4710 | 0.789 | 168 | 0.5480 | 0.1245 | 26.5 | 0.0206 | 0.0047 | 1.00 |

APPENDIX 13 (cont) Organ weights - individual values (g) - terminal sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Prostate and Seminal Vesicles | Prostate and Seminal Vesicles | Prostate and Seminal Vesicles |
|---|---|---|---|---|
| Relative to | | | Body (%) | Brain (%) |
| 3M | 3001 | 4.1760 | 0.892 | 187 |
| | 3002 | 3.6880 | 0.878 | 167 |
| | 3003 | 3.0110 | 0.665 | 143 |
| | 3004 | 4.0910 | 0.792 | 180 |
| | 3005 | 4.2010 | 0.828 | 186 |
| | 3006 | 4.5290 | 0.750 | 191 |
| | 3007 | 4.8010 | 0.807 | 213 |
| | 3008 | 3.7400 | 0.748 | 172 |
| | 3009 | 3.7560 | 0.747 | 163 |
| | 3010 | 4.0010 | 0.812 | 179 |
| 4M | 4001 | 3.9430 | 0.870 | 181 |
| | 4002 | 2.9850 | 0.593 | 133 |
| | 4003 | 4.7190 | 0.850 | 203 |
| | 4004 | 3.9940 | 0.891 | 181 |
| | 4005 | 3.7500 | 0.772 | 177 |
| | 4006 | 3.4630 | 0.626 | 155 |
| | 4007 | 4.8360 | 0.897 | 203 |
| | 4008 | 3.5050 | 0.885 | 168 |
| | 4009 | 3.0810 | 0.600 | 148 |
| | 4010 | 3.1870 | 0.724 | 154 |

APPENDIX 13 (cont) Organ weights - individual values (g) - terminal sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Terminal Body weight | Adrenals | Adrenals Body (%) | Adrenals Brain (%) | Brain | Brain Body (%) | Heart | Heart Body (%) | Heart Brain (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative to | | | | | | | | | | |
| 1F | 1501 | 310.6 | 0.0750 | 0.0241 | 3.67 | 2.0430 | 0.658 | 1.0760 | 0.346 | 52.7 |
| | 1502 | 297.0 | 0.0630 | 0.0212 | 3.19 | 1.9770 | 0.666 | 0.9990 | 0.336 | 50.5 |
| | 1503 | 286.1 | 0.0500 | 0.0175 | 2.47 | 2.0280 | 0.709 | 1.0520 | 0.368 | 51.9 |
| | 1504 | 250.2 | 0.0410 | 0.0164 | 2.16 | 1.8950 | 0.757 | 0.9810 | 0.392 | 51.8 |
| | 1505 | 286.9 | 0.0510 | 0.0178 | 2.77 | 1.8390 | 0.641 | 1.1910 | 0.415 | 64.8 |
| | 1506 | 278.8 | 0.0610 | 0.0219 | 3.00 | 2.0310 | 0.728 | 1.0770 | 0.386 | 53.0 |
| | 1507 | 266.0 | 0.0560 | 0.0211 | 2.79 | 2.0090 | 0.755 | 1.0180 | 0.383 | 50.7 |
| | 1508 | 284.0 | 0.0470 | 0.0165 | 2.38 | 1.9720 | 0.694 | 1.0410 | 0.367 | 52.8 |
| | 1509 | 289.5 | 0.0590 | 0.0204 | 3.03 | 1.9480 | 0.673 | 1.0940 | 0.378 | 56.2 |
| | 1510 | 278.0 | 0.0590 | 0.0212 | 2.88 | 2.0460 | 0.736 | 1.0260 | 0.369 | 50.1 |
| 2F | 2501 | 276.8 | 0.0500 | 0.0181 | 2.68 | 1.8650 | 0.674 | 0.8630 | 0.312 | 46.3 |
| | 2502 | 282.2 | 0.0590 | 0.0209 | 2.88 | 2.0490 | 0.726 | 1.2080 | 0.428 | 59.0 |
| | 2503 | 277.8 | 0.0730 | 0.0263 | 3.80 | 1.9190 | 0.691 | 1.0650 | 0.383 | 55.5 |
| | 2504 | 276.0 | 0.0550 | 0.0199 | 2.83 | 1.9460 | 0.705 | 1.0060 | 0.364 | 51.7 |
| | 2505 | 273.9 | 0.0500 | 0.0183 | 2.59 | 1.9300 | 0.705 | 1.0350 | 0.378 | 53.6 |
| | 2506 | 300.2 | 0.0640 | 0.0213 | 3.21 | 1.9910 | 0.663 | 1.2250 | 0.408 | 61.5 |
| | 2507 | 282.6 | 0.0580 | 0.0205 | 2.78 | 2.0900 | 0.740 | 0.9670 | 0.342 | 46.3 |
| | 2508 | 281.7 | 0.0570 | 0.0202 | 2.81 | 2.0260 | 0.719 | 1.1820 | 0.420 | 58.3 |
| | 2509 | 294.0 | 0.0710 | 0.0241 | 4.17 | 1.7040 | 0.580 | 0.8990 | 0.306 | 52.8 |
| | 2510 | 271.1 | 0.0460 | 0.0170 | 2.44 | 1.8880 | 0.696 | 0.8790 | 0.324 | 46.6 |

APPENDIX 13 (cont) Organ weights - individual values (g) - terminal sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Kidneys | Kidneys | Kidneys | Liver | Liver | Liver | Lungs and Bronchi | Lungs and Bronchi | Lungs and Bronchi |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative to | | | Body (%) | Brain (%) | | Body (%) | Brain (%) | | Body (%) | Brain (%) |
| 1F | 1501 | 1.8450 | 0.594 | 90.3 | 7.9800 | 2.57 | 391 | 1.3528 | 0.436 | 66.2 |
| | 1502 | 1.7900 | 0.603 | 90.5 | 7.9400 | 2.67 | 402 | 1.3650 | 0.460 | 69.0 |
| | 1503 | 1.6220 | 0.567 | 80.0 | 7.5440 | 2.64 | 372 | 1.3292 | 0.465 | 65.5 |
| | 1504 | 1.5200 | 0.608 | 80.2 | 6.3110 | 2.52 | 333 | 1.0895 | 0.435 | 57.5 |
| | 1505 | 1.6220 | 0.565 | 88.2 | 6.8260 | 2.38 | 371 | 1.1575 | 0.403 | 62.9 |
| | 1506 | 2.1820 | 0.783 | 107.4 | 6.6470 | 2.38 | 327 | 1.2998 | 0.466 | 64.0 |
| | 1507 | 1.7030 | 0.640 | 84.8 | 6.7320 | 2.53 | 335 | 1.3594 | 0.511 | 67.7 |
| | 1508 | 1.4570 | 0.513 | 73.9 | 7.4460 | 2.62 | 378 | 1.1707 | 0.412 | 59.4 |
| | 1509 | 1.5740 | 0.544 | 80.8 | 6.5940 | 2.28 | 339 | 1.3995 | 0.483 | 71.8 |
| | 1510 | 1.6300 | 0.586 | 79.7 | 7.0700 | 2.54 | 346 | 1.2636 | 0.455 | 61.8 |
| 2F | 2501 | 1.5430 | 0.557 | 82.7 | 6.4450 | 2.33 | 346 | 1.1809 | 0.427 | 63.3 |
| | 2502 | 1.8970 | 0.672 | 92.6 | 6.8390 | 2.42 | 334 | 1.4054 | 0.498 | 68.6 |
| | 2503 | 1.5060 | 0.542 | 78.5 | 6.9690 | 2.51 | 363 | 1.3172 | 0.474 | 68.6 |
| | 2504 | 1.7580 | 0.637 | 90.3 | 6.4530 | 2.34 | 332 | 1.3211 | 0.479 | 67.9 |
| | 2505 | 1.5150 | 0.553 | 78.5 | 6.6970 | 2.45 | 347 | 1.3440 | 0.491 | 69.6 |
| | 2506 | 1.8100 | 0.603 | 90.9 | 8.1070 | 2.70 | 407 | 1.3505 | 0.450 | 67.8 |
| | 2507 | 1.9000 | 0.672 | 90.9 | 7.6650 | 2.71 | 367 | 1.2317 | 0.436 | 58.9 |
| | 2508 | 1.6440 | 0.584 | 81.1 | 7.0050 | 2.49 | 346 | 1.2510 | 0.444 | 61.7 |
| | 2509 | 1.6330 | 0.555 | 95.8 | 6.5180 | 2.22 | 383 | 1.3349 | 0.454 | 78.3 |
| | 2510 | 1.3790 | 0.509 | 73.0 | 6.0270 | 2.22 | 319 | 1.3816 | 0.510 | 73.2 |

APPENDIX 13 (cont) Organ weights - individual values (g) - terminal sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Ovaries | Ovaries | Ovaries | Pituitary | Pituitary | Pituitary | Spleen | Spleen | Spleen |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative to | | | Body (%) | Brain (%) | | Body (%) | Brain (%) | | Body (%) | Brain (%) |
| 1F | 1501 | 0.0960 | 0.0309 | 4.70 | 0.0194 | 0.0062 | 0.950 | 0.9330 | 0.300 | 45.7 |
| | 1502 | 0.0720 | 0.0242 | 3.64 | 0.0239 | 0.0080 | 1.209 | 0.6410 | 0.216 | 32.4 |
| | 1503 | 0.0860 | 0.0301 | 4.24 | 0.0224 | 0.0078 | 1.105 | 0.5540 | 0.194 | 27.3 |
| | 1504 | 0.0740 | 0.0296 | 3.91 | 0.0165 | 0.0066 | 0.871 | 0.4730 | 0.189 | 25.0 |
| | 1505 | 0.1310 | 0.0457 | 7.12 | 0.0202 | 0.0070 | 1.098 | 0.6030 | 0.210 | 32.8 |
| | 1506 | 0.1260 | 0.0452 | 6.20 | 0.0247 | 0.0089 | 1.216 | 0.7680 | 0.275 | 37.8 |
| | 1507 | 0.0920 | 0.0346 | 4.58 | 0.0232 | 0.0087 | 1.155 | 0.6410 | 0.241 | 31.9 |
| | 1508 | 0.0890 | 0.0313 | 4.51 | 0.0217 | 0.0076 | 1.100 | 0.4800 | 0.169 | 24.3 |
| | 1509 | 0.1500 | 0.0518 | 7.70 | 0.0194 | 0.0067 | 0.996 | 0.6000 | 0.207 | 30.8 |
| | 1510 | 0.0950 | 0.0342 | 4.64 | 0.0161 | 0.0058 | 0.787 | 0.5190 | 0.187 | 25.4 |
| 2F | 2501 | 0.0760 | 0.0275 | 4.08 | 0.0154 | 0.0056 | 0.826 | 0.5750 | 0.208 | 30.8 |
| | 2502 | 0.0890 | 0.0315 | 4.34 | 0.0207 | 0.0073 | 1.010 | 0.7250 | 0.257 | 35.4 |
| | 2503 | 0.0910 | 0.0328 | 4.74 | 0.0243 | 0.0087 | 1.266 | 0.5960 | 0.215 | 31.1 |
| | 2504 | 0.0960 | 0.0348 | 4.93 | 0.0194 | 0.0070 | 0.997 | 0.4640 | 0.168 | 23.8 |
| | 2505 | 0.1030 | 0.0376 | 5.34 | 0.0182 | 0.0066 | 0.943 | 0.6780 | 0.248 | 35.1 |
| | 2506 | 0.0810 | 0.0270 | 4.07 | 0.0231 | 0.0077 | 1.160 | 0.7990 | 0.266 | 40.1 |
| | 2507 | 0.0810 | 0.0287 | 3.88 | 0.0209 | 0.0074 | 1.000 | 0.6040 | 0.214 | 28.9 |
| | 2508 | 0.0740 | 0.0263 | 3.65 | 0.0208 | 0.0074 | 1.027 | 0.5180 | 0.184 | 25.6 |
| | 2509 | 0.1030 | 0.0350 | 6.04 | 0.0142 | 0.0048 | 0.833 | 0.6120 | 0.208 | 35.9 |
| | 2510 | 0.0810 | 0.0299 | 4.29 | 0.0185 | 0.0068 | 0.980 | 0.5980 | 0.221 | 31.7 |

APPENDIX 13 (cont) Organ weights - individual values (g) - terminal sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Thymus | Thymus Body (%) | Thymus Brain (%) | Thyroids and Parathyroids | Thyroids and Parathyroids Body (%) | Thyroids and Parathyroids Brain (%) | Uterus and Cervix | Uterus and Cervix Body (%) | Uterus and Cervix Brain (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative to | | | | | | | | | | |
| 1F | 1501 | 0.5030 | 0.162 | 24.6 | 0.0239 | 0.0077 | 1.17 | 0.7950 | 0.256 | 38.9 |
| | 1502 | 0.3260 | 0.110 | 16.5 | 0.0200 | 0.0067 | 1.01 | 1.1350 | 0.382 | 57.4 |
| | 1503 | 0.3530 | 0.123 | 17.4 | 0.0214 | 0.0075 | 1.06 | 0.7840 | 0.274 | 38.7 |
| | 1504 | 0.1910 | 0.076 | 10.1 | 0.0221 | 0.0088 | 1.17 | 1.2580 | 0.503 | 66.4 |
| | 1505 | 0.4590 | 0.160 | 25.0 | 0.0266 | 0.0093 | 1.45 | 0.7570 | 0.264 | 41.2 |
| | 1506 | 0.4250 | 0.152 | 20.9 | 0.0201 | 0.0072 | 0.99 | 1.4220 | 0.510 | 70.0 |
| | 1507 | 0.3290 | 0.124 | 16.4 | 0.0213 | 0.0080 | 1.06 | 0.7460 | 0.280 | 37.1 |
| | 1508 | 0.3420 | 0.120 | 17.3 | 0.0231 | 0.0081 | 1.17 | 0.6480 | 0.228 | 32.9 |
| | 1509 | 0.4300 | 0.149 | 22.1 | 0.0199 | 0.0069 | 1.02 | 0.6430 | 0.222 | 33.0 |
| | 1510 | 0.3830 | 0.138 | 18.7 | 0.0176 | 0.0063 | 0.86 | 0.8160 | 0.294 | 39.9 |
| 2F | 2501 | 0.3470 | 0.125 | 18.6 | 0.0245 | 0.0089 | 1.31 | 0.6870 | 0.248 | 36.8 |
| | 2502 | 0.3130 | 0.111 | 15.3 | 0.0237 | 0.0084 | 1.16 | 0.4760 | 0.169 | 23.2 |
| | 2503 | 0.3330 | 0.120 | 17.4 | 0.0285 | 0.0103 | 1.49 | 0.7720 | 0.278 | 40.2 |
| | 2504 | 0.6120 | 0.222 | 31.4 | 0.0249 | 0.0090 | 1.28 | 0.6940 | 0.251 | 35.7 |
| | 2505 | 0.3530 | 0.129 | 18.3 | 0.0253 | 0.0092 | 1.31 | 0.6750 | 0.246 | 35.0 |
| | 2506 | 0.2560 | 0.085 | 12.9 | 0.0274 | 0.0091 | 1.38 | 1.2960 | 0.432 | 65.1 |
| | 2507 | 0.4040 | 0.143 | 19.3 | 0.0189 | 0.0067 | 0.90 | 0.7320 | 0.259 | 35.0 |
| | 2508 | 0.2530 | 0.090 | 12.5 | 0.0266 | 0.0094 | 1.31 | 1.7790 | 0.632 | 87.8 |
| | 2509 | 0.4040 | 0.137 | 23.7 | 0.0269 | 0.0091 | 1.58 | 0.5060 | 0.172 | 29.7 |
| | 2510 | 0.2420 | 0.089 | 12.8 | 0.0190 | 0.0070 | 1.01 | 0.6370 | 0.235 | 33.7 |

APPENDIX 13 (cont) Organ weights - individual values (g) - terminal sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Terminal Body weight | Adrenals | Adrenals Body (%) | Adrenals Brain (%) | Brain | Brain Body (%) | Heart | Heart Body (%) | Heart Brain (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative to | | | | | | | | | | |
| 3F | 3501 | 293.2 | 0.0540 | 0.0184 | 2.53 | 2.1330 | 0.727 | 1.0550 | 0.360 | 49.5 |
| | 3502 | 300.2 | 0.0670 | 0.0223 | 3.61 | 1.8555 | 0.618 | 1.0140 | 0.338 | 54.6 |
| | 3503 | 259.3 | 0.0580 | 0.0224 | 2.84 | 2.0420 | 0.788 | 1.0100 | 0.390 | 49.5 |
| | 3504 | 293.2 | 0.0510 | 0.0174 | 2.53 | 2.0160 | 0.688 | 1.0790 | 0.368 | 53.5 |
| | 3505 | 314.5 | 0.0480 | 0.0153 | 2.55 | 1.8840 | 0.599 | 1.0110 | 0.321 | 53.7 |
| | 3506 | 282.5 | 0.0580 | 0.0205 | 2.82 | 2.0540 | 0.727 | 1.1570 | 0.410 | 56.3 |
| | 3507 | 288.1 | 0.0560 | 0.0194 | 2.46 | 2.2730 | 0.789 | 1.0040 | 0.348 | 44.2 |
| | 3508 | 314.4 | 0.0690 | 0.0219 | 3.30 | 2.0930 | 0.666 | 0.9250 | 0.294 | 44.2 |
| | 3509 | 295.2 | 0.0510 | 0.0173 | 2.57 | 1.9880 | 0.673 | 0.9530 | 0.323 | 47.9 |
| | 3510 | 292.7 | 0.0700 | 0.0239 | 3.67 | 1.9080 | 0.652 | 1.0620 | 0.363 | 55.7 |
| 4F | 4501 | 252.6 | 0.0510 | 0.0202 | 2.73 | 1.8700 | 0.740 | 1.0700 | 0.424 | 57.2 |
| | 4502 | 285.1 | 0.0490 | 0.0172 | 2.24 | 2.1850 | 0.766 | 1.0720 | 0.376 | 49.1 |
| | 4503 | 288.2 | 0.0610 | 0.0212 | 3.06 | 1.9960 | 0.693 | 1.1590 | 0.402 | 58.1 |
| | 4504 | 249.5 | 0.0500 | 0.0200 | 2.41 | 2.0740 | 0.831 | 0.8660 | 0.347 | 41.8 |
| | 4505 | 248.9 | 0.0540 | 0.0217 | 2.72 | 1.9820 | 0.796 | 1.2640 | 0.508 | 63.8 |
| | 4506 | 300.0 | 0.0640 | 0.0213 | 3.17 | 2.0180 | 0.673 | 1.2580 | 0.419 | 62.3 |
| | 4507 | 261.3 | 0.0470 | 0.0180 | 2.23 | 2.1090 | 0.807 | 1.0050 | 0.385 | 47.7 |
| | 4508 | 291.6 | 0.0580 | 0.0199 | 2.73 | 2.1220 | 0.728 | 1.0010 | 0.343 | 47.2 |
| | 4509 | 284.7 | 0.0520 | 0.0183 | 2.75 | 1.8940 | 0.665 | 1.0770 | 0.378 | 56.9 |
| | 4510 | 311.2 | 0.0580 | 0.0186 | 2.89 | 2.0090 | 0.646 | 1.1160 | 0.359 | 55.6 |

APPENDIX 13 (cont) Organ weights - individual values (g) - terminal sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Kidneys | Kidneys Body (%) | Kidneys Brain (%) | Liver | Liver Body (%) | Liver Brain (%) | Lungs and Bronchi | Lungs and Bronchi Body (%) | Lungs and Bronchi Brain (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative to | | | | | | | | | | |
| 3F | 3501 | 2.0670 | 0.705 | 96.9 | 8.2650 | 2.82 | 387 | 1.3116 | 0.447 | 61.5 |
| | 3502 | 1.7130 | 0.571 | 92.3 | 7.7730 | 2.59 | 419 | 1.3299 | 0.443 | 71.7 |
| | 3503 | 1.5770 | 0.608 | 77.2 | 6.7200 | 2.59 | 329 | 1.3235 | 0.510 | 64.8 |
| | 3504 | 1.8170 | 0.620 | 90.1 | 7.5140 | 2.56 | 373 | 1.3020 | 0.444 | 64.6 |
| | 3505 | 1.7110 | 0.544 | 90.8 | 7.6350 | 2.43 | 405 | 1.1401 | 0.363 | 60.5 |
| | 3506 | 1.7430 | 0.617 | 84.9 | 7.4240 | 2.63 | 361 | 1.3913 | 0.492 | 67.7 |
| | 3507 | 1.9220 | 0.667 | 84.6 | 8.1330 | 2.82 | 358 | 1.3856 | 0.481 | 61.0 |
| | 3508 | 1.8480 | 0.588 | 88.3 | 6.8630 | 2.18 | 328 | 1.3920 | 0.443 | 66.5 |
| | 3509 | 1.5930 | 0.540 | 80.1 | 6.8400 | 2.32 | 344 | 1.4630 | 0.496 | 73.6 |
| | 3510 | 1.7520 | 0.599 | 91.8 | 7.9070 | 2.70 | 414 | 1.4448 | 0.494 | 75.7 |
| 4F | 4501 | 1.6980 | 0.672 | 90.8 | 6.2850 | 2.49 | 336 | 1.0983 | 0.435 | 58.7 |
| | 4502 | 1.6880 | 0.592 | 77.3 | 6.1890 | 2.17 | 283 | 1.2148 | 0.426 | 55.6 |
| | 4503 | 1.7440 | 0.605 | 87.4 | 7.1990 | 2.50 | 361 | 1.3816 | 0.479 | 69.2 |
| | 4504 | 1.6010 | 0.642 | 77.2 | 6.1280 | 2.46 | 295 | 1.2434 | 0.498 | 60.0 |
| | 4505 | 1.5740 | 0.632 | 79.4 | 6.0100 | 2.41 | 303 | 1.1880 | 0.477 | 59.9 |
| | 4506 | 1.8090 | 0.603 | 89.6 | 7.4540 | 2.48 | 369 | 1.4637 | 0.488 | 72.5 |
| | 4507 | 1.8790 | 0.719 | 89.1 | 6.6500 | 2.54 | 315 | 1.3682 | 0.524 | 64.9 |
| | 4508 | 1.9730 | 0.677 | 93.0 | 7.2240 | 2.48 | 340 | 1.2730 | 0.437 | 60.0 |
| | 4509 | 1.8320 | 0.643 | 96.7 | 7.5180 | 2.64 | 397 | 1.2906 | 0.453 | 68.1 |
| | 4510 | 2.0950 | 0.673 | 104.3 | 7.8380 | 2.52 | 390 | 1.3252 | 0.426 | 66.0 |

APPENDIX 13 (cont) Organ weights - individual values (g) - terminal sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Ovaries | Ovaries | Ovaries | Pituitary | Pituitary | Pituitary | Spleen | Spleen | Spleen |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative to | | | Body (%) | Brain (%) | | Body (%) | Brain (%) | | Body (%) | Brain (%) |
| 3F | 3501 | 0.0800 | 0.0273 | 3.75 | 0.0157 | 0.0054 | 0.736 | 0.7530 | 0.257 | 35.3 |
| | 3502 | 0.0880 | 0.0293 | 4.74 | 0.0097 | 0.0032 | 0.523 | 0.5280 | 0.176 | 28.5 |
| | 3503 | 0.0790 | 0.0305 | 3.87 | 0.0163 | 0.0063 | 0.798 | 0.4480 | 0.173 | 21.9 |
| | 3504 | 0.1020 | 0.0348 | 5.06 | 0.0173 | 0.0059 | 0.858 | 0.6720 | 0.229 | 33.3 |
| | 3505 | 0.0730 | 0.0232 | 3.87 | 0.0207 | 0.0066 | 1.099 | 0.6030 | 0.192 | 32.0 |
| | 3506 | 0.1140 | 0.0404 | 5.55 | 0.0252 | 0.0089 | 1.227 | 0.6190 | 0.219 | 30.1 |
| | 3507 | 0.0950 | 0.0330 | 4.18 | 0.0227 | 0.0079 | 0.999 | 0.5930 | 0.206 | 26.1 |
| | 3508 | 0.0780 | 0.0248 | 3.73 | 0.0203 | 0.0065 | 0.970 | 0.6340 | 0.202 | 30.3 |
| | 3509 | 0.0740 | 0.0251 | 3.72 | 0.0180 | 0.0061 | 0.905 | 0.6140 | 0.208 | 30.9 |
| | 3510 | 0.1180 | 0.0403 | 6.18 | 0.0218 | 0.0074 | 1.143 | 0.6420 | 0.219 | 33.6 |
| 4F | 4501 | 0.0840 | 0.0333 | 4.49 | 0.0228 | 0.0090 | 1.219 | 0.7000 | 0.277 | 37.4 |
| | 4502 | 0.0880 | 0.0309 | 4.03 | 0.0163 | 0.0057 | 0.746 | 0.5030 | 0.176 | 23.0 |
| | 4503 | 0.0870 | 0.0302 | 4.36 | 0.0217 | 0.0075 | 1.087 | 0.6550 | 0.227 | 32.8 |
| | 4504 | 0.0640 | 0.0257 | 3.09 | 0.0212 | 0.0085 | 1.022 | 0.4890 | 0.196 | 23.6 |
| | 4505 | 0.0990 | 0.0398 | 4.99 | 0.0179 | 0.0072 | 0.903 | 0.6890 | 0.277 | 34.8 |
| | 4506 | 0.1070 | 0.0357 | 5.30 | 0.0222 | 0.0074 | 1.100 | 0.5880 | 0.196 | 29.1 |
| | 4507 | 0.0780 | 0.0299 | 3.70 | 0.0193 | 0.0074 | 0.915 | 0.7270 | 0.278 | 34.5 |
| | 4508 | 0.1040 | 0.0357 | 4.90 | 0.0171 | 0.0059 | 0.806 | 0.7000 | 0.240 | 33.0 |
| | 4509 | 0.1040 | 0.0365 | 5.49 | 0.0208 | 0.0073 | 1.098 | 0.7010 | 0.246 | 37.0 |
| | 4510 | 0.0910 | 0.0292 | 4.53 | 0.0209 | 0.0067 | 1.040 | 0.6100 | 0.196 | 30.4 |

APPENDIX 13 (cont) Organ weights - individual values (g) - terminal sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Thymus | Thymus Body (%) | Thymus Brain (%) | Thyroids and Parathyroids | Thyroids and Parathyroids Body (%) | Thyroids and Parathyroids Brain (%) | Uterus and Cervix | Uterus and Cervix Body (%) | Uterus and Cervix Brain (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative to | | | | | | | | | | |
| 3F | 3501 | 0.3800 | 0.130 | 17.8 | 0.0178 | 0.0061 | 0.83 | 0.5880 | 0.201 | 27.6 |
| | 3502 | 0.3140 | 0.105 | 16.9 | 0.0148 | 0.0049 | 0.80 | 1.7040 | 0.568 | 91.8 |
| | 3503 | 0.3720 | 0.143 | 18.2 | 0.0142 | 0.0055 | 0.70 | 0.8010 | 0.309 | 39.2 |
| | 3504 | 0.3360 | 0.115 | 16.7 | 0.0158 | 0.0054 | 0.78 | 0.7240 | 0.247 | 35.9 |
| | 3505 | 0.2400 | 0.076 | 12.7 | 0.0228 | 0.0072 | 1.21 | 1.2250 | 0.390 | 65.0 |
| | 3506 | 0.3690 | 0.131 | 18.0 | 0.0204 | 0.0072 | 0.99 | 0.7920 | 0.280 | 38.6 |
| | 3507 | 0.4040 | 0.140 | 17.8 | 0.0173 | 0.0060 | 0.76 | 0.7450 | 0.259 | 32.8 |
| | 3508 | 1.2790 | 0.407 | 61.1 | 0.0188 | 0.0060 | 0.90 | 0.7420 | 0.236 | 35.5 |
| | 3509 | 0.3090 | 0.105 | 15.5 | 0.0187 | 0.0063 | 0.94 | 0.8880 | 0.301 | 44.7 |
| | 3510 | 0.3820 | 0.131 | 20.0 | 0.0215 | 0.0073 | 1.13 | 0.7440 | 0.254 | 39.0 |
| 4F | 4501 | 0.3040 | 0.120 | 16.3 | 0.0246 | 0.0097 | 1.32 | 1.5360 | 0.608 | 82.1 |
| | 4502 | 0.4000 | 0.140 | 18.3 | 0.0225 | 0.0079 | 1.03 | 1.1780 | 0.413 | 53.9 |
| | 4503 | 0.2760 | 0.096 | 13.8 | 0.0271 | 0.0094 | 1.36 | 0.7410 | 0.257 | 37.1 |
| | 4504 | 0.2520 | 0.101 | 12.2 | 0.0255 | 0.0102 | 1.23 | 0.9760 | 0.391 | 47.1 |
| | 4505 | 0.2790 | 0.112 | 14.1 | 0.0178 | 0.0072 | 0.90 | 1.2630 | 0.507 | 63.7 |
| | 4506 | 0.3790 | 0.126 | 18.8 | 0.0207 | 0.0069 | 1.03 | 0.6930 | 0.231 | 34.3 |
| | 4507 | 0.3710 | 0.142 | 17.6 | 0.0152 | 0.0058 | 0.72 | 1.2070 | 0.462 | 57.2 |
| | 4508 | 0.2670 | 0.092 | 12.6 | 0.0151 | 0.0052 | 0.71 | 0.6220 | 0.213 | 29.3 |
| | 4509 | 0.2680 | 0.094 | 14.1 | 0.0186 | 0.0065 | 0.98 | 1.1050 | 0.388 | 58.3 |
| | 4510 | 0.4420 | 0.142 | 22.0 | 0.0251 | 0.0081 | 1.25 | 1.3220 | 0.425 | 65.8 |

APPENDIX 13 Organ weights - individual values (g) - recovery sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Terminal Body weight | Adrenals | Adrenals Body (%) | Adrenals Brain (%) | Brain | Brain Body (%) | Epididymides | Epididymides Body (%) | Epididymides Brain (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative to | | | | | | | | | | |
| 1M | 1011 | 469.5 | 0.0562 | 0.0120 | 2.47 | 2.2753 | 0.485 | 1.4886 | 0.317 | 65.4 |
| | 1012 | 585.7 | 0.0655 | 0.0112 | 2.78 | 2.3575 | 0.403 | 1.9962 | 0.341 | 84.7 |
| | 1013 | 528.1 | 0.0521 | 0.0099 | 2.31 | 2.2510 | 0.426 | 1.5576 | 0.295 | 69.2 |
| | 1014 | 520.3 | 0.0574 | 0.0110 | 2.40 | 2.3903 | 0.459 | 1.4626 | 0.281 | 61.2 |
| | 1015 | 448.8 | 0.0437 | 0.0097 | 2.04 | 2.1419 | 0.477 | 1.9218 | 0.428 | 89.7 |
| | 1016 | 487.8 | 0.0403 | 0.0083 | 1.80 | 2.2424 | 0.460 | 1.5651 | 0.321 | 69.8 |
| | 1017 | 472.2 | 0.0591 | 0.0125 | 2.76 | 2.1432 | 0.454 | 1.6600 | 0.352 | 77.5 |
| | 1018 | 543.2 | 0.0661 | 0.0122 | 2.87 | 2.3063 | 0.425 | 1.5433 | 0.284 | 66.9 |
| | 1019 | 579.9 | 0.0552 | 0.0095 | 2.44 | 2.2639 | 0.390 | 1.7010 | 0.293 | 75.1 |
| | 1020 | 497.7 | 0.0716 | 0.0144 | 2.86 | 2.5068 | 0.504 | 1.4459 | 0.291 | 57.7 |
| 4M | 4011 | 572.7 | 0.0502 | 0.0088 | 2.21 | 2.2744 | 0.397 | 1.2953 | 0.226 | 57.0 |
| | 4012 | 464.1 | 0.0498 | 0.0107 | 2.32 | 2.1481 | 0.463 | 1.3208 | 0.285 | 61.5 |
| | 4013 | 390.0 | 0.0384 | 0.0098 | 1.82 | 2.1050 | 0.540 | 1.2404 | 0.318 | 58.9 |
| | 4014 | 495.4 | 0.0446 | 0.0090 | 2.08 | 2.1454 | 0.433 | 1.3062 | 0.264 | 60.9 |
| | 4015 | 437.9 | 0.0444 | 0.0101 | 2.15 | 2.0695 | 0.473 | 1.4200 | 0.324 | 68.6 |
| | 4016 | 454.2 | 0.0508 | 0.0112 | 2.31 | 2.1956 | 0.483 | 1.5509 | 0.341 | 70.6 |
| | 4017 | 524.8 | 0.0451 | 0.0086 | 2.02 | 2.2370 | 0.426 | 1.3860 | 0.264 | 62.0 |
| | 4018 | 560.0 | 0.0511 | 0.0091 | 2.24 | 2.2856 | 0.408 | 1.4250 | 0.254 | 62.3 |
| | 4019 | 513.0 | 0.0532 | 0.0104 | 2.27 | 2.3411 | 0.456 | 1.4267 | 0.278 | 60.9 |
| | 4020 | 532.4 | 0.0487 | 0.0091 | 2.10 | 2.3228 | 0.436 | 1.4740 | 0.277 | 63.5 |

APPENDIX 13 (cont) Organ weights - individual values (g) - recovery sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Heart | Heart | Heart | Kidneys | Kidneys | Kidneys | Liver | Liver | Liver |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative to | | | Body (%) | Brain (%) | | Body (%) | Brain (%) | | Body (%) | Brain (%) |
| 1M | 1011 | 1.5416 | 0.328 | 67.8 | 2.9460 | 0.627 | 129 | 9.9256 | 2.11 | 436 |
| | 1012 | 1.8315 | 0.313 | 77.7 | 3.9468 | 0.674 | 167 | 14.2800 | 2.44 | 606 |
| | 1013 | 1.4562 | 0.276 | 64.7 | 3.0011 | 0.568 | 133 | 9.9392 | 1.88 | 442 |
| | 1014 | 1.5154 | 0.291 | 63.4 | 3.2942 | 0.633 | 138 | 11.6317 | 2.24 | 487 |
| | 1015 | 1.3092 | 0.292 | 61.1 | 2.6735 | 0.596 | 125 | 9.7978 | 2.18 | 457 |
| | 1016 | 1.6030 | 0.329 | 71.5 | 2.6382 | 0.541 | 118 | 10.4876 | 2.15 | 468 |
| | 1017 | 1.9673 | 0.417 | 91.8 | 3.3554 | 0.711 | 157 | 11.4687 | 2.43 | 535 |
| | 1018 | 1.4925 | 0.275 | 64.7 | 2.9771 | 0.548 | 129 | 10.7773 | 1.98 | 467 |
| | 1019 | 1.6122 | 0.278 | 71.2 | 3.7408 | 0.645 | 165 | 12.4384 | 2.14 | 549 |
| | 1020 | 1.4396 | 0.289 | 57.4 | 3.0725 | 0.617 | 123 | 12.6616 | 2.54 | 505 |
| 4M | 4011 | 1.6403 | 0.286 | 72.1 | 3.3365 | 0.583 | 147 | 14.6012 | 2.55 | 642 |
| | 4012 | 1.4536 | 0.313 | 67.7 | 2.5701 | 0.554 | 120 | 9.5684 | 2.06 | 445 |
| | 4013 | 1.3173 | 0.338 | 62.6 | 2.1786 | 0.559 | 103 | 8.2647 | 2.12 | 393 |
| | 4014 | 1.4814 | 0.299 | 69.1 | 2.8180 | 0.569 | 131 | 10.5221 | 2.12 | 490 |
| | 4015 | 1.2383 | 0.283 | 59.8 | 2.7709 | 0.633 | 134 | 10.0759 | 2.30 | 487 |
| | 4016 | 1.6346 | 0.360 | 74.4 | 3.1735 | 0.699 | 145 | 10.3243 | 2.27 | 470 |
| | 4017 | 1.4183 | 0.270 | 63.4 | 2.9444 | 0.561 | 132 | 12.3788 | 2.36 | 553 |
| | 4018 | 1.7462 | 0.312 | 76.4 | 3.5434 | 0.633 | 155 | 14.2429 | 2.54 | 623 |
| | 4019 | 1.4048 | 0.274 | 60.0 | 3.3780 | 0.658 | 144 | 11.0997 | 2.16 | 474 |
| | 4020 | 1.9569 | 0.368 | 84.2 | 2.9442 | 0.553 | 127 | 11.2090 | 2.11 | 483 |

APPENDIX 13 (cont) Organ weights - individual values (g) - recovery sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Lungs and Bronchi | Lungs and Bronchi | Lungs and Bronchi | Pituitary | Pituitary | Pituitary | Spleen | Spleen | Spleen |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative to | | | Body (%) | Brain (%) | | Body (%) | Brain (%) | | Body (%) | Brain (%) |
| 1M | 1011 | 1.5859 | 0.338 | 69.7 | 0.0144 | 0.0031 | 0.633 | 0.7022 | 0.150 | 30.9 |
| | 1012 | 1.7136 | 0.293 | 72.7 | 0.0166 | 0.0028 | 0.704 | 1.1961 | 0.204 | 50.7 |
| | 1013 | 1.7581 | 0.333 | 78.1 | 0.0167 | 0.0032 | 0.742 | 1.0096 | 0.191 | 44.9 |
| | 1014 | 1.5602 | 0.300 | 65.3 | 0.0129 | 0.0025 | 0.540 | 1.0004 | 0.192 | 41.9 |
| | 1015 | 1.5768 | 0.351 | 73.6 | 0.0111 | 0.0025 | 0.518 | 0.6894 | 0.154 | 32.2 |
| | 1016 | 1.6105 | 0.330 | 71.8 | 0.0116 | 0.0024 | 0.517 | 0.8859 | 0.182 | 39.5 |
| | 1017 | 1.6423 | 0.348 | 76.6 | 0.0158 | 0.0033 | 0.737 | 1.0933 | 0.232 | 51.0 |
| | 1018 | 1.7813 | 0.328 | 77.2 | 0.0145 | 0.0027 | 0.629 | 0.7460 | 0.137 | 32.3 |
| | 1019 | 1.6077 | 0.277 | 71.0 | 0.0222 | 0.0038 | 0.981 | 1.1786 | 0.203 | 52.1 |
| | 1020 | 1.7082 | 0.343 | 68.1 | 0.0174 | 0.0035 | 0.694 | 0.9423 | 0.189 | 37.6 |
| 4M | 4011 | 1.5949 | 0.278 | 70.1 | 0.0170 | 0.0030 | 0.747 | 0.9229 | 0.161 | 40.6 |
| | 4012 | 1.5009 | 0.323 | 69.9 | 0.0152 | 0.0033 | 0.708 | 0.6844 | 0.147 | 31.9 |
| | 4013 | 1.3181 | 0.338 | 62.6 | 0.0123 | 0.0032 | 0.584 | 0.6254 | 0.160 | 29.7 |
| | 4014 | 1.4491 | 0.293 | 67.5 | 0.0191 | 0.0039 | 0.890 | 0.8056 | 0.163 | 37.6 |
| | 4015 | 1.4996 | 0.342 | 72.5 | 0.0136 | 0.0031 | 0.657 | 0.5982 | 0.137 | 28.9 |
| | 4016 | 1.5759 | 0.347 | 71.8 | 0.0151 | 0.0033 | 0.688 | 0.8749 | 0.193 | 39.8 |
| | 4017 | 1.7236 | 0.328 | 77.0 | 0.0136 | 0.0026 | 0.608 | 0.8731 | 0.166 | 39.0 |
| | 4018 | 1.6423 | 0.293 | 71.9 | 0.0133 | 0.0024 | 0.582 | 1.0763 | 0.192 | 47.1 |
| | 4019 | 1.6902 | 0.329 | 72.2 | 0.0177 | 0.0035 | 0.756 | 0.8891 | 0.173 | 38.0 |
| | 4020 | 1.6353 | 0.307 | 70.4 | 0.0145 | 0.0027 | 0.624 | 0.9110 | 0.171 | 39.2 |

APPENDIX 13 (cont) Organ weights - individual values (g) - recovery sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Testes | Testes | Testes | Thymus | Thymus | Thymus | Thyroids and Parathyroids | Thyroids and Parathyroids | Thyroids and Parathyroids |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative to | | | Body (%) | Brain (%) | | Body (%) | Brain (%) | | Body (%) | Brain (%) |
| 1M | 1011 | 3.6224 | 0.772 | 159 | 0.3855 | 0.0821 | 16.9 | 0.0285 | 0.0061 | 1.25 |
| | 1012 | 3.6190 | 0.618 | 154 | 0.2311 | 0.0395 | 9.8 | 0.0226 | 0.0039 | 0.96 |
| | 1013 | 3.6518 | 0.691 | 162 | 0.3445 | 0.0652 | 15.3 | 0.0239 | 0.0045 | 1.06 |
| | 1014 | 3.4546 | 0.664 | 145 | 0.6231 | 0.1198 | 26.1 | 0.0263 | 0.0051 | 1.10 |
| | 1015 | 3.9227 | 0.874 | 183 | 0.1748 | 0.0389 | 8.2 | 0.0274 | 0.0061 | 1.28 |
| | 1016 | 3.7819 | 0.775 | 169 | 0.4333 | 0.0888 | 19.3 | 0.0172 | 0.0035 | 0.77 |
| | 1017 | 3.4055 | 0.721 | 159 | 0.2304 | 0.0488 | 10.8 | 0.0176 | 0.0037 | 0.82 |
| | 1018 | 4.2665 | 0.785 | 185 | 0.2994 | 0.0551 | 13.0 | 0.0221 | 0.0041 | 0.96 |
| | 1019 | 3.7417 | 0.645 | 165 | 0.5897 | 0.1017 | 26.0 | 0.0205 | 0.0035 | 0.91 |
| | 1020 | 3.9032 | 0.784 | 156 | 0.2828 | 0.0568 | 11.3 | 0.0204 | 0.0041 | 0.81 |
| 4M | 4011 | 3.2735 | 0.572 | 144 | 0.1847 | 0.0323 | 8.1 | 0.0341 | 0.0060 | 1.50 |
| | 4012 | 3.4385 | 0.741 | 160 | 0.2410 | 0.0519 | 11.2 | 0.0242 | 0.0052 | 1.13 |
| | 4013 | 2.8639 | 0.734 | 136 | 0.2520 | 0.0646 | 12.0 | 0.0240 | 0.0062 | 1.14 |
| | 4014 | 3.7254 | 0.752 | 174 | 0.1651 | 0.0333 | 7.7 | 0.0305 | 0.0062 | 1.42 |
| | 4015 | 3.0474 | 0.696 | 147 | 0.2634 | 0.0602 | 12.7 | 0.0241 | 0.0055 | 1.16 |
| | 4016 | 3.3654 | 0.741 | 153 | 0.4772 | 0.1051 | 21.7 | 0.0188 | 0.0041 | 0.86 |
| | 4017 | 3.4447 | 0.656 | 154 | 0.3610 | 0.0688 | 16.1 | 0.0231 | 0.0044 | 1.03 |
| | 4018 | 3.6163 | 0.646 | 158 | 0.1920 | 0.0343 | 8.4 | 0.0248 | 0.0044 | 1.09 |
| | 4019 | 3.9623 | 0.772 | 169 | 0.2394 | 0.0467 | 10.2 | 0.0271 | 0.0053 | 1.16 |
| | 4020 | 4.0104 | 0.753 | 173 | 0.1723 | 0.0324 | 7.4 | 0.0166 | 0.0031 | 0.71 |

APPENDIX 13 (cont) Organ weights - individual values (g) - recovery sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Prostate and Seminal Vesicles | Prostate and Seminal Vesicles | Prostate and Seminal Vesicles |
|---|---|---|---|---|
| Relative to | | | Body (%) | Brain (%) |
| 1M | 1011 | 3.4017 | 0.725 | 150 |
| | 1012 | 3.7753 | 0.645 | 160 |
| | 1013 | 3.5669 | 0.675 | 158 |
| | 1014 | 3.4432 | 0.662 | 144 |
| | 1015 | 3.6629 | 0.816 | 171 |
| | 1016 | 3.3885 | 0.695 | 151 |
| | 1017 | 4.5714 | 0.968 | 213 |
| | 1018 | 4.1012 | 0.755 | 178 |
| | 1019 | 4.3149 | 0.744 | 191 |
| | 1020 | 3.9596 | 0.796 | 158 |
| 4M | 4011 | 3.6150 | 0.631 | 159 |
| | 4012 | 3.2873 | 0.708 | 153 |
| | 4013 | 3.4100 | 0.874 | 162 |
| | 4014 | 3.5615 | 0.719 | 166 |
| | 4015 | 3.3985 | 0.776 | 164 |
| | 4016 | 4.1482 | 0.913 | 189 |
| | 4017 | 3.9901 | 0.760 | 178 |
| | 4018 | 4.0687 | 0.727 | 178 |
| | 4019 | 4.4191 | 0.861 | 189 |
| | 4020 | 4.3723 | 0.821 | 188 |

APPENDIX 13 (cont) Organ weights - individual values (g) - recovery sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Terminal Body weight | Adrenals | Adrenals Body (%) | Adrenals Brain (%) | Brain | Brain Body (%) | Heart | Heart Body (%) | Heart Brain (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative to | | | | | | | | | | |
| 1F | 1511 | 308.3 | 0.0611 | 0.0198 | 2.93 | 2.0843 | 0.676 | 0.9370 | 0.304 | 45.0 |
| | 1512 | 279.3 | 0.0484 | 0.0173 | 2.43 | 1.9938 | 0.714 | 1.0116 | 0.362 | 50.7 |
| | 1513 | 291.6 | 0.0519 | 0.0178 | 2.41 | 2.1502 | 0.737 | 0.9696 | 0.333 | 45.1 |
| | 1514 | 352.6 | 0.0635 | 0.0180 | 3.14 | 2.0204 | 0.573 | 0.9984 | 0.283 | 49.4 |
| | 1515 | 314.2 | 0.0548 | 0.0174 | 2.61 | 2.0989 | 0.668 | 1.0851 | 0.345 | 51.7 |
| | 1516 | 300.7 | 0.0466 | 0.0155 | 2.24 | 2.0780 | 0.691 | 0.8686 | 0.289 | 41.8 |
| | 1517 | 337.3 | 0.0494 | 0.0146 | 2.62 | 1.8848 | 0.559 | 0.9718 | 0.288 | 51.6 |
| | 1518 | 283.5 | 0.0592 | 0.0209 | 2.92 | 2.0289 | 0.716 | 0.9703 | 0.342 | 47.8 |
| | 1519 | 289.2 | 0.0604 | 0.0209 | 2.88 | 2.0944 | 0.724 | 1.1030 | 0.381 | 52.7 |
| | 1520 | 334.7 | 0.0743 | 0.0222 | 3.62 | 2.0512 | 0.613 | 1.1207 | 0.335 | 54.6 |
| 4F | 4511 | 286.1 | 0.0544 | 0.0190 | 2.82 | 1.9323 | 0.675 | 0.9245 | 0.323 | 47.8 |
| | 4512 | 351.0 | 0.0561 | 0.0160 | 2.65 | 2.1135 | 0.602 | 1.1853 | 0.338 | 56.1 |
| | 4513 | 314.1 | 0.0647 | 0.0206 | 3.15 | 2.0560 | 0.655 | 1.3304 | 0.424 | 64.7 |
| | 4514 | 290.5 | 0.0610 | 0.0210 | 3.01 | 2.0296 | 0.699 | 1.2821 | 0.441 | 63.2 |
| | 4515 | 306.6 | 0.0654 | 0.0213 | 3.34 | 1.9581 | 0.639 | 1.0229 | 0.334 | 52.2 |
| | 4516 | 303.6 | 0.0412 | 0.0136 | 1.79 | 2.2969 | 0.757 | 1.1944 | 0.393 | 52.0 |
| | 4517 | 278.2 | 0.0507 | 0.0182 | 2.49 | 2.0340 | 0.731 | 1.2518 | 0.450 | 61.5 |
| | 4518 | 287.1 | 0.0531 | 0.0185 | 2.60 | 2.0385 | 0.710 | 0.9018 | 0.314 | 44.2 |
| | 4519 | 282.6 | 0.0566 | 0.0200 | 2.74 | 2.0666 | 0.731 | 1.1648 | 0.412 | 56.4 |
| | 4520 | 305.2 | 0.0631 | 0.0207 | 2.89 | 2.1803 | 0.714 | 1.5193 | 0.498 | 69.7 |

APPENDIX 13 (cont) Organ weights - individual values (g) - recovery sacrifice

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Kidneys | Kidneys | Kidneys | Liver | Liver | Liver | Lungs and Bronchi | Lungs and Bronchi | Lungs and Bronchi |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative to | | | Body (%) | Brain (%) | | Body (%) | Brain (%) | | Body (%) | Brain (%) |
| 1F | 1511 | 1.7993 | 0.584 | 86.3 | 7.2972 | 2.37 | 350 | 1.2664 | 0.411 | 60.8 |
| | 1512 | 1.7244 | 0.617 | 86.5 | 7.5118 | 2.69 | 377 | 1.1467 | 0.411 | 57.5 |
| | 1513 | 2.1033 | 0.721 | 97.8 | 7.7791 | 2.67 | 362 | 1.3401 | 0.460 | 62.3 |
| | 1514 | 1.9169 | 0.544 | 94.9 | 7.8185 | 2.22 | 387 | 1.2091 | 0.343 | 59.8 |
| | 1515 | 1.9153 | 0.610 | 91.3 | 7.6540 | 2.44 | 365 | 1.2788 | 0.407 | 60.9 |
| | 1516 | 1.8951 | 0.630 | 91.2 | 6.9585 | 2.31 | 335 | 1.3386 | 0.445 | 64.4 |
| | 1517 | 1.9576 | 0.580 | 103.9 | 7.3696 | 2.18 | 391 | 1.4132 | 0.419 | 75.0 |
| | 1518 | 1.7843 | 0.629 | 87.9 | 6.4185 | 2.26 | 316 | 1.2368 | 0.436 | 61.0 |
| | 1519 | 1.6937 | 0.586 | 80.9 | 6.4548 | 2.23 | 308 | 1.1940 | 0.413 | 57.0 |
| | 1520 | 1.9614 | 0.586 | 95.6 | 8.6634 | 2.59 | 422 | 1.2679 | 0.379 | 61.8 |
| 4F | 4511 | 1.9893 | 0.695 | 102.9 | 7.0425 | 2.46 | 364 | 1.1047 | 0.386 | 57.2 |
| | 4512 | 2.3770 | 0.677 | 112.5 | 8.5848 | 2.45 | 406 | 1.6302 | 0.464 | 77.1 |
| | 4513 | 2.2828 | 0.727 | 111.0 | 8.1397 | 2.59 | 396 | 1.4680 | 0.467 | 71.4 |
| | 4514 | 2.3019 | 0.792 | 113.4 | 7.2620 | 2.50 | 358 | 1.3412 | 0.462 | 66.1 |
| | 4515 | 1.9579 | 0.639 | 100.0 | 7.2501 | 2.36 | 370 | 1.2861 | 0.419 | 65.7 |
| | 4516 | 2.1794 | 0.718 | 94.9 | 7.9074 | 2.60 | 344 | 1.3402 | 0.441 | 58.3 |
| | 4517 | 1.8744 | 0.674 | 92.2 | 7.0910 | 2.55 | 349 | 1.3408 | 0.482 | 65.9 |
| | 4518 | 1.6384 | 0.571 | 80.4 | 6.3896 | 2.23 | 313 | 1.3027 | 0.454 | 63.9 |
| | 4519 | 2.0396 | 0.722 | 98.7 | 6.6767 | 2.36 | 323 | 1.3317 | 0.471 | 64.4 |
| | 4520 | 1.9660 | 0.644 | 90.2 | 8.0237 | 2.63 | 368 | 1.4703 | 0.482 | 67.4 |

APPENDIX 13 (cont) Organ weights - individual values (g) - recovery sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Ovaries | Ovaries | Ovaries | Pituitary | Pituitary | Pituitary | Spleen | Spleen | Spleen |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative to | | | Body (%) | Brain (%) | | Body (%) | Brain (%) | | Body (%) | Brain (%) |
| 1F | 1511 | 0.0833 | 0.0270 | 4.00 | 0.0212 | 0.0069 | 1.02 | 0.5190 | 0.168 | 24.9 |
| | 1512 | 0.0722 | 0.0259 | 3.62 | 0.0170 | 0.0061 | 0.85 | 0.4631 | 0.166 | 23.2 |
| | 1513 | 0.0702 | 0.0241 | 3.26 | 0.0224 | 0.0077 | 1.04 | 0.6746 | 0.231 | 31.4 |
| | 1514 | 0.1148 | 0.0326 | 5.68 | 0.0205 | 0.0058 | 1.01 | 0.4934 | 0.140 | 24.4 |
| | 1515 | 0.0762 | 0.0243 | 3.63 | 0.0167 | 0.0053 | 0.80 | 0.5090 | 0.162 | 24.3 |
| | 1516 | 0.0813 | 0.0270 | 3.91 | 0.0245 | 0.0081 | 1.18 | 0.6599 | 0.219 | 31.8 |
| | 1517 | 0.0892 | 0.0264 | 4.73 | 0.0238 | 0.0071 | 1.26 | 0.5939 | 0.176 | 31.5 |
| | 1518 | 0.0885 | 0.0312 | 4.36 | 0.0157 | 0.0055 | 0.77 | 0.4715 | 0.166 | 23.2 |
| | 1519 | 0.0688 | 0.0238 | 3.28 | 0.0172 | 0.0059 | 0.82 | 0.5191 | 0.179 | 24.8 |
| | 1520 | 0.1008 | 0.0301 | 4.91 | 0.0252 | 0.0075 | 1.23 | 0.7112 | 0.212 | 34.7 |
| 4F | 4511 | 0.0896 | 0.0313 | 4.64 | 0.0196 | 0.0069 | 1.01 | 0.5871 | 0.205 | 30.4 |
| | 4512 | 0.0834 | 0.0238 | 3.95 | 0.0195 | 0.0056 | 0.92 | 0.9010 | 0.257 | 42.6 |
| | 4513 | 0.0896 | 0.0285 | 4.36 | 0.0250 | 0.0080 | 1.22 | 0.7754 | 0.247 | 37.7 |
| | 4514 | 0.0881 | 0.0303 | 4.34 | 0.0179 | 0.0062 | 0.88 | 0.7210 | 0.248 | 35.5 |
| | 4515 | 0.0865 | 0.0282 | 4.42 | 0.0216 | 0.0070 | 1.10 | 0.5276 | 0.172 | 26.9 |
| | 4516 | 0.1244 | 0.0410 | 5.42 | 0.0290 | 0.0096 | 1.26 | 0.6643 | 0.219 | 28.9 |
| | 4517 | 0.0813 | 0.0292 | 4.00 | 0.0251 | 0.0090 | 1.23 | 0.6125 | 0.220 | 30.1 |
| | 4518 | 0.0715 | 0.0249 | 3.51 | 0.0230 | 0.0080 | 1.13 | 0.5221 | 0.182 | 25.6 |
| | 4519 | 0.1031 | 0.0365 | 4.99 | 0.0248 | 0.0088 | 1.20 | 0.6052 | 0.214 | 29.3 |
| | 4520 | 0.0888 | 0.0291 | 4.07 | 0.0156 | 0.0051 | 0.72 | 0.5520 | 0.181 | 25.3 |

APPENDIX 13 (cont) Organ weights - individual values (g) - recovery sacrifice

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Thymus | Thymus Body (%) | Thymus Brain (%) | Thyroids and Parathyroids | Thyroids and Parathyroids Body (%) | Thyroids and Parathyroids Brain (%) | Uterus and Cervix | Uterus and Cervix Body (%) | Uterus and Cervix Brain (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative to | | | | | | | | | | |
| 1F | 1511 | 0.2488 | 0.0807 | 11.9 | 0.0283 | 0.0092 | 1.36 | 1.0612 | 0.344 | 50.9 |
| | 1512 | 0.2944 | 0.1054 | 14.8 | 0.0260 | 0.0093 | 1.30 | 1.3093 | 0.469 | 65.7 |
| | 1513 | 0.2133 | 0.0731 | 9.9 | 0.0273 | 0.0094 | 1.27 | 1.6922 | 0.580 | 78.7 |
| | 1514 | 0.3726 | 0.1057 | 18.4 | 0.0236 | 0.0067 | 1.17 | 0.5931 | 0.168 | 29.4 |
| | 1515 | 0.1756 | 0.0559 | 8.4 | 0.0232 | 0.0074 | 1.11 | 1.6707 | 0.532 | 79.6 |
| | 1516 | 0.2310 | 0.0768 | 11.1 | 0.0242 | 0.0080 | 1.16 | 0.5943 | 0.198 | 28.6 |
| | 1517 | 0.2585 | 0.0766 | 13.7 | 0.0188 | 0.0056 | 1.00 | 0.8460 | 0.251 | 44.9 |
| | 1518 | 0.2523 | 0.0890 | 12.4 | 0.0210 | 0.0074 | 1.04 | 0.5742 | 0.203 | 28.3 |
| | 1519 | 0.2323 | 0.0803 | 11.1 | 0.0191 | 0.0066 | 0.91 | 0.9562 | 0.331 | 45.7 |
| | 1520 | 0.1916 | 0.0572 | 9.3 | 0.0298 | 0.0089 | 1.45 | 0.9301 | 0.278 | 45.3 |
| 4F | 4511 | 0.2648 | 0.0926 | 13.7 | 0.0175 | 0.0061 | 0.91 | 0.4787 | 0.167 | 24.8 |
| | 4512 | 0.5090 | 0.1450 | 24.1 | 0.0275 | 0.0078 | 1.30 | 0.9059 | 0.258 | 42.9 |
| | 4513 | 0.2215 | 0.0705 | 10.8 | 0.0160 | 0.0051 | 0.78 | 0.6872 | 0.219 | 33.4 |
| | 4514 | 0.2631 | 0.0906 | 13.0 | 0.0229 | 0.0079 | 1.13 | 0.8085 | 0.278 | 39.8 |
| | 4515 | 0.2098 | 0.0684 | 10.7 | 0.0217 | 0.0071 | 1.11 | 0.7609 | 0.248 | 38.9 |
| | 4516 | 0.3997 | 0.1317 | 17.4 | 0.0301 | 0.0099 | 1.31 | 0.8332 | 0.274 | 36.3 |
| | 4517 | 0.1946 | 0.0699 | 9.6 | 0.0217 | 0.0078 | 1.07 | 0.8082 | 0.291 | 39.7 |
| | 4518 | 0.2269 | 0.0790 | 11.1 | 0.0214 | 0.0075 | 1.05 | 0.7230 | 0.252 | 35.5 |
| | 4519 | 0.3850 | 0.1362 | 18.6 | 0.0188 | 0.0067 | 0.91 | 0.8142 | 0.288 | 39.4 |
| | 4520 | 0.2904 | 0.0952 | 13.3 | 0.0234 | 0.0077 | 1.07 | 0.9940 | 0.326 | 45.6 |

APPENDIX 14 Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1M | 1001S1 | 92 (14) | Treatment | Lymph Node, Tracheobronchial: No macropathology findings | Lymph Node, Tracheobronchial: insufficient, could not be evaluated |
| | | | | Prostate: No macropathology findings | Prostate: Infiltrate, Inflammatory Cell, minimal, mixed |
| | | | | Tracheal Bifurcation: No macropathology findings | Tracheal Bifurcation: insufficient, could not be evaluated<br>Note: Epithelium at point of bifurcation not present |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Epididymides; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Kidneys; Lacrimal Glands; Larynx; Liver; Lungs and Bronchi; Lymph Node, Axillary; Lymph Node, Mesenteric; Mammary; Nerve, Sciatic; Nose/Turbinates; Pancreas; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Salivary Gland, Mandibular; Seminal Vesicles; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Testes; Thymus; Thyroids; Trachea; Urinary Bladder

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1M | 1002S1 | 92 (14) | Treatment | | Eyes: one of a pair, insufficient, could not be evaluated |
| | | | | Eyes: No macropathology findings | Eyes: No histopathology findings |
| | | | | Kidneys: No macropathology findings | Kidneys: Nephropathy, Chronic Progressive, minimal, unilateral |
| | | | | Lungs and Bronchi: No macropathology findings | Lungs and Bronchi: Metaplasia, Osseous, Alveolar, minimal<br>Lungs and Bronchi: Infiltrate, Inflammatory Cell, minimal, mononuclear cell |
| | | | | Lymph Node, Tracheobronchial: No macropathology findings | Lymph Node, Tracheobronchial: tissue missing |
| | | | | Tracheal Bifurcation: No macropathology findings | Tracheal Bifurcation: insufficient, could not be evaluated<br>Note: Epithelium at point of bifurcation not present |

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1M | 1002S1 | 92 (14) | Treatment | | |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Epididymides; Esophagus; Harderian Glands; Heart; Ileum; Jejunum; Lacrimal Glands; Larynx; Liver; Lymph Node, Axillary; Lymph Node, Mesenteric; Mammary; Nerve, Sciatic; Nose/Turbinates; Pancreas; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Prostate; Salivary Gland, Mandibular; Seminal Vesicles; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Testes; Thymus; Thyroids; Trachea; Urinary Bladder

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1M | 1003S1 | 92 (14) | Treatment | Eyes: No macropathology findings | Eyes: Rosettes/Folds, Retina, minimal, unilateral |
| | | | | Prostate: No macropathology findings | Prostate: Infiltrate, Inflammatory Cell, minimal, mixed |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Epididymides; Esophagus; Harderian Glands; Heart; Ileum; Jejunum; Kidneys; Lacrimal Glands; Larynx; Liver; Lungs and Bronchi; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Pancreas; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Salivary Gland, Mandibular; Seminal Vesicles; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Testes; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1M | 1004S1 | 92 (14) | Treatment | Lymph Node, Tracheobronchial: No macropathology findings | Lymph Node, Tracheobronchial: tissue missing |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Epididymides; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Kidneys; Lacrimal Glands; Larynx; Liver; Lungs and Bronchi; Lymph Node, Axillary; Lymph Node, Mesenteric; Mammary; Nerve, Sciatic; Nose/Turbinates; Pancreas; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Prostate; Salivary Gland, Mandibular; Seminal Vesicles; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Testes; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1M | 1005S1 | 92 (14) | Treatment | Heart: No macropathology findings | Heart: Cardiomyopathy, Chronic, minimal |
| | | | | Kidneys: No macropathology findings | Kidneys: Nephropathy, Chronic Progressive, minimal, bilateral |
| | | | | Peyer's Patches/GALT: No macropathology findings | Peyer's Patches/GALT: Mineralization, slight |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Epididymides; Esophagus; Eyes; Harderian Glands; Ileum; Jejunum; Lacrimal Glands; Larynx; Liver; Lungs and Bronchi; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Pancreas; Parathyroids; Pharynx, Nasal; Pituitary; Prostate; Salivary Gland, Mandibular; Seminal Vesicles; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Testes; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1M | 1006S1 | 92 (14) | Treatment | Harderian Glands: No macropathology findings | Harderian Glands: Infiltrate, Inflammatory Cell, minimal, bilateral, mononuclear cell |
| | | | | Lungs and Bronchi: No macropathology findings | Lungs and Bronchi: Infiltrate, Inflammatory Cell, minimal, mononuclear cell<br>Lungs and Bronchi: Alveolar Macrophage Aggregation, minimal |
| | | | | Lymph Node, Tracheobronchial: No macropathology findings | Lymph Node, Tracheobronchial: tissue missing |
| | | | | Parathyroids: No macropathology findings | Parathyroids: both, tissue missing |
| | | | | Tracheal Bifurcation: No macropathology findings | Tracheal Bifurcation: insufficient, could not be evaluated<br>Note: Epithelium at point of bifurcation not present |

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1M | 1006S1 | 92 (14) | Treatment | | |
| Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments: Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Epididymides; Esophagus; Eyes; Heart; Ileum; Jejunum; Kidneys; Lacrimal Glands; Larynx; Liver; Lymph Node, Axillary; Lymph Node, Mesenteric; Mammary; Nerve, Sciatic; Nose/Turbinates; Pancreas; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Prostate; Salivary Gland, Mandibular; Seminal Vesicles; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Testes; Thymus; Thyroids; Trachea; Urinary Bladder | | | | | |

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1M | 1007S1 | 92 (14) | Treatment | All tissues: No macropathology findings | All examined tissues: No histopathology findings |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Epididymides; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Kidneys; Lacrimal Glands; Larynx; Liver; Lungs and Bronchi; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Pancreas; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Prostate; Salivary Gland, Mandibular; Seminal Vesicles; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Testes; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1M | 1008S1 | 92 (14) | Treatment | Larynx: No macropathology findings | Larynx: No histopathology findings<br>Note: Epithelium at base of epiglottis not present |
| | | | | Liver: No macropathology findings | Liver: Infiltrate, Inflammatory Cell, minimal, mononuclear cell |
| | | | | Lymph Node, Axillary: No macropathology findings | Lymph Node, Axillary: tissue missing |
| | | | | Tracheal Bifurcation: No macropathology findings | Tracheal Bifurcation: Loss of Cilia/Epithelial Thinning, Point of Bifurcation, minimal |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Epididymides; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Kidneys; Lacrimal Glands; Lungs and Bronchi; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Pancreas; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Prostate; Salivary Gland, Mandibular; Seminal Vesicles; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Testes; Thymus; Thyroids; Trachea; Urinary Bladder

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1M | 1009S1 | 92 (14) | Treatment | Larynx: No macropathology findings | Larynx: insufficient, could not be evaluated |
| | | | | Lungs and Bronchi: No macropathology findings | Lungs and Bronchi: Alveolar Macrophage Aggregation, minimal |
| | | | | Parathyroids: No macropathology findings | Parathyroids: one of a pair, tissue missing<br>Parathyroids: No histopathology findings |
| | | | | Prostate: No macropathology findings | Prostate: Infiltrate, Inflammatory Cell, minimal, mixed |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Epididymides; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Kidneys; Lacrimal Glands; Liver; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Pancreas; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Salivary Gland, Mandibular; Seminal Vesicles; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Testes; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | | Histopathology findings |
|---|---|---|---|---|---|---|
| 1M | 1010S1 | 92 (14) | Treatment | Liver: No macropathology findings | | Liver: Infiltrate, Inflammatory Cell, minimal, mononuclear cell |
| | | | | Lungs and Bronchi: No macropathology findings | | Lungs and Bronchi: Infiltrate, Inflammatory Cell, minimal, mononuclear cell |
| | | | | Parathyroids: No macropathology findings | | Parathyroids: one of a pair, tissue missing<br>Parathyroids: No histopathology findings |
| | | | | Prostate: No macropathology findings | | Prostate: Infiltrate, Inflammatory Cell, minimal, mixed |
| | | | | Skin and Subcutis: Scab(s), dorsocranial, left, red, </=1mm, 1 (one) | = | Skin and Subcutis: Scab(s), slight |
| | | | | Tracheal Bifurcation: No macropathology findings | | Tracheal Bifurcation: Loss of Cilia/Epithelial Thinning, Point of Bifurcation, minimal |

= - correlation of macropathology to histopathology finding, S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1M | 1010S1 | 92 (14) | Treatment | | |
| Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments: Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Epididymides; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Kidneys; Lacrimal Glands; Larynx; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Pancreas; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Salivary Gland, Mandibular; Seminal Vesicles; Skeletal muscle, Rectus femoris; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Testes; Thymus; Thyroids; Trachea; Urinary Bladder | | | | | |

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1M | 1011Z1 | R30 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1M | 1012Z1 | R30 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1M | 1013Z1 | R30 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1M | 1014Z1 | R30 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1M | 1015Z1 | R30 (R5) | Recovery | Lungs and Bronchi: Adhesions, right caudal lobe, (adheared to accesory lobe.) | = Lungs and Bronchi: Adhesions, minimal |

Tissues without comments under macropathology findings were within normal limits at necropsy.

= - correlation of macropathology to histopathology finding, Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1M | 1016Z1 | R30 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1M | 1017Z1 | R30 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1M | 1018Z1 | R30 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1M | 1019Z1 | R30 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1M | 1020Z1 | R30 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 2M | 2001S1 | 92 (14) | Treatment | Stomach: Dark area(s), non glandular mucosa, red, 2-9mm, 1 (one) | Examined, not correlated |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Stomach

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 2M | 2002S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 2M | 2003S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 2M | 2004S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 2M | 2005S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 2M | 2006S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 2M | 2007S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 2M | 2008S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 2M | 2009S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 2M | 2010S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | | Histopathology findings |
|---|---|---|---|---|---|---|
| 3M | 3001S1 | 92 (14) | Treatment | Epididymides: Soft, bilateral, noted | = | Epididymides: Sperm, Reduced, Luminal, moderate, bilateral |
| | | | | Testes: Soft, bilateral, noted | = | Testes: Degeneration/Atrophy, Tubular, moderate, bilateral<br>Testes: Inflammation, slight, bilateral, mixed |

Tissues without comments under macropathology findings were within normal limits at necropsy.

= - correlation of macropathology to histopathology finding, S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 3M | 3002S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 3M | 3003S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 3M | 3004S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 3M | 3005S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 3M | 3006S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 3M | 3007S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 3M | 3008S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 3M | 3009S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 3M | 3010S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4M | 4001S1 | 92 (14) | Treatment | Kidneys: No macropathology findings | Kidneys: Accumulation, Hyaline Droplets, slight, bilateral (consistent with alpha2u-globulin nephropathy and characterized by eosinophilic, cytoplasmic droplets in the proximal tubules in the cortex, exfoliation of sporadic cells into tubular lumens, and formation of granular casts at the junction of the outer and inner stripes of the outer medulla) |
| | | | | Lungs and Bronchi: No macropathology findings | Lungs and Bronchi: Metaplasia, Osseous, Alveolar, minimal<br>Lungs and Bronchi: Infiltrate, Inflammatory Cell, minimal, mononuclear cell |
| | | | | Parathyroids: No macropathology findings | Parathyroids: one of a pair, tissue missing<br>Parathyroids: No histopathology findings |

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4M | 4001S1 | 92 (14) | Treatment | | |
| Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments: Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Epididymides; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Lacrimal Glands; Larynx; Liver; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Pancreas; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Prostate; Salivary Gland, Mandibular; Seminal Vesicles; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Testes; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder | | | | | |

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4M | 4002S1 | 92 (14) | Treatment | Kidneys: No macropathology findings | Kidneys: Accumulation, Hyaline Droplets, slight, bilateral |
| | | | | Lungs and Bronchi: No macropathology findings | Lungs and Bronchi: Infiltrate, Inflammatory Cell, minimal, mononuclear cell<br>Lungs and Bronchi: Alveolar Macrophage Aggregation, minimal |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Epididymides; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Lacrimal Glands; Larynx; Liver; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Pancreas; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Prostate; Salivary Gland, Mandibular; Seminal Vesicles; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Testes; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4M | 4003S1 | 92 (14) | Treatment | Kidneys: No macropathology findings | Kidneys: Nephropathy, Chronic Progressive, minimal, bilateral<br>Kidneys: Accumulation, Hyaline Droplets, slight, bilateral |
| | | | | Lungs and Bronchi: No macropathology findings | Lungs and Bronchi: Infiltrate, Inflammatory Cell, minimal, neutrophilic |
| | | | | Pancreas: No macropathology findings | Pancreas: Infiltrate, Inflammatory Cell, minimal, mononuclear cell |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Epididymides; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Lacrimal Glands; Larynx; Liver; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Prostate; Salivary Gland, Mandibular; Seminal Vesicles; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Testes; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4M | 4004S1 | 92 (14) | Treatment | Kidneys: No macropathology findings | Kidneys: Nephropathy, Chronic Progressive, slight, bilateral<br>Kidneys: Accumulation, Hyaline Droplets, moderate, bilateral |
| | | | | | Parathyroids: one of a pair, insufficient, could not be evaluated |
| | | | | Parathyroids: No macropathology findings | Parathyroids: No histopathology findings |
| | | | | Prostate: No macropathology findings | Prostate: Infiltrate, Inflammatory Cell, minimal, mixed |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Epididymides; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Lacrimal Glands; Larynx; Liver; Lungs and Bronchi; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Pancreas; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Salivary Gland, Mandibular; Seminal Vesicles; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Testes; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4M | 4005S1 | 92 (14) | Treatment | Heart: No macropathology findings | Heart: Cardiomyopathy, Chronic, minimal |
| | | | | Kidneys: No macropathology findings | Kidneys: Nephropathy, Chronic Progressive, slight, bilateral<br>Kidneys: Accumulation, Hyaline Droplets, slight, bilateral |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Epididymides; Esophagus; Eyes; Harderian Glands; Ileum; Jejunum; Lacrimal Glands; Larynx; Liver; Lungs and Bronchi; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Pancreas; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Prostate; Salivary Gland, Mandibular; Seminal Vesicles; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Testes; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4M | 4006S1 | 92 (14) | Treatment | Kidneys: No macropathology findings | Kidneys: Nephropathy, Chronic Progressive, slight, bilateral<br>Kidneys: Accumulation, Hyaline Droplets, moderate, bilateral |
| | | | | Lymph Node, Tracheobronchial: No macropathology findings | Lymph Node, Tracheobronchial: tissue missing |
| | | | | Parathyroids: No macropathology findings | Parathyroids: one of a pair, tissue missing<br>Parathyroids: No histopathology findings |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Epididymides; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Lacrimal Glands; Larynx; Liver; Lungs and Bronchi; Lymph Node, Axillary; Lymph Node, Mesenteric; Mammary; Nerve, Sciatic; Nose/Turbinates; Pancreas; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Prostate; Salivary Gland, Mandibular; Seminal Vesicles; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Testes; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4M | 4007S1 | 92 (14) | Treatment | Harderian Glands: No macropathology findings | Harderian Glands: Infiltrate, Inflammatory Cell, minimal, bilateral, mononuclear cell |
| | | | | Heart: No macropathology findings | Heart: Cardiomyopathy, Chronic, minimal |
| | | | | Kidneys: No macropathology findings | Kidneys: Nephropathy, Chronic Progressive, slight, bilateral<br>Kidneys: Accumulation, Hyaline Droplets, slight, bilateral |
| | | | | Lymph Node, Tracheobronchial: No macropathology findings | Lymph Node, Tracheobronchial: insufficient, could not be evaluated |
| | | | | Prostate: No macropathology findings | Prostate: Infiltrate, Inflammatory Cell, minimal, mixed |

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4M | 4007S1 | 92 (14) | Treatment | | |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Epididymides; Esophagus; Eyes; Ileum; Jejunum; Lacrimal Glands; Larynx; Liver; Lungs and Bronchi; Lymph Node, Axillary; Lymph Node, Mesenteric; Mammary; Nerve, Sciatic; Nose/Turbinates; Pancreas; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Salivary Gland, Mandibular; Seminal Vesicles; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Testes; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4M | 4008S1 | 92 (14) | Treatment | Kidneys: No macropathology findings | Kidneys: Accumulation, Hyaline Droplets, minimal, bilateral |
| | | | | Lungs and Bronchi: No macropathology findings | Lungs and Bronchi: Infiltrate, Inflammatory Cell, minimal, mononuclear cell |
| | | | | Tracheal Bifurcation: No macropathology findings | Tracheal Bifurcation: insufficient, could not be evaluated<br>Note: Epithelium at point of bifurcation not present |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Epididymides; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Lacrimal Glands; Larynx; Liver; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Pancreas; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Prostate; Salivary Gland, Mandibular; Seminal Vesicles; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Testes; Thymus; Thyroids; Trachea; Urinary Bladder

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4M | 4009S1 | 92 (14) | Treatment | Kidneys: No macropathology findings | Kidneys: Nephropathy, Chronic Progressive, slight, bilateral<br>Kidneys: Accumulation, Hyaline Droplets, slight, bilateral |
| | | | | Tracheal Bifurcation: No macropathology findings | Tracheal Bifurcation: Loss of Cilia/Epithelial Thinning, Point of Bifurcation, minimal |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Epididymides; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Lacrimal Glands; Larynx; Liver; Lungs and Bronchi; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Pancreas; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Prostate; Salivary Gland, Mandibular; Seminal Vesicles; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Testes; Thymus; Thyroids; Trachea; Urinary Bladder

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4M | 4010S1 | 92 (14) | Treatment | Kidneys: No macropathology findings | Kidneys: Nephropathy, Chronic Progressive, minimal, bilateral<br>Kidneys: Accumulation, Hyaline Droplets, slight, bilateral |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Epididymides; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Lacrimal Glands; Larynx; Liver; Lungs and Bronchi; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Pancreas; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Prostate; Salivary Gland, Mandibular; Seminal Vesicles; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Testes; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4M | 4011Z1 | R30 (R5) | Recovery | Kidneys: Depression(s), right, 2-9mm, 1 (one) | Examined, not correlated<br>Kidneys: Nephropathy, Chronic Progressive, minimal, unilateral<br>Kidneys: Accumulation, Hyaline Droplets, minimal, unilateral |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4M | 4012Z1 | R30 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4M | 4013Z1 | R30 (R5) | Recovery | Thyroids: Small, right | Examined, not correlated |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Thyroids

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4M | 4014Z1 | R30 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4M | 4015Z1 | R30 (R5) | Recovery | Thyroids: Small, right | Examined, not correlated |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Thyroids

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4M | 4016Z1 | R30 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4M | 4017Z1 | R30 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4M | 4018Z1 | R30 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4M | 4019Z1 | R30 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4M | 4020Z1 | R30 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1F | 1501S1 | 92 (14) | Treatment | Colon: No macropathology findings | Colon: Parasites, minimal |
| | | | | Lymph Node, Tracheobronchial: No macropathology findings | Lymph Node, Tracheobronchial: insufficient, could not be evaluated |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Duodenum; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Kidneys; Lacrimal Glands; Larynx; Liver; Lungs and Bronchi; Lymph Node, Axillary; Lymph Node, Mesenteric; Mammary; Nerve, Sciatic; Nose/Turbinates; Ovaries; Pancreas; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Salivary Gland, Mandibular; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder; Uterus and Cervix; Vagina

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1F | 1502S1 | 92 (14) | Treatment | | Parathyroids: one of a pair, tissue missing |
| | | | | Parathyroids: No macropathology findings | Parathyroids: No histopathology findings |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Kidneys; Lacrimal Glands; Larynx; Liver; Lungs and Bronchi; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Ovaries; Pancreas; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Salivary Gland, Mandibular; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder; Uterus and Cervix; Vagina

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1F | 1503S1 | 92 (14) | Treatment | Kidneys: No macropathology findings | Kidneys: Infiltrate, Inflammatory Cell, minimal, unilateral, mononuclear cell |
| | | | | Larynx: No macropathology findings | Larynx: No histopathology findings<br>Note: Epithelium at base of epiglottis not present |
| | | | | Lymph Node, Tracheobronchial: No macropathology findings | Lymph Node, Tracheobronchial: tissue missing |
| | | | | Tracheal Bifurcation: No macropathology findings | Tracheal Bifurcation: insufficient, could not be evaluated<br>Note: Epithelium at point of bifurcation not present |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Lacrimal Glands; Liver; Lungs and Bronchi; Lymph Node, Axillary; Lymph Node, Mesenteric; Mammary; Nerve, Sciatic; Nose/Turbinates; Ovaries; Pancreas; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Salivary Gland, Mandibular; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Thymus; Thyroids; Trachea; Urinary Bladder; Uterus and Cervix; Vagina

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1F | 1504S1 | 92 (14) | Treatment | Lungs and Bronchi: No macropathology findings | Lungs and Bronchi: Alveolar Macrophage Aggregation, minimal |
| | | | | | Parathyroids: one of a pair, tissue missing |
| | | | | Parathyroids: No macropathology findings | Parathyroids: No histopathology findings |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Kidneys; Lacrimal Glands; Larynx; Liver; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Ovaries; Pancreas; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Salivary Gland, Mandibular; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder; Uterus and Cervix; Vagina

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1F | 1505S1 | 92 (14) | Treatment | | Parathyroids: one of a pair, tissue missing |
| | | | | Parathyroids: No macropathology findings | Parathyroids: No histopathology findings |
| | | | | Tracheal Bifurcation: No macropathology findings | Tracheal Bifurcation: Loss of Cilia/Epithelial Thinning, Point of Bifurcation, minimal |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Kidneys; Lacrimal Glands; Larynx; Liver; Lungs and Bronchi; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Ovaries; Pancreas; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Salivary Gland, Mandibular; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Thymus; Thyroids; Trachea; Urinary Bladder; Uterus and Cervix; Vagina

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | | Histopathology findings |
|---|---|---|---|---|---|---|
| 1F | 1506S1 | 92 (14) | Treatment | Kidneys: Dilated Pelvis, bilateral | = | Kidneys: Dilatation, Pelvic, moderate, bilateral |
| | | | | | | Parathyroids: one of a pair, tissue missing |
| | | | | Parathyroids: No macropathology findings | | Parathyroids: No histopathology findings |
| | | | | Tracheal Bifurcation: No macropathology findings | | Tracheal Bifurcation: Loss of Cilia/Epithelial Thinning, Point of Bifurcation, minimal |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Lacrimal Glands; Larynx; Liver; Lungs and Bronchi; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Ovaries; Pancreas; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Salivary Gland, Mandibular; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Thymus; Thyroids; Trachea; Urinary Bladder; Uterus and Cervix; Vagina

= - correlation of macropathology to histopathology finding, S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1F | 1507S1 | 92 (14) | Treatment | Aorta Thoracic: No macropathology findings | Aorta Thoracic: Infiltrate, Inflammatory Cell, minimal, neutrophilic |
| | | | | Lungs and Bronchi: No macropathology findings | Lungs and Bronchi: Infiltrate, Inflammatory Cell, minimal, mononuclear cell (also in plane of section of carina) |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Kidneys; Lacrimal Glands; Larynx; Liver; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Ovaries; Pancreas; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Salivary Gland, Mandibular; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder; Uterus and Cervix; Vagina

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1F | 1508S1 | 92 (14) | Treatment | | Parathyroids: one of a pair, tissue missing |
| | | | | Parathyroids: No macropathology findings | Parathyroids: No histopathology findings |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Kidneys; Lacrimal Glands; Larynx; Liver; Lungs and Bronchi; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Ovaries; Pancreas; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Salivary Gland, Mandibular; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder; Uterus and Cervix; Vagina

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1F | 1509S1 | 92 (14) | Treatment | Kidneys: No macropathology findings | Kidneys: Infiltrate, Inflammatory Cell, minimal, unilateral, mononuclear cell, papilla |
| | | | | Pancreas: No macropathology findings | Pancreas: Infiltrate, Inflammatory Cell, minimal, mononuclear cell |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Lacrimal Glands; Larynx; Liver; Lungs and Bronchi; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Ovaries; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Salivary Gland, Mandibular; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder; Uterus and Cervix; Vagina

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1F | 1510S1 | 92 (14) | Treatment | Lungs and Bronchi: No macropathology findings | Lungs and Bronchi: Alveolar Macrophage Aggregation, minimal |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Kidneys; Lacrimal Glands; Larynx; Liver; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Ovaries; Pancreas; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Salivary Gland, Mandibular; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder; Uterus and Cervix; Vagina

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1F | 1511Z1 | R29 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1F | 1512Z1 | R29 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1F | 1513Z1 | R29 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1F | 1514Z1 | R29 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1F | 1515Z1 | R29 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1F | 1516Z1 | R29 (R5) | Recovery | Kidneys: Dilated Pelvis, left | = Kidneys: Pyelonephritis, slight, unilateral |

Tissues without comments under macropathology findings were within normal limits at necropsy.

= - correlation of macropathology to histopathology finding, Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1F | 1517Z1 | R29 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1F | 1518Z1 | R29 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1F | 1519Z1 | R29 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 1F | 1520Z1 | R29 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 2F | 2501S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 2F | 2502S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 2F | 2503S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 2F | 2504S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 2F | 2505S1 | 92 (14) | Treatment | Kidneys: Dilated Pelvis, bilateral | = Kidneys: Dilatation, Pelvic, minimal, bilateral |

Tissues without comments under macropathology findings were within normal limits at necropsy.

= - correlation of macropathology to histopathology finding, S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 2F | 2506S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 2F | 2507S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 2F | 2508S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 2F | 2509S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 2F | 2510S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 3F | 3501S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 3F | 3502S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 3F | 3503S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 3F | 3504S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 3F | 3505S1 | 92 (14) | Treatment | Lungs and Bronchi: Incomplete deflation, all lobes | Examined, not correlated |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Lungs and Bronchi

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 3F | 3506S1 | 92 (14) | Treatment | Thyroids: Small, right | Examined, not correlated |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Thyroids

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 3F | 3507S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 3F | 3508S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 3F | 3509S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 3F | 3510S1 | 92 (14) | Treatment | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4F | 4501S1 | 92 (14) | Treatment | Kidneys: No macropathology findings | Kidneys: Infiltrate, Inflammatory Cell, minimal, unilateral, mononuclear cell |
| | | | | | Parathyroids: one of a pair, tissue missing |
| | | | | Parathyroids: No macropathology findings | Parathyroids: No histopathology findings |
| | | | | Thyroids: No macropathology findings | Thyroids: Dilatation, Follicular, minimal, unilateral |
| | | | | Tracheal Bifurcation: No macropathology findings | Tracheal Bifurcation: Loss of Cilia/Epithelial Thinning, Point of Bifurcation, minimal |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Lacrimal Glands; Larynx; Liver; Lungs and Bronchi; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Ovaries; Pancreas; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Salivary Gland, Mandibular; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Thymus; Trachea; Urinary Bladder; Uterus and Cervix; Vagina

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | | Histopathology findings |
|---|---|---|---|---|---|---|
| 4F | 4502S1 | 92 (14) | Treatment | Lymph Node, Tracheobronchial: No macropathology findings | | Lymph Node, Tracheobronchial: tissue missing |
| | | | | Mammary: No macropathology findings<br>Skin and Subcutis: Mass(es), perigenital, firm, subcutis, 2-9mm, noted | = | Mammary: B-fibroadenoma, unrelated |
| | | | | Pituitary: No macropathology findings | | Pituitary: insufficient, could not be evaluated |
| | | | | Tracheal Bifurcation: No macropathology findings | | Tracheal Bifurcation: insufficient, could not be evaluated<br>Note: Epithelium at point of bifurcation not present |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Kidneys; Lacrimal Glands; Larynx; Liver; Lungs and Bronchi; Lymph Node, Axillary; Lymph Node, Mesenteric; Nerve, Sciatic; Nose/Turbinates; Ovaries; Pancreas; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Salivary Gland, Mandibular; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Thymus; Thyroids; Trachea; Urinary Bladder; Uterus and Cervix; Vagina

= - correlation of macropathology to histopathology finding, S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4F | 4503S1 | 92 (14) | Treatment | Kidneys: No macropathology findings | Kidneys: Infarction, minimal, unilateral |
| | | | | Lungs and Bronchi: No macropathology findings | Lungs and Bronchi: Alveolar Macrophage Aggregation, minimal |
| | | | | Nerve, Sciatic: No macropathology findings | Nerve, Sciatic: insufficient, could not be evaluated |
| | | | | Pituitary: No macropathology findings | Pituitary: insufficient, could not be evaluated |
| | | | | Tracheal Bifurcation: No macropathology findings | Tracheal Bifurcation: Loss of Cilia/Epithelial Thinning, Point of Bifurcation, minimal |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Lacrimal Glands; Larynx; Liver; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nose/Turbinates; Ovaries; Pancreas; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Salivary Gland, Mandibular; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Thymus; Thyroids; Trachea; Urinary Bladder; Uterus and Cervix; Vagina

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4F | 4504S1 | 92 (14) | Treatment | Kidneys: Adhesion(s), right, (to right adrenal) | Examined, not correlated |
| | | | | Tracheal Bifurcation: No macropathology findings | Tracheal Bifurcation: insufficient, could not be evaluated<br>Note: Epithelium at point of bifurcation not present |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Kidneys; Lacrimal Glands; Larynx; Liver; Lungs and Bronchi; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Ovaries; Pancreas; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Salivary Gland, Mandibular; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Thymus; Thyroids; Trachea; Urinary Bladder; Uterus and Cervix; Vagina

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4F | 4505S1 | 92 (14) | Treatment | Lungs and Bronchi: No macropathology findings | Lungs and Bronchi: Infiltrate, Inflammatory Cell, minimal, mononuclear cell |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Kidneys; Lacrimal Glands; Larynx; Liver; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Ovaries; Pancreas; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Salivary Gland, Mandibular; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder; Uterus and Cervix; Vagina

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4F | 4506S1 | 92 (14) | Treatment | All tissues: No macropathology findings | All examined tissues: No histopathology findings |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Kidneys; Lacrimal Glands; Larynx; Liver; Lungs and Bronchi; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Ovaries; Pancreas; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Salivary Gland, Mandibular; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder; Uterus and Cervix; Vagina

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4F | 4507S1 | 92 (14) | Treatment | Lymph Node, Axillary: No macropathology findings | Lymph Node, Axillary: tissue missing |
| | | | | Parathyroids: No macropathology findings | Parathyroids: both, tissue missing |
| | | | | Tracheal Bifurcation: No macropathology findings | Tracheal Bifurcation: Loss of Cilia/Epithelial Thinning, Point of Bifurcation, minimal |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Kidneys; Lacrimal Glands; Larynx; Liver; Lungs and Bronchi; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Ovaries; Pancreas; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Salivary Gland, Mandibular; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Thymus; Thyroids; Trachea; Urinary Bladder; Uterus and Cervix; Vagina

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4F | 4508S1 | 92 (14) | Treatment | Larynx: No macropathology findings | Larynx: No histopathology findings<br>Note: Epithelium at base of epiglottis not present |
| | | | | Lymph Node, Tracheobronchial: No macropathology findings | Lymph Node, Tracheobronchial: tissue missing |
| | | | | Thyroids: Small, bilateral | Examined, not correlated |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Kidneys; Lacrimal Glands; Liver; Lungs and Bronchi; Lymph Node, Axillary; Lymph Node, Mesenteric; Mammary; Nerve, Sciatic; Nose/Turbinates; Ovaries; Pancreas; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Salivary Gland, Mandibular; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder; Uterus and Cervix; Vagina

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4F | 4509S1 | 92 (14) | Treatment | Kidneys: No macropathology findings | Kidneys: Nephropathy, Chronic Progressive, minimal, bilateral |
| | | | | Lungs and Bronchi: No macropathology findings | Lungs and Bronchi: Alveolar Macrophage Aggregation, minimal |
| | | | | Parathyroids: No macropathology findings | Parathyroids: one of a pair, tissue missing<br>Parathyroids: No histopathology findings |
| | | | | Peyer's Patches/GALT: No macropathology findings | Peyer's Patches/GALT: Mineralization, slight |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Lacrimal Glands; Larynx; Liver; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Ovaries; Pancreas; Pharynx, Nasal; Pituitary; Salivary Gland, Mandibular; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder; Uterus and Cervix; Vagina

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4F | 4510S1 | 92 (14) | Treatment | Lungs and Bronchi: No macropathology findings | Lungs and Bronchi: Alveolar Macrophage Aggregation, minimal |

Tissues without comments under macropathology findings were within normal limits at necropsy. The following examined tissues had no histopathology findings, notes, or comments:
Adrenals; Aorta Thoracic; Bone Marrow, Femoral; Bone Marrow, Sternal; Bone, Femur Including Joint; Bone, Sternum; Brain; Cecum; Colon; Duodenum; Esophagus; Eyes; Harderian Glands; Heart; Ileum; Jejunum; Kidneys; Lacrimal Glands; Larynx; Liver; Lymph Node, Axillary; Lymph Node, Mesenteric; Lymph Node, Tracheobronchial; Mammary; Nerve, Sciatic; Nose/Turbinates; Ovaries; Pancreas; Parathyroids; Peyer's Patches/GALT; Pharynx, Nasal; Pituitary; Salivary Gland, Mandibular; Skeletal muscle, Rectus femoris; Skin and Subcutis; Spinal Cord Cervical; Spinal Cord Lumbar; Spinal Cord Thoracic; Spleen; Stomach; Thymus; Thyroids; Trachea; Tracheal Bifurcation; Urinary Bladder; Uterus and Cervix; Vagina

S1 - Scheduled Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4F | 4511Z1 | R29 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4F | 4512Z1 | R29 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4F | 4513Z1 | R29 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4F | 4514Z1 | R29 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | | Histopathology findings |
|---|---|---|---|---|---|---|
| 4F | 4515Z1 | R29 (R5) | Recovery | Lymph Node, Axillary: Abnormal Color, left, red, noted | = | Lymph Node, Axillary: Erythrocytosis/Erythrophagocytosis, Sinuses, minimal |

Tissues without comments under macropathology findings were within normal limits at necropsy.

= - correlation of macropathology to histopathology finding, Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4F | 4516Z1 | R29 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4F | 4517Z1 | R29 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4F | 4518Z1 | R29 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Dose Group | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4F | 4519Z1 | R29 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

APPENDIX 14 (cont) Macropathology and histopathology - individual findings

| Dose Group | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Dose ($mg/m^3$) | | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Macropathology findings | Histopathology findings |
|---|---|---|---|---|---|
| 4F | 4520Z1 | R29 (R5) | Recovery | All tissues: No macropathology findings | No histopathology examination |

Tissues without comments under macropathology findings were within normal limits at necropsy.

Z1 - Recovery Euthanasia 1

# Annex 1 Gasoline analysis

108_141022_002 VC-Run 1970 distillate batch 1.txt
CHEVRON RESEARCH GASOLINE ANALYSIS
ASTM DHAX METHOD

Sample ID: VC-Run 1970 distillate batch 1
Acquisition Date & Time: 10/22/2014 9:32:40 AM
Channel: C108 (Offline)
Analysis: 108_141022_002.dat

*** DETAILED COMPOSITION, PERCENT ***

| C NO. | PARA | OLEF | NAPH | AROM | UNCL HC | TOTALS BY C # | NORMAL PARA | NON-ALKYL I-PARA | ALKYL I-PARA | CYCLO-PENT | CYCLO-HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| => BY WEIGHT | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 7.14 | **** | **** | **** | 2.82 | 9.97 | 0.30 | 6.84 | **** | **** | **** |
| 5 | 66.96 | **** | 4.97 | **** | **** | 71.93 | 0.20 | 66.76 | **** | 4.97 | **** |
| 6 | 3.68 | **** | 0.22 | **** | **** | 3.90 | 0.60 | 3.07 | **** | 0.18 | 0.04 |
| 7 | 0.98 | **** | 0.01 | **** | **** | 1.00 | **** | 0.98 | **** | **** | 0.01 |
| 8 | 12.91 | **** | 0.13 | **** | **** | 13.03 | 0.03 | 0.50 | 12.37 | **** | 0.13 |
| 9 | 0.02 | **** | 0.07 | 0.09 | **** | 0.18 | 0.01 | 0.01 | **** | 0.02 | 0.05 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 91.69 | **** | 5.40 | 0.09 | 2.82 | 100.00 | 1.15 | 78.17 | 12.37 | 5.18 | 0.22 |
| => BY VOLUME | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 8.12 | **** | **** | **** | 2.29 | 10.41 | 0.33 | 7.79 | **** | **** | **** |
| 5 | 68.72 | **** | 4.25 | **** | **** | 72.97 | 0.20 | 68.52 | **** | 4.25 | **** |
| 6 | 3.58 | **** | 0.19 | **** | **** | 3.77 | 0.58 | 3.00 | **** | 0.16 | 0.03 |
| 7 | 0.91 | **** | 0.01 | **** | **** | 0.92 | **** | 0.91 | **** | **** | 0.01 |
| 8 | 11.69 | **** | 0.10 | **** | **** | 11.79 | 0.03 | 0.46 | 11.20 | **** | 0.10 |
| 9 | 0.02 | **** | 0.06 | 0.07 | **** | 0.14 | 0.01 | 0.01 | **** | 0.02 | 0.04 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 93.04 | **** | 4.60 | 0.07 | 2.29 | 100.00 | 1.15 | 80.69 | 11.20 | 4.42 | 0.18 |
| => BY MOLAR | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 9.16 | **** | **** | **** | 3.62 | 12.78 | 0.38 | 8.78 | **** | **** | **** |
| 5 | 69.19 | **** | 5.28 | **** | **** | 74.48 | 0.21 | 68.99 | **** | 5.28 | **** |
| 6 | 3.18 | **** | 0.20 | **** | **** | 3.38 | 0.52 | 2.66 | **** | 0.16 | 0.03 |
| 7 | 0.73 | **** | 0.01 | **** | **** | 0.74 | **** | 0.73 | **** | **** | 0.01 |
| 8 | 8.42 | **** | 0.08 | **** | **** | 8.51 | 0.02 | 0.33 | 8.08 | **** | 0.08 |
| 9 | 0.01 | **** | 0.04 | 0.06 | **** | 0.11 | 0.01 | 0.01 | **** | 0.01 | 0.03 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 90.71 | **** | 5.61 | 0.06 | 3.62 | 100.00 | 1.14 | 81.49 | 8.08 | 5.46 | 0.15 |

GRP. TYPE, VOL %: P = 95.22, O = 0.00, N = 4.71, A = 0.07, Saturates = 99.93
DIENE CONTENT = 0 vol ppm AVG MW= 74.6 API GR.= 89.2 SP. GR.= 0.6411
OCTANE NUMBER: (from pure values) RON = 94.0 MON = 90.9
(from blending values) RON = 92.5 MON = 88.4
CARBON-HYDROGEN RATIO = 5.041 STOICH. AIR-FUEL RATIO = 15.25 lbs air/lbs fuel
BTU/lb = 19253 NET, 20735 GROSS; BTU/gal = 103002 NET, 110929 GROSS
REID VAPOR PRESSURE = 21.7 BROMINE NO. = 0.0

* DISTILLATION CURVES

108_141022_002 VC-Run 1970 distillate batch 1.txt

| VOL % | TBP | D86 |
|---|---|---|
| 0 | 11 | 83 |
| 5 | 11 | 83 |
| 10 | 82 | 83 |
| 15 | 82 | 83 |
| 20 | 82 | 83 |
| 25 | 82 | 83 |
| 30 | 82 | 83 |
| 35 | 82 | 83 |
| 40 | 82 | 83 |
| 45 | 82 | 83 |
| 50 | 82 | 83 |
| 55 | 82 | 83 |
| 60 | 82 | 83 |
| 65 | 82 | 83 |
| 70 | 82 | 83 |
| 75 | 82 | 83 |
| 80 | 121 | 121 |
| 85 | 181 | 181 |
| 90 | 211 | 210 |
| 95 | 211 | 238 |
| 100 | 337 | 238 |

* COMPOUND DICTIONARY NUMBERS AND AREAS AS READ IN

| CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 157883 | 4 | 6872 | 8 | 4974 | 7 | 1546917 | 6 | 4632 |
| 12 | 52022 | 800 | 118832 | 13 | 1771 | 10 | 9361 | 11 | 8555 |
| 9 | 14122 | 801 | 4383 | 18 | 854 | 20 | 1176 | 1009 | 59009 |
| 825 | 896 | 19 | 13594 | 15 | 4269 | 16 | 3166 | 37 | 184060 |
| 826 | 262 | 36 | 2298 | 31 | 6287 | 30 | 4663 | 39 | 3308 |
| 38 | 100926 | 34 | 430 | 24 | 400 | 831 | 1218 | 848 | 546 |
| 830 | 595 | 832 | 427 | 23 | 685 | 827 | 817 | 946 | 297 |
| 956 | 496 | 61 | 213 | 941 | 290 | 41 | 342 | 609 | 697 |
| 610 | 417 | 613 | 329 | 612 | 866 | | | | |

TOTAL UNCORRECTED AREA = 2324157
NUMBER OF PEAKS READ IN = 43

* DETAILED HYDROCARBON ANALYSIS, EXCLUDING COMPOUNDS BELOW 0.01 VOLUME PERCENT

NORMAL PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4 | 0.38 | 0.33 | 0.30 | N-BUTANE |
| 6 | 0.21 | 0.20 | 0.20 | N-PENTANE |
| 9 | 0.52 | 0.58 | 0.60 | N-HEXANE |
| 23 | 0.02 | 0.03 | 0.03 | N-OCTANE |
| 41 | 0.01 | 0.01 | 0.01 | N-NONANE |

ISO-PARAFFINS

108_141022_002 VC-Run 1970 distillate batch 1.txt

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 5 | 8.78 | 7.79 | 6.84 | ISOBUTANE | |
| 8 | 0.22 | 0.23 | 0.21 | 22-DIME PROPANE | |
| 7 | 68.77 | 68.29 | 66.54 | ISOPENTANE | |
| 12 | 1.93 | 2.18 | 2.23 | 22-DIME BUTANE | |
| 13 | 0.07 | 0.07 | 0.08 | 23-DIME BUTANE | |
| 10 | 0.35 | 0.39 | 0.40 | 2-ME PENTANE | |
| 11 | 0.32 | 0.35 | 0.37 | 3-ME PENTANE | |
| 18 | 0.03 | 0.03 | 0.04 | 22-DIME PENTANE | |
| 20 | 0.04 | 0.05 | 0.05 | 24-DIME PENTANE | |
| 19 | 0.43 | 0.53 | 0.58 | 23-DIME PENTANE | |
| 15 | 0.14 | 0.17 | 0.18 | 2-ME HEXANE | |
| 16 | 0.10 | 0.13 | 0.14 | 3-ME HEXANE | |
| 37 | 5.12 | 7.22 | 7.84 | 224-TRIME PENTANE | * |
| 36 | 0.06 | 0.09 | 0.10 | 223-TRIME PENTANE | * |
| 31 | 0.17 | 0.25 | 0.27 | 25-DIME HEXANE | |
| 30 | 0.13 | 0.18 | 0.20 | 24-DIME HEXANE | |
| 39 | 0.09 | 0.12 | 0.14 | 234-TRIME PENTANE | * |
| 38 | 2.81 | 3.77 | 4.30 | 233-TRIME PENTANE | * |
| 34 | 0.01 | 0.02 | 0.02 | 2-ME-3-ET PENTANE | |
| 24 | 0.01 | 0.02 | 0.02 | 2-ME HEPTANE | |

CYCLOPENTANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 800 | 5.28 | 4.25 | 4.97 | CYCLOPENTANE |
| 801 | 0.16 | 0.16 | 0.18 | ME CYCLOPENTANE |
| 848 | 0.01 | 0.02 | 0.02 | 113T4-TETRME CPENT |

CYCLOHEXANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 825 | 0.03 | 0.03 | 0.04 | CYCLOHEXANE |
| 831 | 0.03 | 0.04 | 0.05 | 1C3-DIME CYCHEXANE |
| 830 | 0.02 | 0.02 | 0.02 | 1T2-DIME CYCHEXANE |
| 832 | 0.01 | 0.01 | 0.02 | 1T3-DIME CYCHEXANE |
| 827 | 0.02 | 0.03 | 0.03 | ETHYL CYCLOHEXANE |
| 946 | 0.01 | 0.01 | 0.01 | 113-TRIME CYCHEXANE |
| 956 | 0.01 | 0.02 | 0.02 | 1C3T5-TRIME CYCHEX |

AROMATIC HCS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 609 | 0.02 | 0.02 | 0.03 | 1-ME-3-ET BENZENE | |
| 610 | 0.01 | 0.01 | 0.02 | 1-ME-4-ET BENZENE | |
| 612 | 0.02 | 0.03 | 0.03 | 124-TRIME BENZENE | * |

UNCLASSIFIED HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 1009 | 3.62 | 2.29 | 2.82 | ISOBUTANOL |

108_141022_006 VC-Run 1972 distillate batch 2.txt
CHEVRON RESEARCH GASOLINE ANALYSIS
ASTM DHAX METHOD

Sample ID: VC-Run 1972 distillate batch 2
Acquisition Date & Time: 10/23/2014 10:58:20 AM
Channel: C108 (Offline)
Analysis: 108_141022_006.dat

*** DETAILED COMPOSITION, PERCENT ***

| C NO. | PARA | OLEF | NAPH | AROM | UNCL HC | TOTALS BY C # | NORMAL PARA | NON-ALKYL I-PARA | ALKYL I-PARA | CYCLO-PENT | CYCLO-HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| => BY WEIGHT | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 6.41 | **** | **** | **** | 3.03 | 9.44 | 0.27 | 6.14 | **** | **** | **** |
| 5 | 66.46 | **** | 5.21 | **** | **** | 71.67 | 0.20 | 66.26 | **** | 5.21 | **** |
| 6 | 3.89 | **** | 0.24 | **** | **** | 4.13 | 0.64 | 3.25 | **** | 0.20 | 0.04 |
| 7 | 1.04 | **** | 0.02 | **** | **** | 1.06 | 0.01 | 1.03 | **** | **** | 0.02 |
| 8 | 13.35 | **** | 0.13 | **** | **** | 13.48 | 0.03 | 0.52 | 12.81 | **** | 0.13 |
| 9 | 0.03 | **** | 0.07 | 0.11 | **** | 0.21 | 0.02 | 0.01 | **** | 0.02 | 0.05 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 91.18 | **** | 5.67 | 0.11 | 3.03 | 100.00 | 1.16 | 77.22 | 12.81 | 5.43 | 0.24 |
| => BY VOLUME | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 7.31 | **** | **** | **** | 2.46 | 9.77 | 0.30 | 7.00 | **** | **** | **** |
| 5 | 68.38 | **** | 4.46 | **** | **** | 72.84 | 0.20 | 68.18 | **** | 4.46 | **** |
| 6 | 3.81 | **** | 0.20 | **** | **** | 4.01 | 0.62 | 3.19 | **** | 0.17 | 0.03 |
| 7 | 0.97 | **** | 0.02 | **** | **** | 0.98 | 0.01 | 0.96 | **** | **** | 0.02 |
| 8 | 12.12 | **** | 0.11 | **** | **** | 12.23 | 0.02 | 0.47 | 11.62 | **** | 0.11 |
| 9 | 0.02 | **** | 0.06 | 0.08 | **** | 0.17 | 0.01 | 0.01 | **** | 0.02 | 0.04 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 92.61 | **** | 4.85 | 0.08 | 2.46 | 100.00 | 1.17 | 79.82 | 11.62 | 4.65 | 0.20 |
| => BY MOLAR | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 8.25 | **** | **** | **** | 3.90 | 12.16 | 0.35 | 7.90 | **** | **** | **** |
| 5 | 68.93 | **** | 5.56 | **** | **** | 74.49 | 0.20 | 68.73 | **** | 5.56 | **** |
| 6 | 3.38 | **** | 0.21 | **** | **** | 3.59 | 0.56 | 2.83 | **** | 0.18 | 0.04 |
| 7 | 0.78 | **** | 0.02 | **** | **** | 0.80 | 0.01 | 0.77 | **** | **** | 0.02 |
| 8 | 8.75 | **** | 0.09 | **** | **** | 8.84 | 0.02 | 0.34 | 8.39 | **** | 0.09 |
| 9 | 0.02 | **** | 0.04 | 0.07 | **** | 0.13 | 0.01 | 0.01 | **** | 0.01 | 0.03 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 90.11 | **** | 5.92 | 0.07 | 3.90 | 100.00 | 1.15 | 80.58 | 8.39 | 5.75 | 0.17 |

GRP. TYPE, VOL %: P = 94.94, O = 0.00, N = 4.97, A = 0.09, Saturates = 99.91
DIENE CONTENT = 0 vol ppm AVG MW= 74.8 API GR.= 88.7 SP. GR.= 0.6427
OCTANE NUMBER: (from pure values) RON = 93.9 MON = 90.8
(from blending values) RON = 92.4 MON = 88.3
CARBON-HYDROGEN RATIO = 5.047 STOICH. AIR-FUEL RATIO = 15.25 lbs air/lbs fuel
BTU/lb = 19244 NET, 20721 GROSS; BTU/gal = 103214 NET, 111134 GROSS
REID VAPOR PRESSURE = 21.1 BROMINE NO. = 0.0

* DISTILLATION CURVES

108_141022_006 VC-Run 1972 distillate batch 2.txt

| VOL % | TBP | D86 |
|---|---|---|
| 0 | 11 | 83 |
| 5 | 11 | 83 |
| 10 | 82 | 83 |
| 15 | 82 | 83 |
| 20 | 82 | 83 |
| 25 | 82 | 83 |
| 30 | 82 | 83 |
| 35 | 82 | 83 |
| 40 | 82 | 83 |
| 45 | 82 | 83 |
| 50 | 82 | 83 |
| 55 | 82 | 83 |
| 60 | 82 | 83 |
| 65 | 82 | 83 |
| 70 | 82 | 83 |
| 75 | 82 | 121 |
| 80 | 121 | 122 |
| 85 | 181 | 181 |
| 90 | 211 | 210 |
| 95 | 211 | 238 |
| 100 | 337 | 238 |

* COMPOUND DICTIONARY NUMBERS AND AREAS AS READ IN

| CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 130396 | 4 | 5810 | 8 | 4200 | 7 | 1414759 | 6 | 4207 |
| 12 | 50546 | 800 | 114700 | 13 | 1805 | 10 | 9195 | 11 | 8453 |
| 9 | 13760 | 801 | 4346 | 18 | 936 | 20 | 1124 | 1009 | 58347 |
| 825 | 918 | 19 | 12986 | 15 | 4080 | 16 | 3176 | 37 | 175723 |
| 14 | 202 | 826 | 474 | 36 | 2155 | 31 | 5955 | 30 | 4460 |
| 39 | 3035 | 38 | 96086 | 34 | 438 | 24 | 358 | 831 | 1086 |
| 848 | 512 | 830 | 519 | 832 | 417 | 23 | 584 | 827 | 912 |
| 946 | 290 | 956 | 488 | 61 | 209 | 941 | 268 | 41 | 360 |
| 609 | 765 | 610 | 389 | 613 | 372 | 608 | 177 | 612 | 913 |

TOTAL UNCORRECTED AREA = 2140891
NUMBER OF PEAKS READ IN = 45

* DETAILED HYDROCARBON ANALYSIS, EXCLUDING COMPOUNDS BELOW 0.01 VOLUME PERCENT

NORMAL PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4 | 0.35 | 0.30 | 0.27 | N-BUTANE |
| 6 | 0.20 | 0.20 | 0.20 | N-PENTANE |
| 9 | 0.56 | 0.62 | 0.64 | N-HEXANE |
| 23 | 0.02 | 0.02 | 0.03 | N-OCTANE |
| 41 | 0.01 | 0.01 | 0.02 | N-NONANE |

108_141022_006 VC-Run 1972 distillate batch 2.txt

ISO-PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 5 | 7.90 | 7.00 | 6.14 | ISOBUTANE | |
| 8 | 0.20 | 0.21 | 0.20 | 22-DIME PROPANE | |
| 7 | 68.53 | 67.97 | 66.07 | ISOPENTANE | |
| 12 | 2.04 | 2.31 | 2.35 | 22-DIME BUTANE | |
| 13 | 0.07 | 0.08 | 0.08 | 23-DIME BUTANE | |
| 10 | 0.37 | 0.42 | 0.43 | 2-ME PENTANE | |
| 11 | 0.34 | 0.38 | 0.39 | 3-ME PENTANE | |
| 18 | 0.03 | 0.04 | 0.04 | 22-DIME PENTANE | |
| 20 | 0.04 | 0.05 | 0.05 | 24-DIME PENTANE | |
| 19 | 0.45 | 0.55 | 0.60 | 23-DIME PENTANE | |
| 15 | 0.14 | 0.18 | 0.19 | 2-ME HEXANE | |
| 16 | 0.11 | 0.14 | 0.15 | 3-ME HEXANE | |
| 37 | 5.32 | 7.50 | 8.12 | 224-TRIME PENTANE | * |
| 36 | 0.07 | 0.09 | 0.10 | 223-TRIME PENTANE | * |
| 31 | 0.18 | 0.25 | 0.28 | 25-DIME HEXANE | |
| 30 | 0.14 | 0.19 | 0.21 | 24-DIME HEXANE | |
| 39 | 0.09 | 0.12 | 0.14 | 234-TRIME PENTANE | * |
| 38 | 2.91 | 3.91 | 4.44 | 233-TRIME PENTANE | * |
| 34 | 0.01 | 0.02 | 0.02 | 2-ME-3-ET PENTANE | |
| 24 | 0.01 | 0.02 | 0.02 | 2-ME HEPTANE | |

CYCLOPENTANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 800 | 5.56 | 4.46 | 5.21 | CYCLOPENTANE |
| 801 | 0.18 | 0.17 | 0.20 | ME CYCLOPENTANE |
| 848 | 0.01 | 0.02 | 0.02 | 113T4-TETRME CPENT |

CYCLOHEXANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 825 | 0.04 | 0.03 | 0.04 | CYCLOHEXANE |
| 826 | 0.02 | 0.02 | 0.02 | ME CYCLOHEXANE |
| 831 | 0.03 | 0.04 | 0.05 | 1C3-DIME CYCHEXANE |
| 830 | 0.02 | 0.02 | 0.02 | 1T2-DIME CYCHEXANE |
| 832 | 0.01 | 0.02 | 0.02 | 1T3-DIME CYCHEXANE |
| 827 | 0.03 | 0.03 | 0.04 | ETHYL CYCLOHEXANE |
| 946 | 0.01 | 0.01 | 0.01 | 113-TRIME CYCHEXANE |
| 956 | 0.01 | 0.02 | 0.02 | 1C3T5-TRIME CYCHEX |

AROMATIC HCS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 609 | 0.02 | 0.02 | 0.03 | 1-ME-3-ET BENZENE | |
| 610 | 0.01 | 0.01 | 0.02 | 1-ME-4-ET BENZENE | |
| 613 | 0.01 | 0.01 | 0.02 | 135-TRIME BENZENE | |
| 612 | 0.02 | 0.03 | 0.04 | 124-TRIME BENZENE | * |

UNCLASSIFIED HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 1009 | 3.90 | 2.46 | 3.03 | ISOBUTANOL |

108_141022_007 VC-Run 1973 distillate batch 3.txt
CHEVRON RESEARCH GASOLINE ANALYSIS
ASTM DHAX METHOD

Sample ID: VC-Run 1973 distillate batch 3
Acquisition Date & Time: 10/23/2014 2:43:21 PM
Channel: C108 (Offline)
Analysis: 108_141022_007.dat

*** DETAILED COMPOSITION, PERCENT ***

| C NO. | PARA | OLEF | NAPH | AROM | UNCL HC | TOTALS BY C # | NORMAL PARA | NON-ALKYL I-PARA | ALKYL I-PARA | CYCLO-PENT | CYCLO-HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| => BY WEIGHT | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 6.44 | **** | **** | **** | 2.49 | 8.93 | 0.27 | 6.17 | **** | **** | **** |
| 5 | 65.71 | **** | 5.18 | **** | **** | 70.89 | 0.20 | 65.51 | **** | 5.18 | **** |
| 6 | 3.92 | **** | 0.25 | **** | **** | 4.17 | 0.65 | 3.28 | **** | 0.20 | 0.05 |
| 7 | 1.07 | **** | **** | **** | **** | 1.07 | **** | 1.07 | **** | **** | **** |
| 8 | 14.50 | 0.05 | 0.11 | **** | **** | 14.66 | 0.03 | 0.59 | 13.89 | **** | 0.11 |
| 9 | 0.02 | **** | 0.04 | 0.12 | 0.04 | 0.23 | 0.02 | **** | **** | **** | 0.04 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.05 | 0.05 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | 0.02 | 0.02 | **** | **** | **** | **** | **** |
| TOT | 91.66 | 0.05 | 5.57 | 0.12 | 2.60 | 100.00 | 1.16 | 76.61 | 13.89 | 5.38 | 0.19 |
| => BY VOLUME | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 7.34 | **** | **** | **** | 2.02 | 9.36 | 0.29 | 7.05 | **** | **** | **** |
| 5 | 67.64 | **** | 4.44 | **** | **** | 72.08 | 0.20 | 67.44 | **** | 4.44 | **** |
| 6 | 3.84 | **** | 0.21 | **** | **** | 4.05 | 0.63 | 3.21 | **** | 0.17 | 0.04 |
| 7 | 0.99 | **** | **** | **** | **** | 0.99 | **** | 0.99 | **** | **** | **** |
| 8 | 13.17 | 0.04 | 0.09 | **** | **** | 13.29 | 0.03 | 0.54 | 12.60 | **** | 0.09 |
| 9 | 0.02 | **** | 0.03 | 0.09 | 0.04 | 0.18 | 0.02 | **** | **** | **** | 0.03 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.04 | 0.04 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** | **** |
| TOT | 92.98 | 0.04 | 4.77 | 0.09 | 2.11 | 100.00 | 1.16 | 79.22 | 12.60 | 4.61 | 0.16 |
| => BY MOLAR | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 8.34 | **** | **** | **** | 3.22 | 11.56 | 0.34 | 8.00 | **** | **** | **** |
| 5 | 68.58 | **** | 5.56 | **** | **** | 74.15 | 0.21 | 68.38 | **** | 5.56 | **** |
| 6 | 3.43 | **** | 0.22 | **** | **** | 3.65 | 0.56 | 2.86 | **** | 0.18 | 0.04 |
| 7 | 0.80 | **** | **** | **** | **** | 0.80 | **** | 0.80 | **** | **** | **** |
| 8 | 9.56 | 0.03 | 0.07 | **** | **** | 9.66 | 0.02 | 0.39 | 9.16 | **** | 0.07 |
| 9 | 0.01 | **** | 0.02 | 0.08 | 0.02 | 0.14 | 0.01 | **** | **** | **** | 0.02 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.02 | 0.02 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** | **** |
| TOT | 90.73 | 0.03 | 5.88 | 0.08 | 3.28 | 100.00 | 1.14 | 80.43 | 9.16 | 5.74 | 0.14 |

GRP. TYPE, VOL %: P = 94.99, O = 0.04, N = 4.87, A = 0.09, Saturates = 99.86
DIENE CONTENT = 0 vol ppm AVG MW= 75.3 API GR.= 88.6 SP. GR.= 0.6430
OCTANE NUMBER: (from pure values) RON = 93.8 MON = 90.8
(from blending values) RON = 92.3 MON = 88.2
CARBON-HYDROGEN RATIO = 5.053 STOICH. AIR-FUEL RATIO = 15.25 lbs air/lbs fuel
BTU/lb = 19241 NET, 20711 GROSS; BTU/gal = 103244 NET, 111130 GROSS
REID VAPOR PRESSURE = 21.0 BROMINE NO. = 0.1

* DISTILLATION CURVES

108_141022_007 VC-Run 1973 distillate batch 3.txt

| VOL % | TBP | D86 |
|---|---|---|
| 0 | 11 | 83 |
| 5 | 11 | 83 |
| 10 | 82 | 83 |
| 15 | 82 | 83 |
| 20 | 82 | 83 |
| 25 | 82 | 83 |
| 30 | 82 | 83 |
| 35 | 82 | 83 |
| 40 | 82 | 83 |
| 45 | 82 | 83 |
| 50 | 82 | 83 |
| 55 | 82 | 83 |
| 60 | 82 | 83 |
| 65 | 82 | 83 |
| 70 | 82 | 83 |
| 75 | 121 | 121 |
| 80 | 122 | 122 |
| 85 | 181 | 194 |
| 90 | 211 | 210 |
| 95 | 230 | 238 |
| 100 | 390 | 238 |

* COMPOUND DICTIONARY NUMBERS AND AREAS AS READ IN

| CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 97641 | 4 | 4205 | 8 | 2995 | 7 | 1041310 | 6 | 3133 |
| 12 | 37798 | 800 | 84961 | 13 | 1366 | 10 | 7021 | 11 | 6291 |
| 9 | 10339 | 801 | 3312 | 18 | 669 | 20 | 881 | 1009 | 35632 |
| 825 | 781 | 19 | 10030 | 15 | 3182 | 16 | 2349 | 37 | 138725 |
| 36 | 1727 | 31 | 4825 | 30 | 3565 | 39 | 3541 | 38 | 79637 |
| 4527 | 786 | 34 | 252 | 26 | 815 | 831 | 346 | 830 | 406 |
| 832 | 400 | 23 | 461 | 827 | 572 | 946 | 250 | 189 | 685 |
| 956 | 386 | 41 | 333 | 609 | 626 | 610 | 364 | 613 | 359 |
| 612 | 794 | 191 | 828 | 4104 | 273 | | | | |

TOTAL UNCORRECTED AREA = 1594852
NUMBER OF PEAKS READ IN = 43

* DETAILED HYDROCARBON ANALYSIS, EXCLUDING COMPOUNDS BELOW 0.01 VOLUME PERCENT

NORMAL PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4 | 0.34 | 0.29 | 0.27 | N-BUTANE |
| 6 | 0.21 | 0.20 | 0.20 | N-PENTANE |
| 9 | 0.56 | 0.63 | 0.65 | N-HEXANE |
| 23 | 0.02 | 0.03 | 0.03 | N-OCTANE |
| 41 | 0.01 | 0.02 | 0.02 | N-NONANE |

ISO-PARAFFINS

108_141022_007 VC-Run 1973 distillate batch 3.txt

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 5 | 8.00 | 7.05 | 6.17 | ISOBUTANE | |
| 8 | 0.20 | 0.20 | 0.19 | 22-DIME PROPANE | |
| 7 | 68.18 | 67.23 | 65.32 | ISOPENTANE | |
| 12 | 2.06 | 2.32 | 2.36 | 22-DIME BUTANE | |
| 13 | 0.07 | 0.08 | 0.09 | 23-DIME BUTANE | |
| 10 | 0.38 | 0.43 | 0.44 | 2-ME PENTANE | |
| 11 | 0.34 | 0.38 | 0.39 | 3-ME PENTANE | |
| 18 | 0.03 | 0.04 | 0.04 | 22-DIME PENTANE | |
| 20 | 0.04 | 0.05 | 0.05 | 24-DIME PENTANE | |
| 19 | 0.47 | 0.57 | 0.62 | 23-DIME PENTANE | |
| 15 | 0.15 | 0.19 | 0.20 | 2-ME HEXANE | |
| 16 | 0.11 | 0.14 | 0.15 | 3-ME HEXANE | |
| 37 | 5.68 | 7.96 | 8.62 | 224-TRIME PENTANE | * |
| 36 | 0.07 | 0.10 | 0.11 | 223-TRIME PENTANE | * |
| 31 | 0.20 | 0.28 | 0.30 | 25-DIME HEXANE | |
| 30 | 0.15 | 0.20 | 0.22 | 24-DIME HEXANE | |
| 39 | 0.14 | 0.20 | 0.22 | 234-TRIME PENTANE | * |
| 38 | 3.26 | 4.35 | 4.95 | 233-TRIME PENTANE | * |
| 34 | 0.01 | 0.01 | 0.02 | 2-ME-3-ET PENTANE | |
| 26 | 0.03 | 0.05 | 0.05 | 4-ME HEPTANE | |

CYCLOPENTANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 800 | 5.56 | 4.44 | 5.18 | CYCLOPENTANE |
| 801 | 0.18 | 0.17 | 0.20 | ME CYCLOPENTANE |

CYCLOHEXANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 825 | 0.04 | 0.04 | 0.05 | CYCLOHEXANE |
| 831 | 0.01 | 0.02 | 0.02 | 1C3-DIME CYCHEXANE |
| 830 | 0.02 | 0.02 | 0.02 | 1T2-DIME CYCHEXANE |
| 832 | 0.02 | 0.02 | 0.02 | 1T3-DIME CYCHEXANE |
| 827 | 0.02 | 0.03 | 0.03 | ETHYL CYCLOHEXANE |
| 946 | 0.01 | 0.01 | 0.02 | 113-TRIME CYCHEXANE |
| 956 | 0.01 | 0.02 | 0.02 | 1C3T5-TRIME CYCHEX |

OLEFINS, DIENES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4527 | 0.03 | 0.04 | 0.05 | OCTENE C |

AROMATIC HCS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 609 | 0.02 | 0.03 | 0.04 | 1-ME-3-ET BENZENE | |
| 610 | 0.01 | 0.02 | 0.02 | 1-ME-4-ET BENZENE | |
| 613 | 0.01 | 0.02 | 0.02 | 135-TRIME BENZENE | |
| 612 | 0.03 | 0.03 | 0.05 | 124-TRIME BENZENE | * |

UNCLASSIFIED HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 1009 | 3.22 | 2.02 | 2.49 | ISOBUTANOL |
| 189 | 0.02 | 0.04 | 0.04 | UNCLASS. H.C. C- 9 |

108_141022_007 VC-Run 1973 distillate batch 3.txt

| | | | | |
|---|---|---|---|---|
| 191 | 0.02 | 0.04 | 0.05 | UNCLASS. H.C. C-11 |
| 4104 | 0.01 | 0.01 | 0.02 | UNCLASSIFIED C-12 E |

108_141103_001 Run 1975 VC #5.txt
CHEVRON RESEARCH GASOLINE ANALYSIS
ASTM DHAX METHOD

Sample ID: Run 1975 VC #5
Acquisition Date & Time: 11/3/2014 10:25:01 AM
Channel: C108 (Offline)
Analysis: 108_141103_001.dat

*** DETAILED COMPOSITION, PERCENT ***

| C NO. | PARA | OLEF | NAPH | AROM | UNCL HC | TOTALS BY C # | NORMAL PARA | NON-ALKYL I-PARA | ALKYL I-PARA | CYCLO-PENT | CYCLO-HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| => BY WEIGHT | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 9.72 | **** | **** | **** | 2.72 | 12.44 | 0.34 | 9.37 | **** | **** | **** |
| 5 | 65.51 | **** | 4.65 | **** | **** | 70.16 | 0.19 | 65.32 | **** | 4.65 | **** |
| 6 | 3.46 | **** | 0.21 | **** | **** | 3.66 | 0.56 | 2.90 | **** | 0.17 | 0.04 |
| 7 | 0.91 | **** | 0.01 | **** | **** | 0.92 | **** | 0.91 | **** | **** | 0.01 |
| 8 | 12.38 | **** | 0.08 | **** | 0.02 | 12.47 | **** | 0.49 | 11.89 | 0.01 | 0.07 |
| 9 | 0.09 | **** | 0.05 | 0.14 | 0.05 | 0.33 | 0.02 | 0.07 | **** | 0.02 | 0.03 |
| 10 | 0.01 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 92.06 | **** | 5.00 | 0.14 | 2.80 | 100.00 | 1.11 | 79.07 | 11.89 | 4.84 | 0.15 |
| => BY VOLUME | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 11.00 | **** | **** | **** | 2.20 | 13.20 | 0.37 | 10.63 | **** | **** | **** |
| 5 | 66.95 | **** | 3.96 | **** | **** | 70.90 | 0.19 | 66.76 | **** | 3.96 | **** |
| 6 | 3.36 | **** | 0.17 | **** | **** | 3.53 | 0.54 | 2.82 | **** | 0.14 | 0.03 |
| 7 | 0.84 | **** | 0.01 | **** | **** | 0.85 | **** | 0.84 | **** | **** | 0.01 |
| 8 | 11.16 | **** | 0.07 | **** | 0.02 | 11.24 | **** | 0.45 | 10.71 | 0.00 | 0.06 |
| 9 | 0.08 | **** | 0.04 | 0.10 | 0.04 | 0.27 | 0.02 | 0.07 | **** | 0.02 | 0.03 |
| 10 | 0.01 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.00 | 0.00 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 93.39 | **** | 4.25 | 0.10 | 2.26 | 100.00 | 1.12 | 81.56 | 10.71 | 4.12 | 0.13 |
| => BY MOLAR | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 12.36 | **** | **** | **** | 3.47 | 15.83 | 0.43 | 11.93 | **** | **** | **** |
| 5 | 67.15 | **** | 4.90 | **** | **** | 72.06 | 0.19 | 66.96 | **** | 4.90 | **** |
| 6 | 2.97 | **** | 0.18 | **** | **** | 3.15 | 0.48 | 2.49 | **** | 0.15 | 0.03 |
| 7 | 0.67 | **** | 0.01 | **** | **** | 0.68 | **** | 0.67 | **** | **** | 0.01 |
| 8 | 8.01 | **** | 0.05 | **** | 0.01 | 8.08 | **** | 0.32 | 7.70 | 0.00 | 0.05 |
| 9 | 0.05 | **** | 0.03 | 0.09 | 0.03 | 0.20 | 0.01 | 0.04 | **** | 0.01 | 0.02 |
| 10 | 0.00 | **** | **** | **** | **** | 0.00 | 0.00 | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.00 | 0.00 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 91.23 | **** | 5.18 | 0.09 | 3.51 | 100.00 | 1.12 | 82.41 | 7.70 | 5.07 | 0.11 |

GRP. TYPE, VOL %: P = 95.55, O = 0.00, N = 4.34, A = 0.10, Saturates = 99.90
DIENE CONTENT = 0 vol ppm AVG MW= 74.0 API GR.= 90.2 SP. GR.= 0.6384
OCTANE NUMBER: (from pure values) RON = 94.1 MON = 91.0
(from blending values) RON = 92.8 MON = 88.6
CARBON-HYDROGEN RATIO = 5.032 STOICH. AIR-FUEL RATIO = 15.26 lbs air/lbs fuel
BTU/lb = 19252 NET, 20739 GROSS; BTU/gal = 102559 NET, 110481 GROSS
REID VAPOR PRESSURE = 23.5 BROMINE NO. = 0.0

* DISTILLATION CURVES

108_141103_001 Run 1975 VC #5.txt

| VOL % | TBP | D86 |
|---|---|---|
| 0 | 11 | 83 |
| 5 | 11 | 83 |
| 10 | 11 | 83 |
| 15 | 82 | 83 |
| 20 | 82 | 83 |
| 25 | 82 | 83 |
| 30 | 82 | 83 |
| 35 | 82 | 83 |
| 40 | 82 | 83 |
| 45 | 82 | 83 |
| 50 | 82 | 83 |
| 55 | 82 | 83 |
| 60 | 82 | 83 |
| 65 | 82 | 83 |
| 70 | 82 | 83 |
| 75 | 82 | 83 |
| 80 | 121 | 121 |
| 85 | 156 | 181 |
| 90 | 211 | 210 |
| 95 | 211 | 238 |
| 100 | 365 | 238 |

* COMPOUND DICTIONARY NUMBERS AND AREAS AS READ IN

| CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 369538 | 4 | 13411 | 8 | 8886 | 7 | 2585797 | 6 | 7509 |
| 12 | 84175 | 800 | 189998 | 13 | 2858 | 10 | 15048 | 11 | 13638 |
| 9 | 22265 | 801 | 6972 | 18 | 1203 | 20 | 1789 | 1009 | 97292 |
| 825 | 1475 | 19 | 21625 | 15 | 6706 | 16 | 5086 | 37 | 301507 |
| 826 | 393 | 36 | 3789 | 31 | 10485 | 30 | 7623 | 39 | 5398 |
| 38 | 166228 | 34 | 599 | 24 | 553 | 831 | 1840 | 848 | 751 |
| 25 | 450 | 861 | 218 | 830 | 888 | 188 | 732 | 189 | 1113 |
| 829 | 320 | 52 | 1486 | 189 | 963 | 53 | 555 | 956 | 897 |
| 60 | 331 | 61 | 592 | 941 | 508 | 41 | 703 | 644 | 463 |
| 609 | 1663 | 610 | 798 | 613 | 737 | 608 | 468 | 612 | 1808 |
| 100 | 334 | 191 | 206 | | | | | | |

TOTAL UNCORRECTED AREA = 3970670
NUMBER OF PEAKS READ IN = 52

* DETAILED HYDROCARBON ANALYSIS, EXCLUDING COMPOUNDS BELOW 0.01 VOLUME PERCENT

NORMAL PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4 | 0.43 | 0.37 | 0.34 | N-BUTANE |
| 6 | 0.19 | 0.19 | 0.19 | N-PENTANE |
| 9 | 0.48 | 0.54 | 0.56 | N-HEXANE |
| 41 | 0.01 | 0.02 | 0.02 | N-NONANE |

108_141103_001 Run 1975 VC #5.txt

ISO-PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 5 | 11.93 | 10.63 | 9.37 | ISOBUTANE | |
| 8 | 0.23 | 0.24 | 0.22 | 22-DIME PROPANE | |
| 7 | 66.73 | 66.52 | 65.09 | ISOPENTANE | |
| 12 | 1.81 | 2.06 | 2.11 | 22-DIME BUTANE | |
| 13 | 0.06 | 0.07 | 0.07 | 23-DIME BUTANE | |
| 10 | 0.32 | 0.37 | 0.38 | 2-ME PENTANE | |
| 11 | 0.29 | 0.33 | 0.34 | 3-ME PENTANE | |
| 18 | 0.02 | 0.03 | 0.03 | 22-DIME PENTANE | |
| 20 | 0.03 | 0.04 | 0.04 | 24-DIME PENTANE | |
| 19 | 0.40 | 0.49 | 0.54 | 23-DIME PENTANE | |
| 15 | 0.12 | 0.16 | 0.17 | 2-ME HEXANE | |
| 16 | 0.09 | 0.12 | 0.13 | 3-ME HEXANE | |
| 37 | 4.87 | 6.89 | 7.51 | 224-TRIME PENTANE | * |
| 36 | 0.06 | 0.08 | 0.09 | 223-TRIME PENTANE | * |
| 31 | 0.17 | 0.24 | 0.26 | 25-DIME HEXANE | |
| 30 | 0.12 | 0.17 | 0.19 | 24-DIME HEXANE | |
| 39 | 0.09 | 0.12 | 0.13 | 234-TRIME PENTANE | * |
| 38 | 2.68 | 3.62 | 4.14 | 233-TRIME PENTANE | * |
| 34 | 0.01 | 0.01 | 0.01 | 2-ME-3-ET PENTANE | |
| 24 | 0.01 | 0.01 | 0.01 | 2-ME HEPTANE | |
| 25 | 0.01 | 0.01 | 0.01 | 3-ME HEPTANE | |
| 52 | 0.02 | 0.03 | 0.04 | 24-DIME HEPTANE | |
| 53 | 0.01 | 0.01 | 0.01 | 26-DIME HEPTANE | |
| 61 | 0.01 | 0.01 | 0.01 | 3-ME OCTANE | |

CYCLOPENTANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 800 | 4.90 | 3.96 | 4.65 | CYCLOPENTANE |
| 801 | 0.15 | 0.14 | 0.17 | ME CYCLOPENTANE |
| 848 | 0.01 | 0.02 | 0.02 | 113T4-TETRME CPENT |

CYCLOHEXANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 825 | 0.03 | 0.03 | 0.04 | CYCLOHEXANE |
| 831 | 0.03 | 0.04 | 0.05 | 1C3-DIME CYCHEXANE |
| 830 | 0.01 | 0.02 | 0.02 | 1T2-DIME CYCHEXANE |
| 956 | 0.01 | 0.02 | 0.02 | 1C3T5-TRIME CYCHEX |
| 941 | 0.01 | 0.01 | 0.01 | 1ME-C3ET CYCHEXANE |

AROMATIC HCS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 609 | 0.02 | 0.03 | 0.04 | 1-ME-3-ET BENZENE | |
| 610 | 0.01 | 0.01 | 0.02 | 1-ME-4-ET BENZENE | |
| 613 | 0.01 | 0.01 | 0.02 | 135-TRIME BENZENE | |
| 612 | 0.03 | 0.03 | 0.04 | 124-TRIME BENZENE | * |

UNCLASSIFIED HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 1009 | 3.47 | 2.20 | 2.72 | ISOBUTANOL |
| 188 | 0.01 | 0.02 | 0.02 | UNCLASS. H.C. C- 8 |

| | | | | |
|---|---|---|---|---|
| 189 | 0.02 | 0.02 | 0.03 | UNCLASS. H.C. C- 9 |
| 189 | 0.01 | 0.02 | 0.02 | UNCLASS. H.C. C- 9 |

SE-30 VC Run 1976 distillate batch 6.txt
CHEVRON RESEARCH GASOLINE ANALYSIS
ASTM DHAX METHOD

Sample ID: Run 1976 vapor condensate overheads
Acquisition Date & Time: 11/10/2014 10:00:04 AM
Channel: C108 (Offline)
Analysis: 108_141110_002.dat

*** DETAILED COMPOSITION, PERCENT ***

| C NO. | PARA | OLEF | NAPH | AROM | UNCL HC | TOTALS BY C # | NORMAL PARA | NON-ALKYL I-PARA | ALKYL I-PARA | CYCLO-PENT | CYCLO-HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| => BY WEIGHT | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 7.03 | **** | **** | **** | 2.74 | 9.77 | 0.27 | 6.76 | **** | **** | **** |
| 5 | 67.31 | **** | 5.10 | **** | **** | 72.41 | 0.20 | 67.10 | **** | 5.10 | **** |
| 6 | 3.82 | **** | 0.22 | **** | **** | 4.05 | 0.62 | 3.20 | **** | 0.19 | 0.04 |
| 7 | 0.96 | **** | 0.01 | **** | **** | 0.98 | **** | 0.96 | **** | **** | 0.01 |
| 8 | 12.42 | **** | 0.07 | **** | 0.01 | 12.51 | **** | 0.47 | 11.95 | **** | 0.07 |
| 9 | 0.08 | **** | 0.05 | 0.10 | 0.04 | 0.28 | 0.01 | 0.07 | **** | 0.02 | 0.03 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 91.63 | **** | 5.46 | 0.10 | 2.81 | 100.00 | 1.11 | 78.57 | 11.95 | 5.31 | 0.15 |
| => BY VOLUME | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 7.99 | **** | **** | **** | 2.22 | 10.21 | 0.30 | 7.70 | **** | **** | **** |
| 5 | 69.06 | **** | 4.36 | **** | **** | 73.41 | 0.21 | 68.85 | **** | 4.36 | **** |
| 6 | 3.72 | **** | 0.19 | **** | **** | 3.91 | 0.60 | 3.12 | **** | 0.16 | 0.03 |
| 7 | 0.89 | **** | 0.01 | **** | **** | 0.90 | **** | 0.89 | **** | **** | 0.01 |
| 8 | 11.25 | **** | 0.06 | **** | 0.01 | 11.32 | **** | 0.43 | 10.82 | **** | 0.06 |
| 9 | 0.07 | **** | 0.04 | 0.08 | 0.04 | 0.23 | 0.01 | 0.06 | **** | 0.02 | 0.03 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 92.99 | **** | 4.65 | 0.08 | 2.28 | 100.00 | 1.11 | 81.06 | 10.82 | 4.53 | 0.12 |
| => BY MOLAR | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 9.02 | **** | **** | **** | 3.51 | 12.53 | 0.35 | 8.67 | **** | **** | **** |
| 5 | 69.50 | **** | 5.42 | **** | **** | 74.91 | 0.21 | 69.29 | **** | 5.42 | **** |
| 6 | 3.30 | **** | 0.20 | **** | **** | 3.50 | 0.54 | 2.77 | **** | 0.17 | 0.03 |
| 7 | 0.72 | **** | 0.01 | **** | **** | 0.73 | **** | 0.72 | **** | **** | 0.01 |
| 8 | 8.10 | **** | 0.04 | **** | 0.01 | 8.16 | **** | 0.31 | 7.80 | **** | 0.04 |
| 9 | 0.05 | **** | 0.03 | 0.07 | 0.02 | 0.17 | 0.01 | 0.04 | **** | 0.01 | 0.02 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.00 | 0.00 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 90.68 | **** | 5.70 | 0.07 | 3.55 | 100.00 | 1.10 | 81.79 | 7.80 | 5.60 | 0.10 |

GRP. TYPE, VOL %: P = 95.16, O = 0.00, N = 4.76, A = 0.08, Saturates = 99.92
DIENE CONTENT = 0 vol ppm AVG MW= 74.5 API GR.= 89.3 SP. GR.= 0.6409
OCTANE NUMBER: (from pure values) RON = 93.8 MON = 90.8
(from blending values) RON = 92.4 MON = 88.3
CARBON-HYDROGEN RATIO = 5.042 STOICH. AIR-FUEL RATIO = 15.25 lbs air/lbs fuel
BTU/lb = 19251 NET, 20735 GROSS; BTU/gal = 102958 NET, 110897 GROSS
REID VAPOR PRESSURE = 21.7 BROMINE NO. = 0.0

* DISTILLATION CURVES

SE-30 VC Run 1976 distillate batch 6.txt

| VOL % | TBP | D86 |
|---|---|---|
| 0 | 11 | 83 |
| 5 | 11 | 83 |
| 10 | 82 | 83 |
| 15 | 82 | 83 |
| 20 | 82 | 83 |
| 25 | 82 | 83 |
| 30 | 82 | 83 |
| 35 | 82 | 83 |
| 40 | 82 | 83 |
| 45 | 82 | 83 |
| 50 | 82 | 83 |
| 55 | 82 | 83 |
| 60 | 82 | 83 |
| 65 | 82 | 83 |
| 70 | 82 | 83 |
| 75 | 82 | 83 |
| 80 | 121 | 121 |
| 85 | 156 | 181 |
| 90 | 211 | 210 |
| 95 | 211 | 236 |
| 100 | 365 | 238 |

* COMPOUND DICTIONARY NUMBERS AND AREAS AS READ IN

| CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 202431 | 4 | 8093 | 8 | 5875 | 7 | 2018075 | 6 | 6109 |
| 12 | 70674 | 800 | 158259 | 13 | 2365 | 10 | 12660 | 11 | 11270 |
| 9 | 18822 | 801 | 5800 | 18 | 1070 | 20 | 1480 | 1009 | 74282 |
| 825 | 1152 | 19 | 17192 | 15 | 5442 | 16 | 4139 | 37 | 233511 |
| 826 | 341 | 36 | 2847 | 31 | 7693 | 30 | 5681 | 39 | 4014 |
| 38 | 123819 | 34 | 551 | 24 | 385 | 831 | 1394 | 848 | 634 |
| 830 | 699 | 188 | 462 | 189 | 818 | 52 | 962 | 189 | 487 |
| 54 | 890 | 956 | 631 | 61 | 223 | 941 | 368 | 41 | 431 |
| 644 | 229 | 609 | 890 | 610 | 536 | 613 | 378 | 608 | 306 |
| 612 | 1083 | 191 | 313 | | | | | | |

TOTAL UNCORRECTED AREA = 3015766
NUMBER OF PEAKS READ IN = 47

* DETAILED HYDROCARBON ANALYSIS, EXCLUDING COMPOUNDS BELOW 0.01 VOLUME PERCENT

NORMAL PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4 | 0.35 | 0.30 | 0.27 | N-BUTANE |
| 6 | 0.21 | 0.21 | 0.20 | N-PENTANE |
| 9 | 0.54 | 0.60 | 0.62 | N-HEXANE |
| 41 | 0.01 | 0.01 | 0.01 | N-NONANE |

SE-30 VC Run 1976 distillate batch 6.txt

ISO-PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 5 | 8.67 | 7.70 | 6.76 | ISOBUTANE | |
| 8 | 0.20 | 0.21 | 0.19 | 22-DIME PROPANE | |
| 7 | 69.09 | 68.64 | 66.91 | ISOPENTANE | |
| 12 | 2.02 | 2.29 | 2.33 | 22-DIME BUTANE | |
| 13 | 0.07 | 0.08 | 0.08 | 23-DIME BUTANE | |
| 10 | 0.36 | 0.41 | 0.42 | 2-ME PENTANE | |
| 11 | 0.32 | 0.36 | 0.37 | 3-ME PENTANE | |
| 18 | 0.03 | 0.03 | 0.04 | 22-DIME PENTANE | |
| 20 | 0.04 | 0.05 | 0.05 | 24-DIME PENTANE | |
| 19 | 0.42 | 0.52 | 0.57 | 23-DIME PENTANE | |
| 15 | 0.13 | 0.17 | 0.18 | 2-ME HEXANE | |
| 16 | 0.10 | 0.13 | 0.14 | 3-ME HEXANE | |
| 37 | 5.00 | 7.06 | 7.66 | 224-TRIME PENTANE | * |
| 36 | 0.06 | 0.08 | 0.09 | 223-TRIME PENTANE | * |
| 31 | 0.16 | 0.23 | 0.25 | 25-DIME HEXANE | |
| 30 | 0.12 | 0.17 | 0.19 | 24-DIME HEXANE | |
| 39 | 0.09 | 0.12 | 0.13 | 234-TRIME PENTANE | * |
| 38 | 2.65 | 3.57 | 4.06 | 233-TRIME PENTANE | * |
| 34 | 0.01 | 0.02 | 0.02 | 2-ME-3-ET PENTANE | |
| 24 | 0.01 | 0.01 | 0.01 | 2-ME HEPTANE | |
| 52 | 0.02 | 0.03 | 0.03 | 24-DIME HEPTANE | |
| 54 | 0.02 | 0.03 | 0.03 | 25-DIME HEPTANE | |

CYCLOPENTANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 800 | 5.42 | 4.36 | 5.10 | CYCLOPENTANE |
| 801 | 0.17 | 0.16 | 0.19 | ME CYCLOPENTANE |
| 848 | 0.01 | 0.02 | 0.02 | 113T4-TETRME CPENT |

CYCLOHEXANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 825 | 0.03 | 0.03 | 0.04 | CYCLOHEXANE |
| 831 | 0.03 | 0.04 | 0.04 | 1C3-DIME CYCHEXANE |
| 830 | 0.01 | 0.02 | 0.02 | 1T2-DIME CYCHEXANE |
| 956 | 0.01 | 0.02 | 0.02 | 1C3T5-TRIME CYCHEX |

AROMATIC HCS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 609 | 0.02 | 0.02 | 0.03 | 1-ME-3-ET BENZENE | |
| 610 | 0.01 | 0.01 | 0.02 | 1-ME-4-ET BENZENE | |
| 612 | 0.02 | 0.02 | 0.03 | 124-TRIME BENZENE | * |

UNCLASSIFIED HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 1009 | 3.51 | 2.22 | 2.74 | ISOBUTANOL |
| 188 | 0.01 | 0.01 | 0.01 | UNCLASS. H.C. C- 8 |
| 189 | 0.02 | 0.02 | 0.03 | UNCLASS. H.C. C- 9 |
| 189 | 0.01 | 0.01 | 0.02 | UNCLASS. H.C. C- 9 |

SE-30 VC- Run 1986 distillate batch 7.txt
CHEVRON RESEARCH GASOLINE ANALYSIS
ASTM DHAX METHOD

Sample ID: Run 1986 vapor condensate
Acquisition Date & Time: 11/18/2014 11:10:01 AM
Channel: C108 (Offline)
Analysis: 108_141118_002.dat

*** DETAILED COMPOSITION, PERCENT ***

| C NO. | PARA | OLEF | NAPH | AROM | UNCL HC | TOTALS BY C # | NORMAL PARA | NON-ALKYL I-PARA | ALKYL I-PARA | CYCLO-PENT | CYCLO-HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| => BY WEIGHT | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 6.40 | **** | **** | **** | 3.81 | 10.21 | 0.26 | 6.14 | **** | **** | **** |
| 5 | 63.18 | **** | 5.13 | **** | **** | 68.32 | 0.19 | 62.99 | **** | 5.13 | **** |
| 6 | 3.92 | **** | 0.25 | **** | **** | 4.17 | 0.68 | 3.24 | **** | 0.21 | 0.04 |
| 7 | 1.17 | **** | 0.05 | **** | **** | 1.22 | 0.02 | 1.14 | **** | 0.01 | 0.04 |
| 8 | 15.54 | **** | 0.11 | **** | 0.03 | 15.67 | **** | 0.67 | 14.87 | 0.01 | 0.10 |
| 9 | 0.12 | **** | 0.07 | 0.15 | 0.06 | 0.40 | 0.03 | 0.10 | **** | 0.03 | 0.04 |
| 10 | 0.02 | **** | **** | **** | **** | 0.02 | 0.02 | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 90.35 | **** | 5.60 | 0.15 | 3.90 | 100.00 | 1.19 | 74.29 | 14.87 | 5.38 | 0.23 |
| => BY VOLUME | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 7.33 | **** | **** | **** | 3.11 | 10.44 | 0.29 | 7.04 | **** | **** | **** |
| 5 | 65.32 | **** | 4.42 | **** | **** | 69.74 | 0.19 | 65.13 | **** | 4.42 | **** |
| 6 | 3.85 | **** | 0.21 | **** | **** | 4.06 | 0.66 | 3.19 | **** | 0.18 | 0.04 |
| 7 | 1.09 | **** | 0.04 | **** | **** | 1.13 | 0.02 | 1.07 | **** | 0.01 | 0.03 |
| 8 | 14.18 | **** | 0.09 | **** | 0.02 | 14.29 | **** | 0.62 | 13.56 | 0.01 | 0.08 |
| 9 | 0.11 | **** | 0.06 | 0.11 | 0.05 | 0.33 | 0.02 | 0.09 | **** | 0.02 | 0.03 |
| 10 | 0.01 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 91.89 | **** | 4.81 | 0.11 | 3.19 | 100.00 | 1.20 | 77.13 | 13.56 | 4.63 | 0.19 |
| => BY MOLAR | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 8.31 | **** | **** | **** | 4.95 | 13.26 | 0.34 | 7.97 | **** | **** | **** |
| 5 | 66.05 | **** | 5.52 | **** | **** | 71.57 | 0.20 | 65.86 | **** | 5.52 | **** |
| 6 | 3.43 | **** | 0.23 | **** | **** | 3.65 | 0.59 | 2.84 | **** | 0.19 | 0.04 |
| 7 | 0.88 | **** | 0.04 | **** | **** | 0.92 | 0.02 | 0.86 | **** | 0.01 | 0.03 |
| 8 | 10.26 | **** | 0.07 | **** | 0.02 | 10.35 | **** | 0.44 | 9.82 | 0.01 | 0.07 |
| 9 | 0.07 | **** | 0.04 | 0.09 | 0.03 | 0.24 | 0.02 | 0.06 | **** | 0.02 | 0.03 |
| 10 | 0.01 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 89.01 | **** | 5.89 | 0.09 | 5.00 | 100.00 | 1.17 | 78.02 | 9.82 | 5.73 | 0.16 |

GRP. TYPE, VOL %: P = 94.91, O = 0.00, N = 4.97, A = 0.11, Saturates = 99.89
DIENE CONTENT = 0 vol ppm AVG MW= 75.4 API GR.= 87.6 SP. GR.= 0.6458
OCTANE NUMBER: (from pure values) RON = 94.0 MON = 90.8
(from blending values) RON = 92.5 MON = 88.3
CARBON-HYDROGEN RATIO = 5.054 STOICH. AIR-FUEL RATIO = 15.24 lbs air/lbs fuel
BTU/lb = 19228 NET, 20688 GROSS; BTU/gal = 103622 NET, 111492 GROSS
REID VAPOR PRESSURE = 20.5 BROMINE NO. = 0.0

* DISTILLATION CURVES

SE-30 VC- Run 1986 distillate batch 7.txt

| VOL % | TBP | D86 |
|---|---|---|
| 0 | 11 | 83 |
| 5 | 11 | 83 |
| 10 | 82 | 83 |
| 15 | 82 | 83 |
| 20 | 82 | 83 |
| 25 | 82 | 83 |
| 30 | 82 | 83 |
| 35 | 82 | 83 |
| 40 | 82 | 83 |
| 45 | 82 | 83 |
| 50 | 82 | 83 |
| 55 | 82 | 83 |
| 60 | 82 | 83 |
| 65 | 82 | 83 |
| 70 | 82 | 83 |
| 75 | 121 | 121 |
| 80 | 146 | 162 |
| 85 | 194 | 210 |
| 90 | 211 | 210 |
| 95 | 239 | 238 |
| 100 | 345 | 243 |

* COMPOUND DICTIONARY NUMBERS AND AREAS AS READ IN

| CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 209833 | 4 | 8839 | 8 | 6237 | 7 | 2162637 | 6 | 6536 |
| 12 | 80113 | 800 | 181776 | 13 | 2893 | 10 | 15310 | 11 | 13747 |
| 9 | 23386 | 801 | 7324 | 18 | 1363 | 20 | 1866 | 1009 | 118051 |
| 825 | 1578 | 19 | 23443 | 15 | 7338 | 16 | 5707 | 806 | 245 |
| 37 | 326824 | 14 | 788 | 826 | 1446 | 36 | 4186 | 31 | 11462 |
| 30 | 8430 | 39 | 5805 | 38 | 180420 | 34 | 823 | 24 | 1206 |
| 26 | 471 | 831 | 1996 | 848 | 897 | 25 | 950 | 861 | 264 |
| 830 | 1071 | 188 | 894 | 189 | 1500 | 829 | 404 | 52 | 1522 |
| 189 | 539 | 53 | 451 | 956 | 932 | 60 | 720 | 61 | 684 |
| 941 | 551 | 41 | 928 | 644 | 423 | 609 | 1465 | 610 | 770 |
| 613 | 740 | 608 | 398 | 612 | 1726 | 100 | 534 | | |

TOTAL UNCORRECTED AREA = 3440442
NUMBER OF PEAKS READ IN = 54

* DETAILED HYDROCARBON ANALYSIS, EXCLUDING COMPOUNDS BELOW 0.01 VOLUME PERCENT

NORMAL PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4 | 0.34 | 0.29 | 0.26 | N-BUTANE |
| 6 | 0.20 | 0.19 | 0.19 | N-PENTANE |
| 9 | 0.59 | 0.66 | 0.68 | N-HEXANE |
| 14 | 0.02 | 0.02 | 0.02 | N-HEPTANE |

| | | | | |
|---|---|---|---|---|
| 41 | 0.02 | 0.02 | 0.03 | N-NONANE |
| 100 | 0.01 | 0.01 | 0.02 | N-DECANE |

ISO-PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 5 | 7.97 | 7.04 | 6.14 | ISOBUTANE | |
| 8 | 0.19 | 0.20 | 0.18 | 22-DIME PROPANE | |
| 7 | 65.67 | 64.93 | 62.81 | ISOPENTANE | |
| 12 | 2.03 | 2.29 | 2.32 | 22-DIME BUTANE | |
| 13 | 0.07 | 0.08 | 0.08 | 23-DIME BUTANE | |
| 10 | 0.39 | 0.43 | 0.44 | 2-ME PENTANE | |
| 11 | 0.35 | 0.38 | 0.40 | 3-ME PENTANE | |
| 18 | 0.03 | 0.04 | 0.04 | 22-DIME PENTANE | |
| 20 | 0.04 | 0.05 | 0.05 | 24-DIME PENTANE | |
| 19 | 0.51 | 0.62 | 0.68 | 23-DIME PENTANE | |
| 15 | 0.16 | 0.20 | 0.21 | 2-ME HEXANE | |
| 16 | 0.12 | 0.15 | 0.16 | 3-ME HEXANE | |
| 37 | 6.21 | 8.72 | 9.40 | 224-TRIME PENTANE | * |
| 36 | 0.08 | 0.11 | 0.12 | 223-TRIME PENTANE | * |
| 31 | 0.22 | 0.30 | 0.33 | 25-DIME HEXANE | |
| 30 | 0.16 | 0.22 | 0.24 | 24-DIME HEXANE | |
| 39 | 0.11 | 0.15 | 0.17 | 234-TRIME PENTANE | * |
| 38 | 3.43 | 4.59 | 5.19 | 233-TRIME PENTANE | * |
| 34 | 0.02 | 0.02 | 0.02 | 2-ME-3-ET PENTANE | |
| 24 | 0.02 | 0.03 | 0.03 | 2-ME HEPTANE | |
| 26 | 0.01 | 0.01 | 0.01 | 4-ME HEPTANE | |
| 25 | 0.02 | 0.02 | 0.03 | 3-ME HEPTANE | |
| 52 | 0.03 | 0.04 | 0.04 | 24-DIME HEPTANE | |
| 53 | 0.01 | 0.01 | 0.01 | 26-DIME HEPTANE | |
| 60 | 0.01 | 0.02 | 0.02 | 2-ME OCTANE | |
| 61 | 0.01 | 0.02 | 0.02 | 3-ME OCTANE | |

CYCLOPENTANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 800 | 5.52 | 4.42 | 5.13 | CYCLOPENTANE |
| 801 | 0.19 | 0.18 | 0.21 | ME CYCLOPENTANE |
| 848 | 0.02 | 0.02 | 0.03 | 113T4-TETRME CPENT |

CYCLOHEXANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 825 | 0.04 | 0.04 | 0.04 | CYCLOHEXANE |
| 826 | 0.03 | 0.03 | 0.04 | ME CYCLOHEXANE |
| 831 | 0.04 | 0.05 | 0.06 | 1C3-DIME CYCHEXANE |
| 830 | 0.02 | 0.03 | 0.03 | 1T2-DIME CYCHEXANE |
| 956 | 0.02 | 0.02 | 0.03 | 1C3T5-TRIME CYCHEX |
| 941 | 0.01 | 0.01 | 0.02 | 1ME-C3ET CYCHEXANE |

AROMATIC HCS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 609 | 0.02 | 0.03 | 0.04 | 1-ME-3-ET BENZENE | |
| 610 | 0.01 | 0.02 | 0.02 | 1-ME-4-ET BENZENE | |
| 613 | 0.01 | 0.01 | 0.02 | 135-TRIME BENZENE | |
| 612 | 0.03 | 0.03 | 0.05 | 124-TRIME BENZENE | * |

SE-30 VC- Run 1986 distillate batch 7.txt

UNCLASSIFIED HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 1009 | 4.95 | 3.11 | 3.81 | ISOBUTANOL |
| 188 | 0.02 | 0.02 | 0.03 | UNCLASS. H.C. C- 8 |
| 189 | 0.03 | 0.04 | 0.04 | UNCLASS. H.C. C- 9 |
| 189 | 0.01 | 0.01 | 0.02 | UNCLASS. H.C. C- 9 |

SE-30 VC- Batch 9 Run 2022 distillate.txt
CHEVRON RESEARCH GASOLINE ANALYSIS
ASTM DHAX METHOD

Sample ID: VC Run 2022 Batch 9 distillate
Acquisition Date & Time: 1/26/2015 12:07:23 PM
Channel: C108 (Offline)
Analysis: 108_150126_003.dat

*** DETAILED COMPOSITION, PERCENT ***

| C NO. | PARA | OLEF | NAPH | AROM | UNCL HC | TOTALS BY C # | NORMAL PARA | NON-ALKYL I-PARA | ALKYL I-PARA | CYCLO-PENT | CYCLO-HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| => BY WEIGHT | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 9.80 | **** | **** | **** | 2.51 | 12.30 | 0.33 | 9.47 | **** | **** | **** |
| 5 | 66.27 | **** | 4.89 | **** | **** | 71.16 | 0.19 | 66.08 | **** | 4.89 | **** |
| 6 | 3.63 | **** | 0.21 | **** | **** | 3.84 | 0.56 | 3.07 | **** | 0.17 | 0.04 |
| 7 | 0.86 | **** | 0.01 | **** | **** | 0.87 | **** | 0.86 | **** | **** | 0.01 |
| 8 | 11.43 | **** | 0.10 | **** | 0.02 | 11.55 | **** | 0.45 | 10.98 | **** | 0.10 |
| 9 | 0.06 | **** | 0.05 | 0.12 | 0.04 | 0.26 | 0.02 | 0.04 | **** | 0.02 | 0.03 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.02 | 0.02 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 92.04 | **** | 5.26 | 0.12 | 2.58 | 100.00 | 1.11 | 79.96 | 10.98 | 5.08 | 0.18 |
| => BY VOLUME | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 11.08 | **** | **** | **** | 2.02 | 13.10 | 0.36 | 10.72 | **** | **** | **** |
| 5 | 67.64 | **** | 4.15 | **** | **** | 71.79 | 0.20 | 67.44 | **** | 4.15 | **** |
| 6 | 3.52 | **** | 0.18 | **** | **** | 3.69 | 0.54 | 2.98 | **** | 0.15 | 0.03 |
| 7 | 0.79 | **** | 0.01 | **** | **** | 0.80 | **** | 0.79 | **** | **** | 0.01 |
| 8 | 10.29 | **** | 0.08 | **** | 0.02 | 10.39 | **** | 0.41 | 9.89 | **** | 0.08 |
| 9 | 0.05 | **** | 0.04 | 0.08 | 0.03 | 0.21 | 0.02 | 0.04 | **** | 0.02 | 0.02 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.02 | 0.02 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 93.37 | **** | 4.46 | 0.08 | 2.08 | 100.00 | 1.11 | 82.37 | 9.89 | 4.32 | 0.14 |
| => BY MOLAR | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 12.42 | **** | **** | **** | 3.18 | 15.61 | 0.42 | 12.01 | **** | **** | **** |
| 5 | 67.71 | **** | 5.14 | **** | **** | 72.85 | 0.20 | 67.51 | **** | 5.14 | **** |
| 6 | 3.10 | **** | 0.18 | **** | **** | 3.29 | 0.48 | 2.62 | **** | 0.15 | 0.03 |
| 7 | 0.63 | **** | 0.01 | **** | **** | 0.64 | **** | 0.63 | **** | **** | 0.01 |
| 8 | 7.38 | **** | 0.06 | **** | 0.01 | 7.45 | **** | 0.29 | 7.09 | **** | 0.06 |
| 9 | 0.04 | **** | 0.03 | 0.07 | 0.02 | 0.16 | 0.01 | 0.02 | **** | 0.01 | 0.02 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 91.28 | **** | 5.42 | 0.07 | 3.22 | 100.00 | 1.11 | 83.08 | 7.09 | 5.30 | 0.12 |

GRP. TYPE, VOL %: P = 95.36, O = 0.00, N = 4.55, A = 0.09, Saturates = 99.91
DIENE CONTENT = 0 vol ppm AVG MW= 73.7 API GR.= 90.5 SP. GR.= 0.6375
OCTANE NUMBER: (from pure values) RON = 94.0 MON = 91.0
(from blending values) RON = 92.7 MON = 88.5
CARBON-HYDROGEN RATIO = 5.031 STOICH. AIR-FUEL RATIO = 15.26 lbs air/lbs fuel
BTU/lb = 19258 NET, 20752 GROSS; BTU/gal = 102455 NET, 110403 GROSS
REID VAPOR PRESSURE = 23.7 BROMINE NO. = 0.0

* DISTILLATION CURVES

SE-30 VC- Batch 9 Run 2022 distillate.txt

| VOL % | TBP | D86 |
|---|---|---|
| 0 | 11 | 83 |
| 5 | 11 | 83 |
| 10 | 11 | 83 |
| 15 | 82 | 83 |
| 20 | 82 | 83 |
| 25 | 82 | 83 |
| 30 | 82 | 83 |
| 35 | 82 | 83 |
| 40 | 82 | 83 |
| 45 | 82 | 83 |
| 50 | 82 | 83 |
| 55 | 82 | 83 |
| 60 | 82 | 83 |
| 65 | 82 | 83 |
| 70 | 82 | 83 |
| 75 | 82 | 83 |
| 80 | 121 | 121 |
| 85 | 122 | 156 |
| 90 | 211 | 210 |
| 95 | 211 | 228 |
| 100 | 365 | 238 |

* COMPOUND DICTIONARY NUMBERS AND AREAS AS READ IN

| CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 254937 | 4 | 8913 | 8 | 5864 | 7 | 1787652 | 6 | 5247 |
| 12 | 60750 | 800 | 136495 | 13 | 2102 | 10 | 10893 | 11 | 9821 |
| 9 | 15358 | 801 | 4836 | 18 | 856 | 20 | 1191 | 1009 | 61201 |
| 825 | 996 | 19 | 13802 | 15 | 4278 | 16 | 3342 | 37 | 191556 |
| 826 | 387 | 36 | 2403 | 31 | 6567 | 30 | 4931 | 39 | 3379 |
| 38 | 103735 | 34 | 439 | 24 | 381 | 831 | 1224 | 848 | 524 |
| 830 | 591 | 188 | 496 | 189 | 707 | 827 | 924 | 189 | 325 |
| 54 | 987 | 956 | 519 | 61 | 202 | 941 | 297 | 41 | 498 |
| 644 | 277 | 609 | 842 | 610 | 465 | 613 | 400 | 608 | 300 |
| 612 | 1127 | 191 | 525 | | | | | | |

TOTAL UNCORRECTED AREA = 2713542
NUMBER OF PEAKS READ IN = 47

* DETAILED HYDROCARBON ANALYSIS, EXCLUDING COMPOUNDS BELOW 0.01 VOLUME PERCENT

NORMAL PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4 | 0.42 | 0.36 | 0.33 | N-BUTANE |
| 6 | 0.20 | 0.20 | 0.19 | N-PENTANE |
| 9 | 0.48 | 0.54 | 0.56 | N-HEXANE |
| 41 | 0.01 | 0.02 | 0.02 | N-NONANE |

SE-30 VC- Batch 9 Run 2022 distillate.txt

ISO-PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 5 | 12.01 | 10.72 | 9.47 | ISOBUTANE | |
| 8 | 0.22 | 0.23 | 0.22 | 22-DIME PROPANE | |
| 7 | 67.29 | 67.21 | 65.86 | ISOPENTANE | |
| 12 | 1.91 | 2.17 | 2.23 | 22-DIME BUTANE | |
| 13 | 0.07 | 0.07 | 0.08 | 23-DIME BUTANE | |
| 10 | 0.34 | 0.39 | 0.40 | 2-ME PENTANE | |
| 11 | 0.31 | 0.34 | 0.36 | 3-ME PENTANE | |
| 18 | 0.02 | 0.03 | 0.03 | 22-DIME PENTANE | |
| 20 | 0.03 | 0.04 | 0.04 | 24-DIME PENTANE | |
| 19 | 0.37 | 0.46 | 0.50 | 23-DIME PENTANE | |
| 15 | 0.12 | 0.15 | 0.16 | 2-ME HEXANE | |
| 16 | 0.09 | 0.11 | 0.12 | 3-ME HEXANE | |
| 37 | 4.51 | 6.40 | 6.99 | 224-TRIME PENTANE | * |
| 36 | 0.06 | 0.08 | 0.09 | 223-TRIME PENTANE | * |
| 31 | 0.15 | 0.22 | 0.24 | 25-DIME HEXANE | |
| 30 | 0.12 | 0.16 | 0.18 | 24-DIME HEXANE | |
| 39 | 0.08 | 0.11 | 0.12 | 234-TRIME PENTANE | * |
| 38 | 2.44 | 3.30 | 3.78 | 233-TRIME PENTANE | * |
| 34 | 0.01 | 0.01 | 0.02 | 2-ME-3-ET PENTANE | |
| 24 | 0.01 | 0.01 | 0.01 | 2-ME HEPTANE | |
| 54 | 0.02 | 0.03 | 0.04 | 25-DIME HEPTANE | |

CYCLOPENTANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 800 | 5.14 | 4.15 | 4.89 | CYCLOPENTANE |
| 801 | 0.15 | 0.15 | 0.17 | ME CYCLOPENTANE |
| 848 | 0.01 | 0.02 | 0.02 | 113T4-TETRME CPENT |

CYCLOHEXANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 825 | 0.03 | 0.03 | 0.04 | CYCLOHEXANE |
| 826 | 0.01 | 0.01 | 0.01 | ME CYCLOHEXANE |
| 831 | 0.03 | 0.04 | 0.04 | 1C3-DIME CYCHEXANE |
| 830 | 0.01 | 0.02 | 0.02 | 1T2-DIME CYCHEXANE |
| 827 | 0.02 | 0.03 | 0.03 | ETHYL CYCLOHEXANE |
| 956 | 0.01 | 0.02 | 0.02 | 1C3T5-TRIME CYCHEX |

AROMATIC HCS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 609 | 0.02 | 0.02 | 0.03 | 1-ME-3-ET BENZENE | |
| 610 | 0.01 | 0.01 | 0.02 | 1-ME-4-ET BENZENE | |
| 612 | 0.02 | 0.03 | 0.04 | 124-TRIME BENZENE | * |

UNCLASSIFIED HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 1009 | 3.18 | 2.02 | 2.51 | ISOBUTANOL |
| 188 | 0.01 | 0.02 | 0.02 | UNCLASS. H.C. C- 8 |
| 189 | 0.01 | 0.02 | 0.03 | UNCLASS. H.C. C- 9 |
| 191 | 0.01 | 0.02 | 0.02 | UNCLASS. H.C. C-11 |

## Annex 2 Formulation analysis report

# Analytical Report

# Gasoline Isobutanol Vapor Condensate Analysis

# In Support of:

# Gasoline Isobutanol Vapor Condensate: A 13-Week Inhalation (Whole-Body) Toxicity Study in Rats with Neurotoxicity, Genotoxicity and Immunotoxicity Assessments and with a 4 Week Recovery (GLP)

On 21 September 2015 the legal entity Huntingdon Life Sciences, Inc was renamed as Envigo CRS, Inc. No other changes to the legal entity have occurred.

| | |
|---|---|
| **Envigo study number:** | 14-6485 |
| **Method number:** | HLS-005-15R2 |
| **Version:** | Final Report |
| **Issue date:** | 23 March 2016 |

# Sponsor and Testing Facility Details

| | |
|---|---|
| **Sponsor** | Butamax Advanced Biofuels, LLC<br>200 Powder Mill Road<br>E356 Third Floor<br>Wilmington, DE 19880-0356<br>USA |
| **Testing Facility** | Envigo<br>Princeton Research Center<br>P.O. Box 2360<br>East Millstone, NJ 08875-2360<br>USA |

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# Signatures

## Gasoline Isobutanol Vapor Condensate Analysis

## Study Management

The following scientist was responsible for the overall conduct of this phase of study:

[redacted] 23 Mar 16

Yonggang Wang, MA
Contributing Scientist
Formulation and Inhalation Analysis
Envigo

Date

## Scientific Review and Approval

The following scientist has reviewed and approved this report:

[redacted] 23 Mar 16

Nicki Iacono, BS
Vice President
Bioanalytical and Translational Sciences
Envigo

Date

# Study Personnel

## Study Management

Nicki Iacono, BS
Vice President
Bioanalytical and Translational Sciences

Yonggang Wang, MA
Contributing Scientist
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Gregory Parisi, BS
Scientist
Formulation and Inhalation Analysis

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Scientist
Formulation and Inhalation Analysis

# General Preface

This section provides a key to abbreviations and formulas commonly used throughout this report.

## List of Abbreviations

| | |
|---|---|
| $CS_2$ | Carbon Disulfide |
| FIA | Formulation and Inhalation Analysis |
| FID | Flame ionization detection |
| GC | Gas Chromatography |
| HLS | Huntingdon Life Sciences |
| IR | Infrared |
| µm | micrometer |
| m | meter |
| $mg/m^3$ | milligram/cubic meter |
| mm | millimeter |
| mV | millivolt |
| min | minute |
| PRC | Princeton Research Center |

# Summary

Samples of the test substance (Gasoline Isobutanol Vapor Condensate) were analyzed to characterize at least ten major components (comprising at least 80% by weight of the test substance) to show test substance stability and comparison between the neat liquid test substance and the vaporized test atmospheres. The analytical method (HLS-005-15R2) was validated at Envigo in Study No. 15-8287. The method involved the extraction of Gasoline Isobutanol Vapor Condensate from charcoal tubes with Carbon Disulfide ($CS_2$). The major components of the test substance were then characterized (relative area percent) utilizing Gas Chromatography with Flame Ionization Detection (FID).

# 1. Experimental Procedures

The charcoal tubes from each exposure chamber were received from the Inhalation Department at Envigo. These samples were analyzed to determine the percent of total peak area of the major components of Gasoline Isobutanol Vapor Condensate listed in method HLS-005-15R2. The samples were extracted with Carbon Disulfide ($CS_2$). The extracted solutions were analyzed by Gas Chromatography equipped with a Supelco Petrocol™ DH 150 (150m x 0.25mm, 1.0 μm) column and Flame Ionization Detector (FID).

# 2. Materials

**Test substance:** Gasoline Isobutanol Vapor Condensate

# 3. Analysis

The analytical method (HLS-005-15R2) was not validated at the time it was used for this study; however, it was subsequently validated by the department of Formulation and Inhalation Analysis at Envigo, PRC in Study No. 15-8287. Details of the analytical method and method validation are maintained in the study file for Study No. 15-8287.

## 3.1. Exposure concentration determination

During each exposure, one charcoal tube sample per chamber pretest and per week was analyzed by gas chromatography to characterize at least 10 major components (comprising at least 80% by weight of the test substance) to show test substance stability and provide a comparison between the neat liquid test substance and the vaporized test atmospheres. The charcoal tubes were stored refrigerated (2 to 8ºC) for up to 7 days (based on stability assessment) unless extracted and analyzed on the same day of collection.

# 4. Data Acquisition and Integration

All data collection, processing and storage were performed using the Perkin-Elmer Nelson TotalChrom version 6.2.1 installed on a personal computer.

# 5. Good Laboratory Practices

The study was conducted in compliance with the following Good Laboratory Practice standards:

United States EPA 79.60, CFR Vol. 59, No. 122, 27 June 1994

# 6. Archiving of Data

All data documenting experimental details were recorded and maintained as raw data in appropriate laboratory binders. At the completion of the study, all reports and raw data will be

maintained in the archives of Envigo for a period of 1 year after the submission of the signed final report, upon which time the client will be contacted to determine disposition of the records. Testing Facility-generated electronic raw data will be stored on the computer system on which the data application resides or archived off-line.

# 7. Results and Discussion

A summary of analytical runs is presented in Table 1. Typical GC chromatograms of Groups 1 through 4 are shown in Figure 1, Figure 2, Figure 3 and Figure 4.

Samples taken during the exposures were analyzed to determine the area percent of the test substance's major components in the chamber. The results of spiked control samples are presented in Table 2, and animal exposure results are presented in Table 3 through Table 16.

On Exposure Day 20, the samples 1005M and 1005F from the Group 1 air control chambers showed results similar in profile to results routinely seen from samples collected from the Groups 2-4 test substance chambers. An investigation of these results did not find any evidence of improper sample collection or contamination during sample processing and analysis. However, the IR continuous atmosphere monitoring instrument showed no appreciable test substance in the Group 1 chambers and no other Group 1 samples during this study showed similar results, including duplicate Group 1 samples collected on the same day. Further, it is unlikely there was sufficient leak of test substance into the room air that also supplied the air into the Group 1 chambers. The results are anomalous and occurred nowhere else during the course of the study.

## Table 1 Analytical run summary

| Date of Analysis | Analytical Run Number | Description |
|---|---|---|
| 27 February 2015 – 01 March 2015 | 001 | Exposure Days 4 and 5 |
| 06-07 March 2015 | 002 | Exposure Days 9 and 10 |
| 13-14 March 2015 | 003 | Exposure Days 14 and 15 |
| 23-25 March 2015 | 004 | Exposure Days 19 and 20 |
| 27-29 March 2015 | 005 | Exposure Days 24 and 25 |
| 03-07 April 2015 | 006 | Exposure Days 29 and 30 |
| 10-11 April 2015 | 007 | Exposure Days 34 and 35 |
| 17-18 April 2015 | 008 | Exposure Days 39 and 40 |
| 24-25 April 2015 | 009 | Exposure Days 44 and 45 |
| 01-02 May 2015 | 010 | Exposure Days 49 and 50 |
| 08-09 May 2015 | 011 | Exposure Days 54 and 55 |
| 15-16 May 2015 | 013 | Exposure Days 59 and 60 |
| 22-23 May 2015 | 014 | Exposure Days 64 and 65 |
| 28-29 May 2015 | 015 | Exposure Days 67 and 68 |

**Table 2 Spiked control samples**

(Area %)

| Compound | Exposure Days 4/5 | | Exposure Days 9/10 | | Exposure Days 14/15 | | Exposure Days 19/20 | |
|---|---|---|---|---|---|---|---|---|
| | Spiked Control A | Spiked Control B | Spiked Control A | Spiked Control B | Spiked Control A | Spiked Control B | Spiked Control A | Spiked Control B |
| Isobutane | 4.3 | 4.8 | 4.1 | 3.7 | 5.7 | 6.5 | 6.5 | 6.5 |
| N-Butane | 0.2 | 0.2 | 0.2 | 0.2 | 0.0 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 62.8 | 63.3 | 62.5 | 62.1 | 64.0 | 63.9 | 64.4 | 64.3 |
| N-Pentane | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 2.5 | 2.5 | 2.5 | 2.5 | 2.4 | 2.3 | 2.3 | 2.3 |
| Cyclopentane | 5.8 | 5.7 | 5.8 | 5.8 | 5.6 | 5.4 | 5.4 | 5.4 |
| 2-Methylpentane | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| 3-Methylpentane | 0.5 | 0.5 | 0.5 | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.8 | 0.8 | 0.8 | 0.8 | 0.7 | 0.7 | 0.7 | 0.7 |
| Isobutanol | 3.0 | 2.9 | 3.2 | 3.4 | 2.7 | 2.7 | 2.6 | 2.6 |
| Methylcyclopentane | 0.2 | 0.2 | 0.2 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.8 | 0.8 | 0.8 | 0.9 | 0.8 | 0.7 | 0.7 | 0.7 |
| 3-Methylhexane | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2,4-Trimethylpentane | 11.7 | 11.3 | 11.9 | 12.3 | 10.7 | 10.3 | 10.2 | 10.2 |
| 2,3,3-trimethylpentane | 6.1 | 5.9 | 6.2 | 6.4 | 5.6 | 5.4 | 5.1 | 5.3 |

**Table 2 (continued) Spiked control samples**

(Area %)

| Compound | Exposure Days 24/25 | | Exposure Days 29/30 | | Exposure Days 34/35 | | Exposure Days 39/40 | |
|---|---|---|---|---|---|---|---|---|
| | Spiked Control A | Spiked Control B | Spiked Control A | Spiked Control B | Spiked Control A | Spiked Control B | Spiked Control A | Spiked Control B |
| Isobutane | 5.8 | 5.7 | 4.8 | 5.6 | 6.4 | 5.7 | 5.8 | 5.4 |
| N-Butane | 0.3 | 0.3 | 0.0 | 0.2 | 0.3 | 0.3 | 0.3 | 0.2 |
| 2-Methylbutane | 64.1 | 64.1 | 59.0 | 62.3 | 64.8 | 64.4 | 63.5 | 63.3 |
| N-Pentane | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 2.4 | 2.4 | 2.5 | 2.5 | 2.4 | 2.4 | 2.4 | 2.5 |
| Cyclopentane | 5.6 | 5.5 | 5.9 | 5.7 | 5.5 | 5.6 | 5.6 | 5.7 |
| 2-Methylpentane | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| 3-Methylpentane | 0.4 | 0.4 | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 | 0.5 |
| N-Hexane | 0.7 | 0.7 | 0.8 | 0.7 | 0.7 | 0.7 | 0.7 | 0.8 |
| Isobutanol | 2.1 | 2.1 | 2.5 | 2.4 | 2.2 | 2.6 | 2.6 | 2.7 |
| Methylcyclopentane | 0.2 | 0.2 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.2 | 0.2 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.3 |
| 2,3-Dimethylpentane | 0.8 | 0.8 | 0.9 | 0.8 | 0.7 | 0.8 | 0.8 | 0.8 |
| 3-Methylhexane | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2,4-Trimethylpentane | 11.1 | 11.0 | 13.6 | 11.9 | 10.2 | 10.6 | 11.0 | 11.2 |
| 2,3,3-trimethylpentane | 5.4 | 5.6 | 7.2 | 6.1 | 5.1 | 5.3 | 5.5 | 5.6 |

**Table 2 (continued) Spiked control samples**

(Area %)

| Compound | Exposure Days 44/45 | | Exposure Days 49/50 | | Exposure Days 54/55 | | Exposure Days 59/60 | |
|---|---|---|---|---|---|---|---|---|
| | Spiked Control A | Spiked Control B | Spiked Control A | Spiked Control B | Spiked Control A | Spiked Control B | Spiked Control A | Spiked Control B |
| Isobutane | 5.8 | 5.6 | 6.2 | 6.1 | 5.5 | 5.7 | 5.6 | 5.1 |
| N-Butane | 0.3 | 0.2 | 0.3 | 0.3 | 0.2 | 0.3 | 0.3 | 0.2 |
| 2-Methylbutane | 64.6 | 64.7 | 64.8 | 64.5 | 63.8 | 64.0 | 64.3 | 64.2 |
| N-Pentane | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.5 |
| Cyclopentane | 5.6 | 5.6 | 5.5 | 5.5 | 5.6 | 5.6 | 5.6 | 5.7 |
| 2-Methylpentane | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| 3-Methylpentane | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.8 |
| Isobutanol | 2.4 | 2.5 | 2.4 | 2.4 | 2.5 | 2.7 | 2.6 | 2.5 |
| Methylcyclopentane | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.8 | 0.7 | 0.7 | 0.7 | 0.8 | 0.8 | 0.8 | 0.8 |
| 3-Methylhexane | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2,4-Trimethylpentane | 10.5 | 10.5 | 10.2 | 10.3 | 11.1 | 10.8 | 10.8 | 11.0 |
| 2,3,3-trimethylpentane | 5.2 | 5.3 | 5.1 | 5.4 | 5.6 | 5.4 | 5.3 | 5.4 |

**Table 2 (continued) Spiked control samples**

(Area %)

| Compound | Exposure Days 64/65 | | Exposure Days 67/68 | |
|---|---|---|---|---|
| | Spiked Control A | Spiked Control B | Spiked Control A | Spiked Control B |
| Isobutane | 4.9 | 5.5 | 5.6 | 4.7 |
| N-Butane | 0.2 | 0.2 | 0.2 | 0.2 |
| 2-Methylbutane | 63.9 | 64.3 | 63.9 | 62.8 |
| N-Pentane | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 2.5 | 2.4 | 2.4 | 2.5 |
| Cyclopentane | 5.8 | 5.6 | 5.6 | 5.7 |
| 2-Methylpentane | 0.5 | 0.5 | 0.5 | 0.5 |
| 3-Methylpentane | 0.5 | 0.4 | 0.4 | 0.5 |
| N-Hexane | 0.8 | 0.7 | 0.7 | 0.8 |
| Isobutanol | 2.6 | 2.5 | 2.6 | 2.9 |
| Methylcyclopentane | 0.2 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.3 | 0.2 | 0.2 | 0.3 |
| 2,3-Dimethylpentane | 0.8 | 0.8 | 0.8 | 0.8 |
| 3-Methylhexane | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2,4-Trimethylpentane | 11.2 | 10.8 | 10.9 | 11.6 |
| 2,3,3-trimethylpentane | 5.6 | 5.4 | 5.4 | 6.1 |

## Table 3 Chamber components confirmation: Exposure Days 4 and 5

Sequence #: 001

(Area %)

| Compound | Group 1 1001M | Group 1 1001F | Group 2 2001M | Group 2 2001F | Group 3 3001M | Group 3 3001F | Group 4 4001M | Group 4 4001F |
|---|---|---|---|---|---|---|---|---|
| | Exposure Day | | | | | | | |
| | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 4 |
| Isobutane | 11.7[a] | 10.7[a] | 5.9 | 5.7 | 6.9 | 8.5 | 7.7 | 8.4 |
| N-Butane | 0.0 | 0.0 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 80.4[a] | 82.3[a] | 67.0 | 65.3 | 65.6 | 65.9 | 65.8 | 65.8 |
| N-Pentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 0.0 | 2.4 | 2.4 | 2.3 | 2.2 | 2.3 | 2.2 |
| Cyclopentane | 7.3[a] | 7.0[a] | 5.4 | 5.6 | 5.4 | 5.1 | 5.3 | 5.2 |
| 2-Methylpentane | 0.0 | 0.0 | 0.4 | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.0 | 0.7 | 0.7 | 0.7 | 0.6 | 0.7 | 0.6 |
| Isobutanol | 0.0 | 0.0 | 2.5 | 2.4 | 2.4 | 2.3 | 2.3 | 2.1 |
| Methylcyclopentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.0 | 0.7 | 0.7 | 0.7 | 0.6 | 0.7 | 0.6 |
| 3-Methylhexane | 0.0 | 0.0 | 0.2 | 0.2 | 0.0 | 0.0 | 0.2 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 0.0 | 9.1 | 10.2 | 9.5 | 8.7 | 9.1 | 8.8 |
| 2,3,3-trimethylpentane | 0.0 | 0.0 | 4.6 | 5.0 | 4.6 | 4.2 | 4.4 | 4.4 |

[a]Signals assessed to be the result of carry-over. Group 1 deemed devoid of test material.

## Table 4 Chamber components confirmation: Exposure Days 9 and 10

Sequence #: 002

(Area %)

| Compound | Group 1 1002M | Group 1 1002F | Group 2 2002M | Group 2 2002F | Group 3 3002M | Group 3 3002F | Group 4 4002M | Group 4 4002F |
|---|---|---|---|---|---|---|---|---|
| | Exposure Day | | | | | | | |
| | 9 | 9 | 10 | 10 | 10 | 10 | 9 | 9 |
| Isobutane | 10.6[a] | 12.3[a] | 7.4 | 7.6 | 6.8 | 8.8 | 8.2 | 8.0 |
| N-Butane | 0.0 | 0.0 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 81.9[a] | 80.1[a] | 66.5 | 66.7 | 67.8 | 67.9 | 65.8 | 65.6 |
| N-Pentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 0.0 | 2.3 | 2.3 | 2.4 | 2.3 | 2.2 | 2.2 |
| Cyclopentane | 6.8[a] | 7.3[a] | 5.2 | 5.2 | 5.6 | 5.3 | 5.2 | 5.2 |
| 2-Methylpentane | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.0 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 0.0 | 2.3 | 2.2 | 2.1 | 2.0 | 2.3 | 2.3 |
| Methylcyclopentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.0 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 3-Methylhexane | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 |
| 2,2,4-Trimethylpentane | 0.0 | 0.0 | 8.7 | 8.6 | 8.3 | 7.5 | 8.9 | 8.9 |
| 2,3,3-trimethylpentane | 0.0 | 0.0 | 4.4 | 4.2 | 3.8 | 3.3 | 4.3 | 4.6 |

[a]Signals assessed to be the result of carry-over. Group 1 deemed devoid of test material.

## Table 5 Chamber components confirmation: Exposure Days 14 and 15

Sequence #: 003

(Area %)

| Compound | Group 1 1003M | Group 1 1003F | Group 2 2003M | Group 2 2003F | Group 3 3003M | Group 3 3003F | Group 4 4003M | Group 4 4003F |
|---|---|---|---|---|---|---|---|---|
| | Exposure Day | | | | | | | |
| | 14 | 14 | 15 | 15 | 15 | 15 | 14 | 14 |
| Isobutane | 10.1[a] | 10.4[a] | 7.9 | 8.0 | 8.2 | 8.3 | 6.3 | 7.2 |
| N-Butane | 0.0 | 0.0 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 82.4[a] | 82.1[a] | 65.9 | 65.6 | 66.1 | 66.2 | 66.1 | 66.1 |
| N-Pentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 0.0 | 2.3 | 2.3 | 2.2 | 2.2 | 2.3 | 2.3 |
| Cyclopentane | 7.2[a] | 7.1[a] | 5.2 | 5.2 | 5.2 | 5.2 | 5.3 | 5.3 |
| 2-Methylpentane | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.0 | 0.6 | 0.6 | 0.6 | 0.6 | 0.7 | 0.6 |
| Isobutanol | 0.0 | 0.0 | 2.2 | 2.3 | 2.2 | 2.1 | 2.5 | 2.1 |
| Methylcyclopentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.0 | 0.7 | 0.7 | 0.6 | 0.6 | 0.7 | 0.7 |
| 3-Methylhexane | 0.0 | 0.0 | 0.2 | 0.2 | 0.1 | 0.1 | 0.2 | 0.2 |
| 2,2,4-Trimethylpentane | 0.0 | 0.0 | 9.0 | 9.0 | 8.7 | 8.7 | 9.5 | 9.2 |
| 2,3,3-trimethylpentane | 0.0 | 0.0 | 4.3 | 4.4 | 4.4 | 4.2 | 4.9 | 4.7 |

[a]Signals < 2% spiked control signals.

## Table 6 Chamber components confirmation: Exposure Days 19 and 20

Sequence #: 004

(Area %)

| | Group 1 1004M | Group 1 1004F | Group 1 1005M[a] | Group 1 1005F[a] | Group 2 2004M | Group 2 2004F | Group 3 3004M | Group 3 3004F | Group 4 4004M | Group 4 4004F |
|---|---|---|---|---|---|---|---|---|---|---|
| | Exposure Day | | | | | | | | | |
| **Compound** | **19** | **19** | **20** | **20** | **20** | **20** | **20** | **20** | **19** | **19** |
| Isobutane | 10.9[b] | 11.1[b] | 6.4 | 6.4 | 8.7 | 8.5 | 8.0 | 6.1 | 8.5 | 8.4 |
| N-Butane | 0.0 | 0.0 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 81.8[b] | 82.0[b] | 64.1 | 63.9 | 65.9 | 66.2 | 65.9 | 67.3 | 66.5 | 66.1 |
| N-Pentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 0.0 | 2.3 | 2.3 | 2.2 | 2.2 | 2.3 | 2.3 | 2.2 | 2.2 |
| Cyclopentane | 6.8[b] | 6.9[b] | 5.4 | 5.4 | 5.1 | 5.1 | 5.2 | 5.1 | 5.2 | 5.1 |
| 2-Methylpentane | 0.0 | 0.0 | 0.5 | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.0 | 0.7 | 0.7 | 0.6 | 0.6 | 0.6 | 0.7 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 0.0 | 2.6 | 2.6 | 2.1 | 2.2 | 2.2 | 2.4 | 2.1 | 2.1 |
| Methylcyclopentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.0 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.0 | 0.7 | 0.7 | 0.6 | 0.6 | 0.6 | 0.7 | 0.6 | 0.6 |
| 3-Methylhexane | 0.0[c] | 0.0 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.2 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 0.0 | 10.3 | 10.4 | 8.5 | 8.5 | 8.9 | 8.9 | 8.5 | 8.7 |
| 2,3,3-trimethylpentane | 0.0 | 0.0 | 5.4 | 5.5 | 4.3 | 4.2 | 4.4 | 4.6 | 4.1 | 4.2 |

[a]Samples taken at the request of the Study Director.
[b]Signals about 2% of spiked control signals.
[c]Peak determined to be baseline noise.

## Table 7 Chamber components confirmation: Exposure Day 24 and 25

Sequence #: 005

(Area %)

| Compound | Group 1 1006M | Group 1 1006F | 804 Back Room Air | 805 Back Room Air | Group 2 2005M | Group 2 2005F | Group 3 3005M | Group 3 3005F | Group 4 4005M | Group 4 4005F |
|---|---|---|---|---|---|---|---|---|---|---|
| | Exposure Day | | | | | | | | | |
| | 24 | 24 | 25 | 25 | 25 | 25 | 25 | 25 | 24 | 24 |
| Isobutane | 10.4[a] | 10.6[a] | 10.8[a] | 12.9[a] | 7.2 | 6.8 | 8.4 | 8.4 | 8.2 | 8.2 |
| N-Butane | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 82.5[a] | 82.4[a] | 82.3[a] | 79.8[a] | 66.5 | 66.2 | 66.2 | 65.8 | 66.0 | 66.1 |
| N-Pentane | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 0.0 | 0.0 | 0.0 | 2.3 | 2.3 | 2.2 | 2.2 | 2.2 | 2.2 |
| Cyclopentane | 7.1[a] | 6.9[a] | 6.7[a] | 7.3[a] | 5.2 | 5.2 | 5.2 | 5.1 | 5.1 | 5.2 |
| 2-Methylpentane | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 0.0 | 0.0 | 0.0 | 2.3 | 2.4 | 2.1 | 2.1 | 2.2 | 2.1 |
| Methylcyclopentane | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.7 | 0.6 | 0.6 | 0.6 | 0.6 |
| 3-Methylhexane | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 0.0 | 0.0 | 0.0 | 8.8 | 9.1 | 8.7 | 8.7 | 8.7 | 8.7 |
| 2,3,3-trimethylpentane | 0.0 | 0.0 | 0.0 | 0.0 | 4.4 | 4.6 | 4.1 | 4.4 | 4.4 | 4.4 |

[a]Signals ~ 2% of spiked control signals

## Table 8 Chamber components confirmation: Exposure Day 29 and 30

Sequence #: 006

(Area %)

| Compound | Group 1 1007M | Group 1 1007F | Group 2 2006M | Group 2 2006F | Group 3 3006M | Group 3 3006F | Group 4 4006M | Group 4 4006F |
|---|---|---|---|---|---|---|---|---|
| | Exposure Day | | | | | | | |
| | 29 | 29 | 30 | 30 | 30 | 30 | 29 | 29 |
| Isobutane | 10.1[a] | 10.3[a] | 6.4 | 6.0 | 5.6 | 5.1 | 8.4 | 8.9 |
| N-Butane | 0.0 | 0.0 | 0.3 | 0.3 | 0.2 | 0.2 | 0.3 | 0.3 |
| 2-Methylbutane | 82.6[a] | 82.9[a] | 68.1 | 66.6 | 64.0 | 65.6 | 73.1 | 70.8 |
| N-Pentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 0.0 | 2.5 | 2.5 | 2.4 | 2.5 | 2.3 | 2.0 |
| Cyclopentane | 7.4 | 6.8[a] | 5.8 | 5.7 | 5.7 | 5.9 | 6.1 | 5.8 |
| 2-Methylpentane | 0.0 | 0.0 | 0.5 | 0.5 | 0.5 | 0.5 | 0.4 | 0.3 |
| 3-Methylpentane | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 | 0.4 | 0.3 | 0.3 |
| N-Hexane | 0.0 | 0.0 | 0.7 | 0.7 | 0.7 | 0.7 | 0.4 | 0.4 |
| Isobutanol | 0.0 | 0.0 | 2.1 | 1.9 | 2.3 | 2.4 | 1.5 | 1.5 |
| Methylcyclopentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.0 | 0.0 |
| 2,3-Dimethylpentane | 0.0 | 0.0 | 0.6 | 0.7 | 0.8 | 0.7 | 0.4 | 0.4 |
| 3-Methylhexane | 0.0 | 0.0 | 0.1 | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 0.0 | 8.1 | 9.4 | 10.7 | 10.2 | 4.4 | 5.7 |
| 2,3,3-trimethylpentane | 0.0 | 0.0 | 3.6 | 4.5 | 5.7 | 4.9 | 1.9 | 3.0 |

[a]Signals about 2% of spiked control signals

## Table 9 Chamber components confirmation: Exposure Day 34 and 35

Sequence #: 007

(Area %)

| Compound | Group 1 1008M | Group 1 1008F | Group 2 2007M | Group 2 2007F | Group 3 3007M | Group 3 3007F | Group 4 4007M | Group 4 4007F |
|---|---|---|---|---|---|---|---|---|
| | Exposure Day | | | | | | | |
| | 34 | 34 | 35 | 35 | 35 | 35 | 34 | 34 |
| Isobutane | 0.0 | 0.0 | 6.4 | 6.9 | 6.2 | 5.8 | 8.0 | 8.7 |
| N-Butane | 0.0 | 0.0 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 100.0[a] | 0.0 | 66.5 | 66.2 | 66.4 | 66.2 | 66.0 | 66.2 |
| N-Pentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 0.0 | 2.3 | 2.3 | 2.4 | 2.4 | 2.2 | 2.2 |
| Cyclopentane | 0.0 | 0.0 | 5.3 | 5.4 | 5.5 | 5.6 | 5.2 | 5.1 |
| 2-Methylpentane | 0.0 | 0.0 | 0.4 | 0.5 | 0.5 | 0.5 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.0 | 0.7 | 0.7 | 0.7 | 0.7 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 0.0 | 2.4 | 1.9 | 2.4 | 2.5 | 2.1 | 2.1 |
| Methylcyclopentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.0 | 0.2 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.0 | 0.7 | 0.7 | 0.7 | 0.7 | 0.6 | 0.6 |
| 3-Methylhexane | 0.5 | 0.0 | 0.2 | 0.1 | 0.1 | 0.2 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 0.0 | 9.2 | 9.5 | 9.3 | 9.5 | 8.9 | 8.5 |
| 2,3,3-trimethylpentane | 0.0 | 0.0 | 4.7 | 4.7 | 4.6 | 4.7 | 4.4 | 4.1 |

[a]Signals about 2% of spiked control signals

## Table 10 Chamber components confirmation: Exposure Day 39 and 40

Sequence #: 008

(Area %)

| Compound | Group 1 1009M | Group 1 1009F | Group 2 2008M | Group 2 2008F | Group 3 3008M | Group 3 3008F | Group 4 4008M | Group 4 4008F |
|---|---|---|---|---|---|---|---|---|
| | Exposure Day | | | | | | | |
| | 39 | 39 | 40 | 40 | 40 | 40 | 39 | 39 |
| Isobutane | 0.0 | 0.0 | 8.1 | 7.5 | 8.2 | 8.7 | 8.4 | 8.7 |
| N-Butane | 0.0 | 0.0 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 0.0 | 0.0 | 66.0 | 66.3 | 66.0 | 66.0 | 66.0 | 65.7 |
| N-Pentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 0.0 | 2.3 | 2.3 | 2.2 | 2.2 | 2.2 | 2.2 |
| Cyclopentane | 0.0 | 0.0 | 5.2 | 5.2 | 5.2 | 5.1 | 5.1 | 5.1 |
| 2-Methylpentane | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.0 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 0.0 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 |
| Methylcyclopentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.0 | 0.7 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 3-Methylhexane | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 0.0 | 8.9 | 8.9 | 8.7 | 8.6 | 8.6 | 8.6 |
| 2,3,3-trimethylpentane | 0.0 | 0.0 | 4.4 | 4.6 | 4.3 | 4.2 | 4.3 | 4.4 |

## Table 11 Chamber components confirmation: Exposure Day 44 and 45

Sequence #: 009

(Area %)

| Compound | Group 1 1010M | Group 1 1010F | Group 2 2009M | Group 2 2009F | Group 3 3009M | Group 3 3009F | Group 4 4009M | Group 4 4009F |
|---|---|---|---|---|---|---|---|---|
| | Exposure Day | | | | | | | |
| | 44 | 44 | 45 | 45 | 45 | 45 | 44 | 44 |
| Isobutane | 0.0 | 0.0 | 6.5 | 7.4 | 8.6 | 8.0 | 6.6 | 7.8 |
| N-Butane | 0.0 | 0.0 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 0.0 | 0.0 | 65.7 | 65.7 | 65.7 | 66.0 | 65.8 | 72.1 |
| N-Pentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 0.0 | 2.3 | 2.3 | 2.2 | 2.2 | 2.3 | 2.3 |
| Cyclopentane | 0.0 | 0.0 | 5.4 | 5.3 | 5.1 | 5.2 | 5.5 | 5.8 |
| 2-Methylpentane | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.0 | 0.7 | 0.6 | 0.6 | 0.6 | 0.7 | 0.5 |
| Isobutanol | 0.0 | 0.0 | 2.6 | 2.4 | 2.3 | 2.3 | 2.2 | 1.7 |
| Methylcyclopentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.0 |
| 2,3-Dimethylpentane | 0.0 | 0.0 | 0.7 | 0.7 | 0.6 | 0.6 | 0.7 | 0.4 |
| 3-Methylhexane | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 0.0 | 9.4 | 9.0 | 8.6 | 8.8 | 9.6 | 5.5 |
| 2,3,3-trimethylpentane | 0.0 | 0.0 | 4.8 | 4.7 | 4.5 | 4.3 | 4.7 | 2.2 |

## Table 12 Chamber components confirmation: Exposure Day 49 and 50

Sequence #: 010

(Area %)

| Compound | Group 1 1011M | Group 1 1011F | Group 2 2010M | Group 2 2010F | Group 3 3010M | Group 3 3010F | Group 4 4010M | Group 4 4010F |
|---|---|---|---|---|---|---|---|---|
| | Exposure Day | | | | | | | |
| | 49 | 49 | 50 | 50 | 50 | 50 | 49 | 49 |
| Isobutane | 0.0 | 0.0 | 6.0 | 6.8 | 7.0 | 7.2 | 6.1 | 7.8 |
| N-Butane | 0.0 | 0.0 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 100.0[a] | 100.0[a] | 66.0 | 66.2 | 66.6 | 65.7 | 65.4 | 66.2 |
| N-Pentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 0.0 | 2.3 | 2.3 | 2.3 | 2.3 | 2.4 | 2.3 |
| Cyclopentane | 0.0 | 0.0 | 5.4 | 5.5 | 5.5 | 5.4 | 5.5 | 5.3 |
| 2-Methylpentane | 0.0 | 0.0 | 0.4 | 0.5 | 0.4 | 0.4 | 0.5 | 0.4 |
| 3-Methylpentane | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.0 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.6 |
| Isobutanol | 0.0 | 0.0 | 2.6 | 2.6 | 2.3 | 2.4 | 2.5 | 2.2 |
| Methylcyclopentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.0 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.6 |
| 3-Methylhexane | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 0.0 | 9.4 | 9.0 | 8.9 | 9.2 | 9.7 | 8.8 |
| 2,3,3-trimethylpentane | 0.0 | 0.0 | 4.9 | 4.4 | 4.2 | 4.5 | 5.0 | 4.3 |

[a]Signals about 2% of spiked control signals

## Table 13 Chamber components confirmation: Exposure Day 54 and 55

Sequence #: 011

(Area %)

| Compound | Group 1 1012M | Group 1 1012F | Group 2 2011M | Group 2 2011F | Group 3 3011M | Group 3 3011F | Group 4 4011M | Group 4 4011F |
|---|---|---|---|---|---|---|---|---|
| | Exposure Day | | | | | | | |
| | 54 | 54 | 55 | 55 | 55 | 55 | 54 | 54 |
| Isobutane | 0.0 | 0.0 | 8.2 | 8.0 | 9.0 | 8.8 | 7.3 | 7.7 |
| N-Butane | 0.0 | 0.0 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 0.0 | 0.0 | 66.9 | 66.3 | 69.3 | 68.7 | 66.6 | 69.9 |
| N-Pentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 0.0 | 2.3 | 2.3 | 2.2 | 2.3 | 2.3 | 2.4 |
| Cyclopentane | 0.0 | 0.0 | 5.3 | 5.2 | 5.4 | 5.4 | 5.3 | 5.5 |
| 2-Methylpentane | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.0 | 0.6 | 0.6 | 0.6 | 0.6 | 0.7 | 0.6 |
| Isobutanol | 0.0 | 0.0 | 2.2 | 2.3 | 2.0 | 2.1 | 2.2 | 2.2 |
| Methylcyclopentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.0 | 0.6 | 0.6 | 0.5 | 0.5 | 0.6 | 0.5 |
| 3-Methylhexane | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 0.0 | 8.2 | 8.7 | 6.5 | 7.0 | 8.8 | 6.4 |
| 2,3,3-trimethylpentane | 0.0 | 0.0 | 3.8 | 4.2 | 2.8 | 3.0 | 4.2 | 2.9 |

## Table 14 Chamber components confirmation: Exposure Day 59 and 60

Sequence #: 013

(Area %)

| Compound | Group 1 1013M | Group 1 1013F | Group 2 2012M | Group 2 2012F | Group 3 3012M | Group 3 3012F | Group 4 4012M | Group 4 4012F |
|---|---|---|---|---|---|---|---|---|
| | Exposure Day | | | | | | | |
| | 59 | 59 | 60 | 60 | 60 | 60 | 59 | 59 |
| Isobutane | 0.0 | 0.0 | 7.7 | 7.7 | 8.9 | 8.6 | 8.6 | 8.7 |
| N-Butane | 0.0 | 0.0 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 0.0 | 0.0 | 66.1 | 66.2 | 68.6 | 67.3 | 66.2 | 66.3 |
| N-Pentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 0.0 | 2.3 | 2.3 | 2.3 | 2.2 | 2.2 | 2.2 |
| Cyclopentane | 0.0 | 0.0 | 5.2 | 5.2 | 5.3 | 5.1 | 5.1 | 5.1 |
| 2-Methylpentane | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.0 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 0.0 | 2.1 | 2.1 | 1.9 | 2.0 | 2.2 | 2.2 |
| Methylcyclopentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.0 | 0.7 | 0.7 | 0.6 | 0.6 | 0.6 | 0.6 |
| 3-Methylhexane | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 0.0 | 9.1 | 9.0 | 7.1 | 8.0 | 8.5 | 8.4 |
| 2,3,3-trimethylpentane | 0.0 | 0.0 | 4.4 | 4.4 | 3.1 | 3.7 | 4.1 | 4.1 |

## Table 15 Chamber components confirmation: Exposure Day 64 and 65

Sequence #: 014

(Area %)

| Compound | Group 1 1014M | Group 1 1014F | Group 2 2013M | Group 2 2013F | Group 3 3013M | Group 3 3013F | Group 4 4013M | Group 4 4013F |
|---|---|---|---|---|---|---|---|---|
| | Exposure Day | | | | | | | |
| | 64 | 64 | 65 | 65 | 65 | 65 | 64 | 64 |
| Isobutane | 0.0 | 0.0 | 8.6 | 7.5 | 8.3 | 8.5 | 8.3 | 8.5 |
| N-Butane | 0.0 | 0.0 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 100.0[a] | 100.0[a] | 69.8 | 66.0 | 67.0 | 66.9 | 66.8 | 66.2 |
| N-Pentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 0.0 | 2.4 | 2.3 | 2.3 | 2.3 | 2.2 | 2.2 |
| Cyclopentane | 0.0 | 0.0 | 5.5 | 5.2 | 5.2 | 5.1 | 5.2 | 5.1 |
| 2-Methylpentane | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.0 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 0.0 | 2.4 | 2.5 | 2.1 | 2.1 | 2.3 | 2.3 |
| Methylcyclopentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.0 | 0.5 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 3-Methylhexane | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 0.0 | 5.9 | 8.9 | 8.2 | 8.1 | 8.2 | 8.5 |
| 2,3,3-trimethylpentane | 0.0 | 0.0 | 2.5 | 4.4 | 3.9 | 3.9 | 3.9 | 4.1 |

[a]Signals <3% spiked controls

## Table 16 Chamber components confirmation: Exposure Day 67 and 68

Sequence #: 015

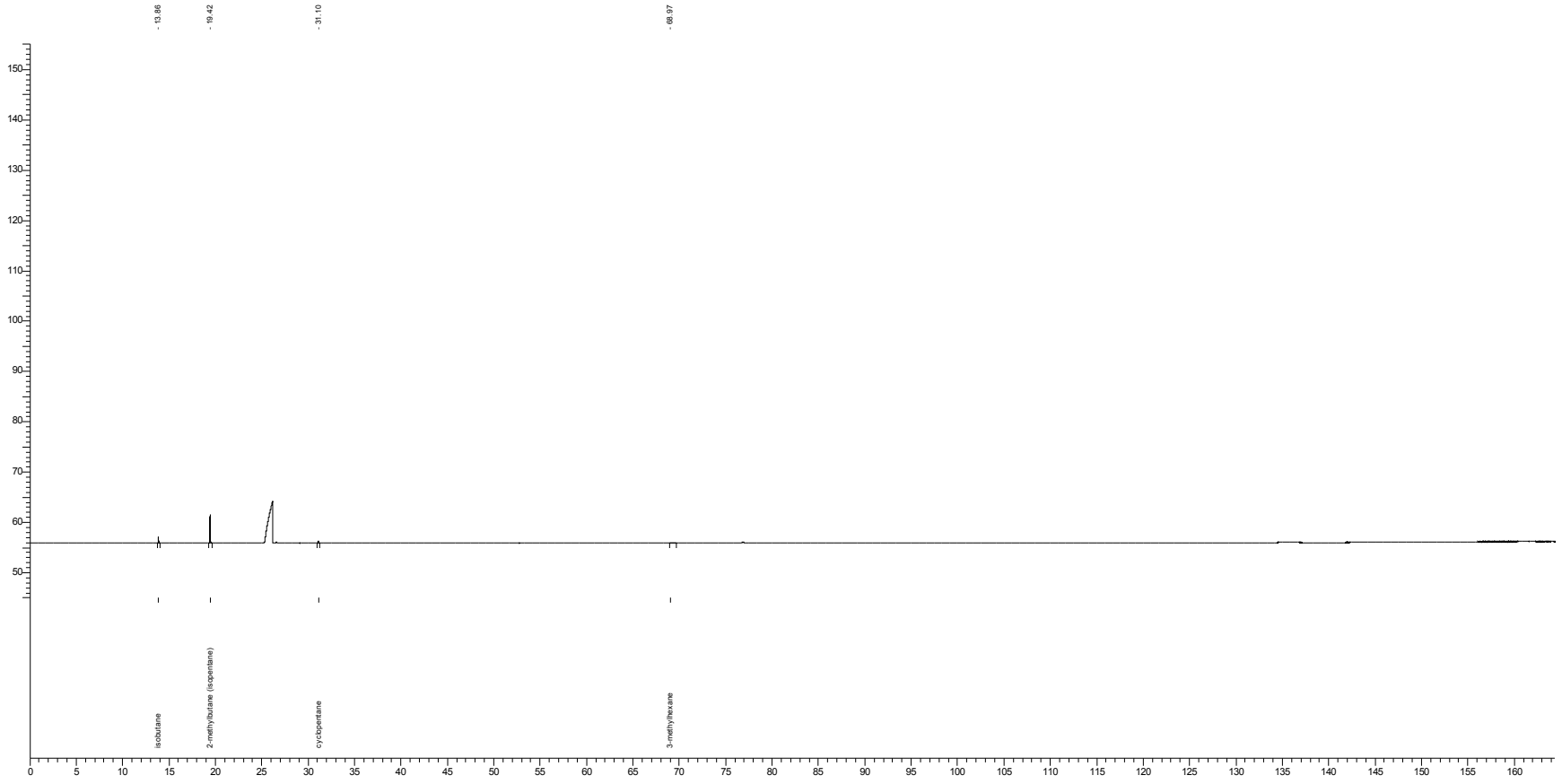
(Area %)

| Compound | Group 1 1015M | Group 1 1015F | Group 2 2014M | Group 2 2014F | Group 3 3014M | Group 3 3014F | Group 4 4014M | Group 4 4014F |
|---|---|---|---|---|---|---|---|---|
| | Exposure Day | | | | | | | |
| | 67 | 67 | 68 | 68 | 68 | 68 | 67 | 67 |
| Isobutane | 0.0 | 0.0 | 7.6 | 7.7 | 8.4 | 8.3 | 7.5 | 6.6 |
| N-Butane | 0.0 | 0.0 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 94.4[a] | 100.0[a] | 65.8 | 65.9 | 68.7 | 67.0 | 66.9 | 66.1 |
| N-Pentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 0.0 | 2.3 | 2.3 | 2.3 | 2.2 | 2.3 | 2.3 |
| Cyclopentane | 0.0 | 0.0 | 5.3 | 5.3 | 5.4 | 5.2 | 5.4 | 5.5 |
| 2-Methylpentane | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.0 | 0.7 | 0.6 | 0.6 | 0.6 | 0.6 | 0.7 |
| Isobutanol | 0.0 | 0.0 | 2.2 | 2.2 | 1.9 | 2.0 | 2.2 | 2.3 |
| Methylcyclopentane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.0 | 0.7 | 0.7 | 0.5 | 0.6 | 0.6 | 0.7 |
| 3-Methylhexane | 5.6 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 |
| 2,2,4-Trimethylpentane | 0.0 | 0.0 | 9.1 | 9.0 | 7.1 | 8.2 | 8.5 | 9.2 |
| 2,3,3-trimethylpentane | 0.0 | 0.0 | 4.5 | 4.4 | 3.3 | 3.9 | 4.1 | 4.7 |

[a]Signals < 1% of spiked control signals

## Figure 1 Typical GC chromatogram of Group 1 Charcoal tube (0 mg/m$^3$)

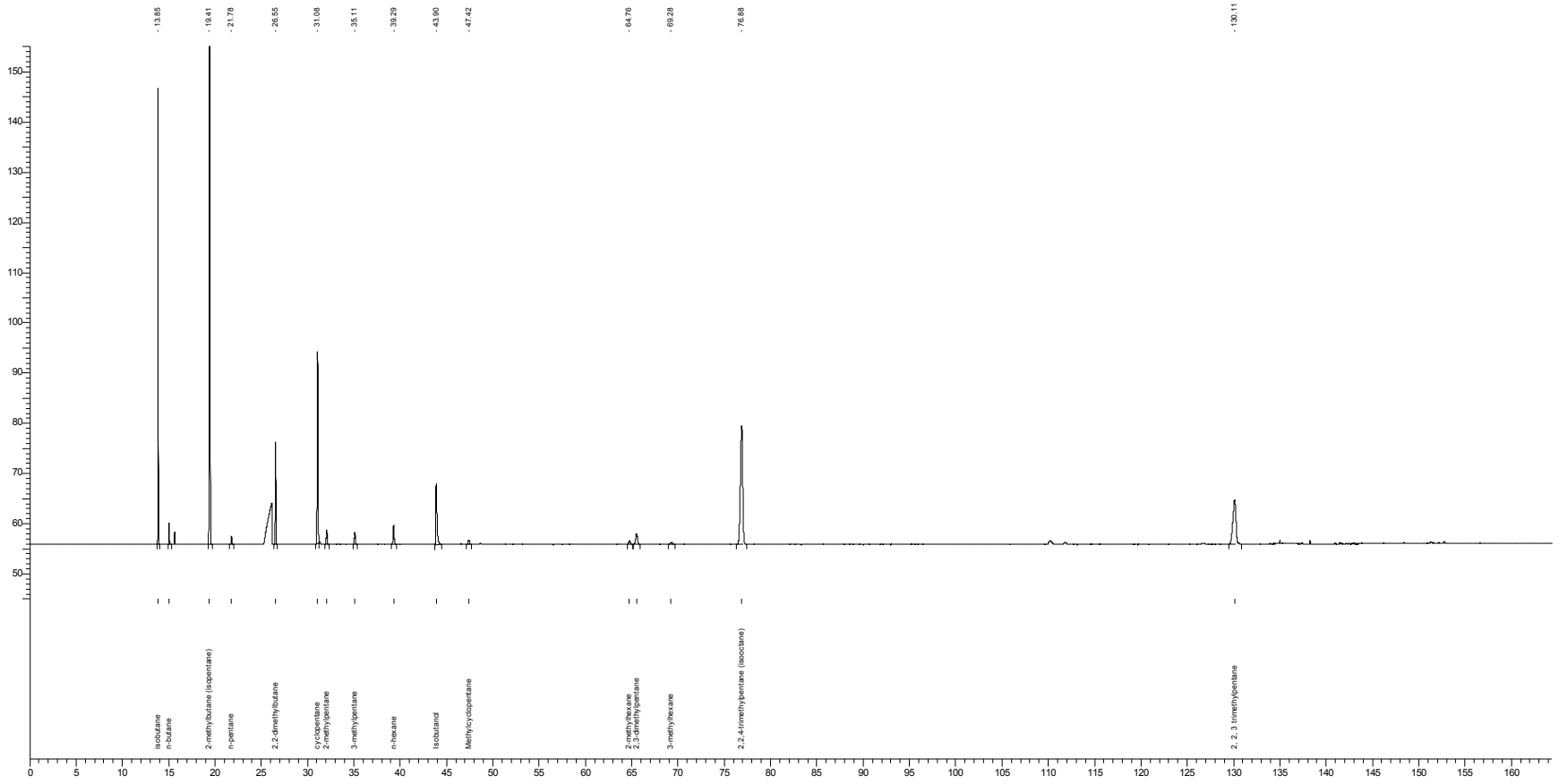
(File Name #: 001_010.rst, 14-6485)




**Response (mV) vs. Time (min.)**

**Figure 2 Typical GC chromatogram of Group 2 Charcoal tube (2000 mg/m$^3$)**

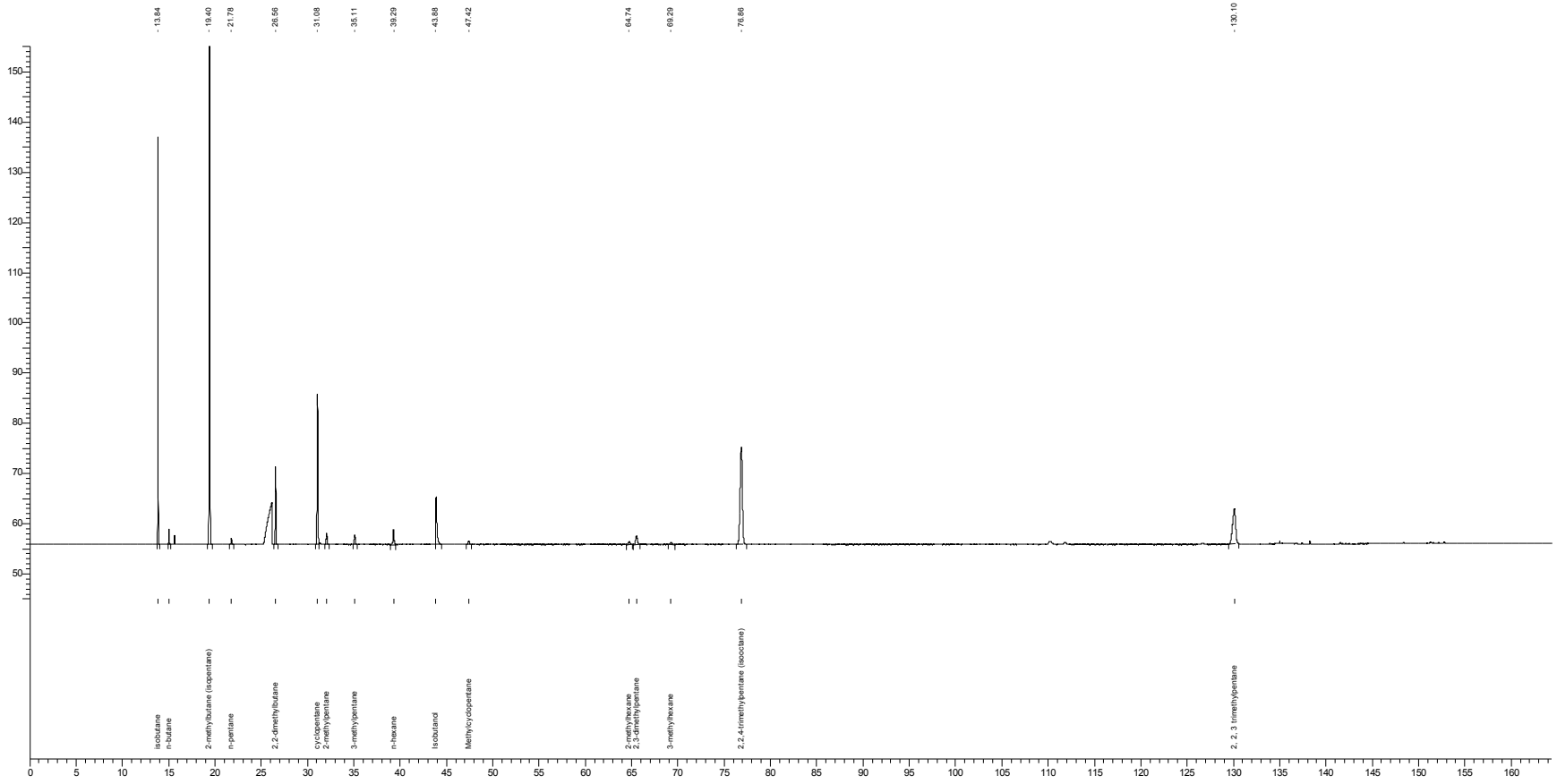
(File Name #: 001_014.rst, 14-6485)




**Response (mV) vs. Time (min.)**

## Figure 3 Typical GC chromatogram of Group 3 Charcoal tube (10000 mg/m$^3$)

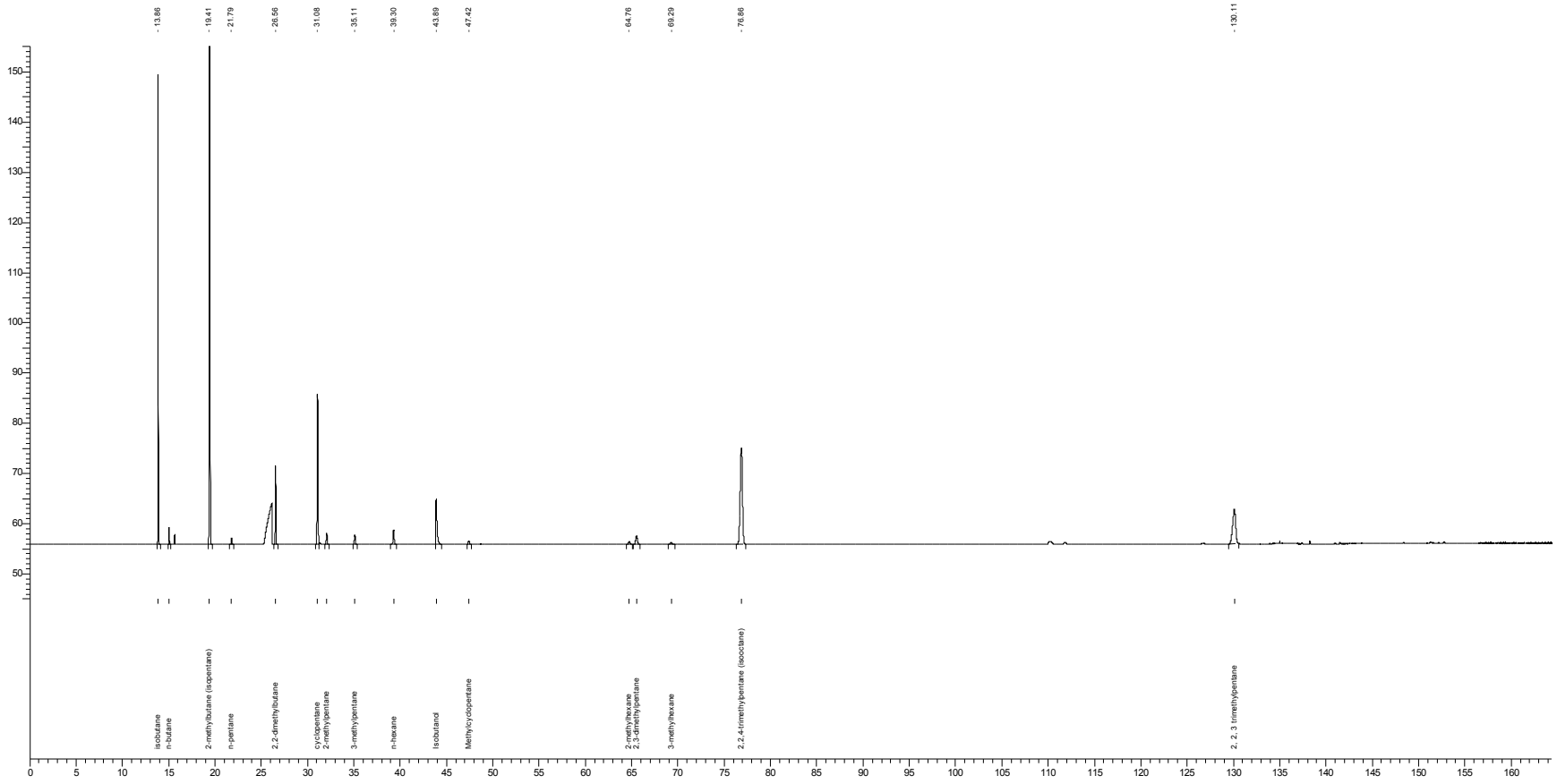
(File Name #: 001_016.rst, 14-6485)




**Response (mV) vs. Time (min.)**

## Figure 4 Typical GC chromatogram of Group 4 Charcoal tube (20000 mg/m$^3$)

(File Name #: 001_012.rst, 14-6485)




**Response (mV) vs. Time (min.)**

# Annex 3 Inhalation technology report

# Inhalation Technology Report

On 21 September 2015 the legal entity Huntingdon Life Sciences, Inc. was renamed as Envigo CRS, Inc. No other changes to the legal entity have occurred.

| | |
|---|---|
| **Envigo study number:** | 14-6485 |
| **Version:** | Final |
| **Issue Date:** | 23 March 2016 |

# SIGNATURE PAGE

The following scientist was responsible for this portion of the study:

[redacted]

Justine Damiano, BS
Divisional Manager/Aerosol Technologist
Inhalation Toxicology

23 Mar 16
Date

# 1. Pre-study Atmosphere Characterization

Inhalation exposure system characterized including determinations of:

- Achieved concentration
- Homogeneity of test substance distribution in the chamber

# 2. Test Substance Handling and Processing for Atmosphere Generation

As supplied, Gasoline Isobutanol Vapor Condensate (GIVC) provided in small #33 cylinders and large 100 gallon bulk supply #420 cylinders.

- GIVC metered directly from small Sponsor cylinder as a liquid for daily use
- Small Sponsor cylinders re-filled from large bulk supply cylinders as needed throughout study

# 3. Exposure System

A schematic of the exposure system is presented in Figures 1 and 2. Components of the exposure system included:

- Whole-body exposure chambers:
    - All Groups – 1000 L internal volume
    - Two exposure chambers for each group:
        - Group 1 – chamber identification 101M and 102F
        - Group 2 – chamber identification 201M and 202F
        - Group 3 – chamber identification 301M and 302F
        - Group 4 – chamber identification 401M and 402F
- Animal Restraint:
    - Individually in whole-body restraint cages
- Atmosphere Generation System:
    - Sponsor cylinders assigned to test groups as follows:
        - Group 2:
            - Single Sponsor cylinder per each chamber (Days 1 to 6)
            - Single Sponsor cylinder shared for both chambers (Days 7 to 68)
        - Group 3:
            - Single Sponsor cylinder per each chamber (Days 1 to 10)
            - Single Sponsor cylinder shared for both chambers (Days 11 to 68)
        - Group 4:
            - Single Sponsor cylinder per each chamber (Days 1 to 68)

  - Test substance vaporized by metering liquid from cylinders to a counter current glass volatilization vessel incorporating a heated glass helix
  - Test substance metering rate monitored continuously using in-line liquid flowmeters
  - Test substance vaporized into a low flow of nitrogen directed from the base of the chamber over the helix
  - Nitrogen gas flow monitored continuously using in-line gas flowmeters
  - Nitrogen purge flow over heating elements employed to minimize corrosion of nichrome heating wire
  - Vaporization temperature monitored continuously and adjusted as needed to maintain temperature in the range 20 to 40°C
  - Test substance vapor and nitrogen flow directed into the inlet of the 1000 L whole-body chamber
  - Test substance liquid flow adjusted as required based on Infrared Absorption Determination of the delivered test substance concentrations
  - Room air and nitrogen flow only delivered to Group 1 chambers
- Extract Airflow:
  - Drawn by in-house extract system
  - Drawn from base of exposure system
  - Filtered locally through a charcoal bed before discharge
  - Flow – individually calibrated to a minimum target of 200 L/minute:
    - Group 1 – 101M (219 L/minute), 102F (205 L/minute)
    - Group 2 – 201M (209 L/minute), 202F (209 L/minute)
    - Group 3 – 301M (212 L/minute), 302F (207 L/minute)
    - Group 4 – 401M (237 L/minute), 402F (217 L/minute)
- Airflow Monitoring:
  - Nitrogen flowmeters:
    - set to approximately 15 L/min for counter current flow
    - set to approximately 2 L/min purge flow
    - monitored continuously during exposures
  - Magnehelic gauges for chamber airflow and differential exposure system pressure:
    - calibrated before study start
    - monitored continuously during exposures
    - recorded at 30 minute intervals

# 4. Administration

Exposure concentrations achieved by varying test substance flow rate.

Daily Procedure:

- Miran Infra-Red gas spectrophotometer calibration check performed
- Extract airflow run continuously
- Rats loaded into designated exposure chamber
- Nitrogen and test substance flows initiated
- Sponsor cylinder flows (Groups 2 to 4) established
- Animals exposed for 6 hours
- Exposure system operational parameters monitored continuously
- Chamber temperature, humidity, airflow rate and static pressure documented at approximately 30 minute intervals throughout exposure
- Chamber oxygen concentrations and exposure room environment conditions confirmed pretest and at the beginning, middle and end of study
- Generation terminated – test substance cylinders and nitrogen switched off
- Animals remained in chambers for minimum $T_{99}$ system clear out period
- Animals returned to home cage at end of exposure
- Animals exposed in the same chamber throughout the study

# 5. Atmosphere Analysis

## 5.1 Concentration

The atmosphere concentration was determined as follows:

- Atmosphere analysis - IR spectrophotometer
- Instrument and conditions - Wilks Miran 1A-CVF ambient air analyzer:
  - Wavelength – 9.6 µm (Groups 1 to 4)
  - Pathlength – 2.86 dial setting (Groups 1 to 4)
- Measurement frequency:
  - minimum of 4 samples/group/exposure
  - room air environmental monitoring pretest and at the beginning, middle and end of study
- Sample position remained constant - H1 for chamber concentration (See Figure 1 and 2); exposure room for room air

## 5.2 Test Substance Characterization

The test substance atmosphere was characterized for at least 10 major components as follows:

- Atmosphere analysis – gas chromatography
  - Refer to Formulation and Inhalation Analysis Department Analytical Report 14-6485 for method details and results
- Sample media – charcoal tube (Supelco Orbo-32 Large)
- Sample flow rate – 0.75 L/min

- Sample duration:
  - 40 minutes (Groups 1 and 2)
  - 8 minutes (Group 3)
  - 4 minutes (Group 4)
- Frequency - minimum of 1 sample/chamber pre-test and per week of exposure
- Sample position remained constant (H1)

## 5.3 Particle Size Analysis

Performed to demonstrate the absence of any condensation aerosol as follows:

- Atmosphere analysis – TSI Aerodynamic Particle Sizer
- Qualified pre-study to determine presence or absence of aerosol
- Frequency - minimum of 1 sample/chamber and room environment/week of exposure
- Sample position remained constant (H1)

## 5.4 Chamber Temperature and Relative Humidity

Monitored using Extech Humidity and Thermometer gauges as follows:

- Frequency – continuous monitoring; documented every 30 minutes
- Sample location – gauges located inside the exposure chamber
- Sample position remained constant

## 5.5 Static Pressure and Chamber Airflow

Monitored using Dwyer Magnehelic gauges as follows:

- Frequency – continuous monitoring; documented every 30 minutes;
- Sample location – gauges located outside the exposure chamber

## 5.6 Chamber Oxygen Levels

Chamber oxygen samples collected as follows:

- Sample media – ServoFlex MiniMP (5200) Gas Analyzer
- Sample frequency – confirmed pretest and at the beginning, middle and end of study
- Sample position remained constant (H1)

## 5.7 Exposure Room Environment

- Air sample – collected from exposure room in vapor generation area
  - Atmosphere analysis - IR spectrophotometer
  - Sample frequency – confirmed pretest and at the beginning, middle and end of study
- Light – collected from exposure room
  - Instrumentation – Quantum Instruments Photo-Meter 1
  - Maintained at approximately 30 to 40 foot-candles

  - measured at 1.0 meter above floor
  - Sample frequency – confirmed pretest and at the beginning, middle and end of study
- Sound – collected from exposure room
  - Instrumentation – SPER Scientific Digital Sound Level Meter (840029)
  - Maintained below 85 decibels
  - Sample frequency – confirmed pretest and at the beginning, middle and end of study
- Room environmental monitoring evaluated at both the front and back of the exposure laboratory

### 5.8 Nominal Concentration

Calculated daily for each test substance exposure chamber.

## 6. Data, Abbreviations and Calculations

Data not presented here is retained in the study raw data.

To minimize cumulative errors from repeated rounding of numbers, data in this report has been calculated continuously using unrounded numbers and only rounded for printing. Consequently, presented data may include rounding errors in the last significant figure.

### 6.1 Abbreviations

| | | |
|---|---|---|
| A | = | Airflow |
| C | = | Celsius |
| Conc. | = | Mean atmosphere concentration ($mg/m^3$) |
| D | = | Duration of exposure |
| E | = | Exposure |
| IR | = | Infrared |
| L | = | Liter |
| Min | = | Minute |
| SD | = | Standard Deviation |
| Wt | = | Weight |

## 6.2 Calculations

The IR spectrophotometer was calibrated using test substance directly from the Sponsor cylinder. Absorbance measurements acquired by the IR spectrophotometer were used to calculate analyzed concentration (mg/m$^3$) using a 3$^{rd}$ order fit subjected to least squares regression analysis.

$$\text{Nominal Conc. (mg/m}^3\text{)} = \frac{\text{wt (g)}}{\text{A}\left(\frac{\text{L}}{\text{min}}\right)\text{x D(min)}} \text{ X } \frac{1000\text{ mg}}{1\text{ g}} \text{X} \frac{1000\text{ L}}{1\text{ m3}}$$

# 7. Results and Discussion

Results are presented in Tables 1 to 7 of this report.

## 7.1 Atmosphere Concentration

Overall mean atmosphere and nominal concentrations are presented in Tables 1and 2 and summarized below:

| Group | Atmosphere Concentration (mg/m$^3$) | | | Nominal Concentration (mg/m$^3$) | |
|---|---|---|---|---|---|
| | Target | Achieved | | Achieved | |
| | | Chamber X01M[a] | Chamber X02F[a] | Chamber X01M[a] | Chamber X02F[a] |
| 1 | 0 | 0 | 0 | - | - |
| 2 | 2000 | 2022 | 2106 | 2485[b] | 2485[b] |
| 3 | 10000 | 10290 | 10380 | 12670[b] | 12670[b] |
| 4 | 20000 | 20970 | 20640 | 21750 | 22150 |

[a] X corresponds to chamber Group Identification.

[b] Nominal presented represents Exposure Days where a single cylinder was shared between two chambers.

No GIVC was detected in any of the Group 1 samples.

Mean atmosphere concentrations were 1.1% and 5.3% above target for Group 2 chambers 201M and 202F, respectively.

Mean atmosphere concentrations were 2.9% and 3.8% above target for Group 3 chambers 301M and chamber 302F, respectively.

Mean atmosphere concentrations were 4.9% and 3.2% above target for Group 4 chambers 401M and chamber 402F, respectively.

In order to improve the precision of nominal concentration determinations, on Day 7 the Group 2 test substance delivery was modified such that a single cylinder was used to supply the liquid feed to both the Group 2 chambers. On Day 11, the Group 3 test substance delivery was similarly altered.

For Group 2, the mean atmosphere concentration for chambers 201M and 202F for Days 7 to 68 was 2065 mg/m$^3$ which was 17% lower than the mean nominal concentration of 2485 mg/m$^3$.

For Group 3, the mean atmosphere concentration for chambers 301M and 302F for Days 11 to 68 was 10330 mg/m$^3$ which was 18% lower than the mean nominal concentration of 12670 mg/m$^3$.

For Group 4 for Days 1 to 68, the mean atmosphere concentrations for chambers 401M and 402F were 3.6% and 6.8% lower than the mean nominal concentrations.

The differences between the nominal and measured concentrations for Groups 2 and 3 may be attributed to the limited sensitivity of the balance used and small volume of test substance dispensed during exposure.

These values were all considered a reasonable experimental difference as seen previously at this laboratory.

## 7.2 Chamber Temperature and Relative Humidity

Overall mean chamber temperature is presented in Table 3 and summarised below:

| Temperature (°C) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Group 1 | | Group 2 | | Group 3 | | Group 4 | |
| 101M | 102F | 201M | 202F | 301M | 302F | 401M | 402F |
| 22 | 22 | 22 | 21 | 21 | 21 | 22 | 22 |

Overall mean chamber relative humidity data is presented in Table 4 and summarised below:

| Relative Humidity (%) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Group 1 | | Group 2 | | Group 3 | | Group 4 | |
| 101M | 102F | 201M | 202F | 301M | 302F | 401M | 402F |
| 51 | 48 | 47 | 46 | 47 | 48 | 45 | 46 |

Temperature and humidity remained within protocol specifications and was consistent among all groups.

## 7.3 Particle Size

Particle size analysis confirmed the absence of condensation aerosol in all groups during pretest evaluations and every occasion of assessment during the study (Table 5).

## 7.4 Chamber Oxygen

Individual and overall mean chamber oxygen levels are presented in Table 6. Overall on-test mean exposure values are summarised below:

| Oxygen (%) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Group 1 | | Group 2 | | Group 3 | | Group 4 | |
| 101M | 102F | 201M | 202F | 301M | 302F | 401M | 402F |
| 19.4 | 19.2 | 19.1 | 19.1 | 19.3 | 19.2 | 19.2 | 19.0 |

Oxygen levels during animal exposure met protocol requirements of 19% or higher.

## 7.5 Room Environment

Individual (beginning, middle and end of study) and overall mean room air values, light and sound monitoring are presented in Table 7.

Air samples collected from the exposure room (front and back) confirmed the absence of GIVC.

Overall mean light reading for the front room was 38 foot candles with values ranging from 37 to 38 foot candles.

Overall mean light reading for the back room was 35 foot candles with values ranging from 34 to 36 foot candles.

Overall mean noise level for the front room was 65.1 decibels with values ranging from 61.4 to 66.0 decibels.

Overall mean noise level for the back room was 64.4 decibels with values ranging from 60.6 to 68.5 decibels.

All room environmental monitoring was within protocol specifications.

**Figure 1 Schematic of Inhalation Exposure System – Control System**

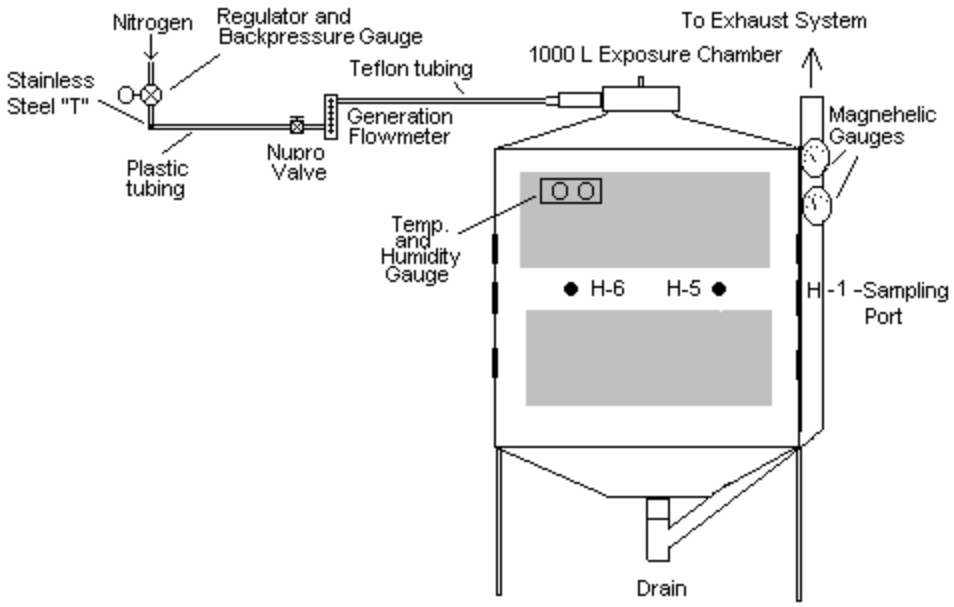
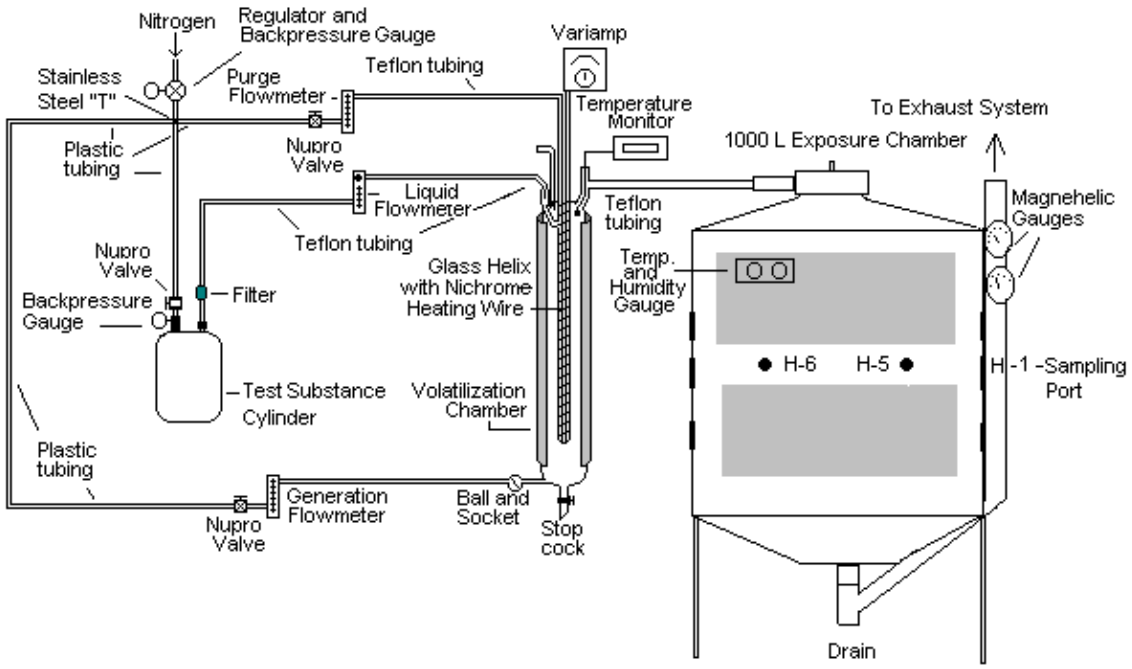


**Figure 2 Schematic of Inhalation Exposure System – Test System**



## Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) Values

| Exp Day | Group 1 Chamber 101M - Determined Concentration (mg/m$^3$)[a] | | | | |
|---|---|---|---|---|---|
| | Individual Samples | | | | Mean |
| 1 - 68 | 0 | 0 | 0 | 0 | 0 |
| Mean | | | 0 | | - |
| SD | | | - | | - |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

| Exp Day | Group 1 Chamber 102F - Determined Concentration (mg/m$^3$)[a] | | | | |
|---|---|---|---|---|---|
| | Individual Samples | | | | Mean |
| 1 - 68 | 0 | 0 | 0 | 0 | 0 |
| Mean | | | 0 | | - |
| SD | | | - | | - |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) Values (Cont.)**

| Exp Day | Group 2 Chamber 201M - Determined Concentration ($mg/m^3$)[a] | | | | |
|---|---|---|---|---|---|
| | Individual Samples | | | | Mean |
| 1 | 2094 | 2339 | 1461 | 2112 | 2002 |
| 2 | 2236 | 2296 | 2020 | 2399 | 2238 |
| 3 | 1968 | 2302 | 1817 | 1775 | 1966 |
| 4 | 2055 | 1801 | 2152 | 2214 | 2056 |
| 5 | 1966 | 2570 | 2028 | 2186 | 2188 |
| 6 | 3500 | 1843 | 2282 | 1659 | 2321 |
| 7 | 2392 | 2067 | 1866 | 2277 | 2151 |
| 8 | 2067 | 1888 | 2071 | 1808 | 1959 |
| 9 | 2399 | 1817 | 1786 | 2031 | 2008 |
| 10 | 2017 | 1908 | 2004 | 1624 | 1888 |
| 11 | 2298 | 1835 | 1441 | 2255 | 1957 |
| 12 | 2098 | 1892 | 1801 | 1959 | 1938 |
| 13 | 2180 | 2227 | 2396 | 2491 | 2324 |
| 14 | 1760 | 1782 | 2058 | 1881 | 1870 |
| 15 | 2002 | 2067 | 2141 | 2367 | 2144 |
| 16 | 2399 | 1600 | 1646 | 2002 | 1912 |
| 17 | 1903 | 1903 | 2273 | 1760 | 1960 |
| 18 | 1928 | 2002 | 1943 | 1824 | 1924 |
| 19 | 1700 | 1843 | 2109 | 2155 | 1952 |
| 20 | 2967 | 2214 | 1700 | 2064 | 2236 |
| 21 | 1948 | 1797 | 1961 | 1877 | 1896 |
| 22 | 1875 | 2103 | 1722 | 1722 | 1856 |
| 23 | 1654 | 2364 | 1908 | 1988 | 1979 |
| 24 | 2146 | 2367 | 2399 | 1993 | 2226 |
| 25 | 1937 | 2004 | 2191 | 2013 | 2036 |
| 26 | 2261 | 1744 | 2159 | 1837 | 2000 |
| 27 | 1824 | 2096 | 1797 | 2017 | 1934 |
| 28 | 1901 | 2015 | 2107 | 2195 | 2055 |
| 29 | 1923 | 1955 | 2216 | 2121 | 2054 |
| 30 | 2399 | 1950 | 2166 | 2022 | 2134 |
| 31 | 2073 | 1643 | 2334 | 1932 | 1996 |
| 32 | 1995 | 2138 | 1879 | 1877 | 1972 |
| 33 | 1919 | 2046 | 2143 | 1917 | 2006 |
| 34 | 1779 | 2139 | 1687 | 2180 | 1946 |
| 35 | 2396 | 1600 | 2399 | 1950 | 2086 |
| 36 | 2307 | 1727 | 1988 | 2150 | 2043 |
| 37 | 1850 | 1819 | 1624 | 2714 | 2002 |
| 38 | 2672 | 2399 | 1943 | 1966 | 2245 |

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) Values (Cont.)**

| Exp Day | Group 2 Chamber 201M - Determined Concentration ($mg/m^3$)[a] | | | | |
|---|---|---|---|---|---|
| | Individual Samples | | | | Mean |
| 39 | 1777 | 2300 | 1846 | 1901 | 1956 |
| 40 | 1793 | 1957 | 2017 | 1935 | 1926 |
| 41 | 1993 | 1619 | 1624 | 2076 | 1828 |
| 42 | 2360 | 1782 | 2094 | 2350 | 2147 |
| 43 | 2006 | 1793 | 1986 | 2058 | 1961 |
| 44 | 2024 | 1646 | 1948 | 2002 | 1905 |
| 45 | 2452 | 2049 | 2130 | 2082 | 2178 |
| 46 | 2277 | 2321 | 1935 | 2981 | 2379 |
| 47 | 2509 | 2087 | 2184 | 1895 | 2169 |
| 48 | 2011 | 1815 | 2236 | 2085 | 2037 |
| 49 | 1937 | 1957 | 2114 | 2024 | 2008 |
| 50 | 2173 | 1935 | 2392 | 2396 | 2224 |
| 51 | 2171 | 1861 | 2013 | 1843 | 1972 |
| 52 | 1768 | 1948 | 1973 | 2357 | 2012 |
| 53 | 2134 | 2230 | 1764 | 1859 | 1997 |
| 54 | 1835 | 2064 | 1830 | 2035 | 1941 |
| 55 | 1817 | 1919 | 1837 | 1828 | 1850 |
| 56 | 1797 | 1957 | 1711 | 1906 | 1843 |
| 57 | 2103 | 1883 | 1793 | 2035 | 1954 |
| 58 | 1821 | 1977 | 1866 | 2096 | 1940 |
| 59 | 1727 | 2109 | 1899 | 2060 | 1949 |
| 60 | 1813 | 1932 | 2103 | 2073 | 1980 |
| 61 | 2073 | 1746 | 2028 | 1941 | 1947 |
| 62 | 1986 | 2369 | 1919 | 2002 | 2069 |
| 63 | 1932 | 1888 | 1659 | 2040 | 1880 |
| 64 | 2015 | 1895 | 1977 | 1930 | 1954 |
| 65 | 1993 | 2186 | 2123 | 2177 | 2120 |
| 66 | 1919 | 1941 | 1881 | 2071 | 1953 |
| 67 | 1868 | 1981 | 1923 | 1981 | 1938 |
| 68 | 2085 | 1886 | 1993 | 2073 | 2009 |
| Mean | | | 2022 | | - |
| SD | | | 245 | | - |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) Values (Cont.)**

| Exp Day | Group 2 Chamber 202F - Determined Concentration ($mg/m^3$)[a] | | | | |
|---|---|---|---|---|---|
| | Individual Samples | | | | Mean |
| 1 | 1855 | 2186 | 2071 | 1826 | 1985 |
| 2 | 1890 | 2318 | 1852 | 1801 | 1965 |
| 3 | 2035 | 1755 | 2175 | 1324 | 1822 |
| 4 | 2394 | 1635 | 1799 | 1777 | 1901 |
| 5 | 1742 | 1915 | 2245 | 1981 | 1971 |
| 6 | 1990 | 2296 | 2399 | 2184 | 2217 |
| 7 | 3721 | 2341 | 1981 | 2768 | 2703 |
| 8 | 1910 | 2266 | 2307 | 2330 | 2203 |
| 9 | 1600 | 2175 | 2123 | 2225 | 2031 |
| 10 | 1624 | 1817 | 1843 | 2008 | 1823 |
| 11 | 1683 | 1861 | 2280 | 2502 | 2082 |
| 12 | 1892 | 2376 | 2399 | 2275 | 2236 |
| 13 | 1950 | 2230 | 2098 | 2298 | 2144 |
| 14 | 1826 | 2033 | 2085 | 1973 | 1979 |
| 15 | 1766 | 2134 | 2141 | 2245 | 2072 |
| 16 | 1932 | 2218 | 1990 | 1877 | 2004 |
| 17 | 1700 | 1950 | 2396 | 2362 | 2102 |
| 18 | 1866 | 2067 | 2286 | 2273 | 2123 |
| 19 | 1881 | 1667 | 1819 | 1941 | 1827 |
| 20 | 2035 | 2392 | 1993 | 2546 | 2242 |
| 21 | 1804 | 2255 | 2302 | 2376 | 2184 |
| 22 | 2305 | 1906 | 2232 | 2357 | 2200 |
| 23 | 2209 | 2877 | 2318 | 2046 | 2363 |
| 24 | 1635 | 2367 | 2273 | 2291 | 2142 |
| 25 | 2309 | 2042 | 1855 | 2089 | 2074 |
| 26 | 1910 | 2089 | 2209 | 1718 | 1982 |
| 27 | 2159 | 1999 | 1932 | 2069 | 2040 |
| 28 | 3206 | 2257 | 1910 | 2040 | 2353 |
| 29 | 1930 | 2103 | 2367 | 2257 | 2164 |
| 30 | 1718 | 1602 | 2107 | 2184 | 1903 |
| 31 | 1491 | 2107 | 1335 | 2107 | 1760 |
| 32 | 2757 | 2811 | 2394 | 2191 | 2538 |
| 33 | 2396 | 1897 | 2114 | 2114 | 2130 |
| 34 | 2309 | 2591 | 1713 | 1600 | 2053 |
| 35 | 2270 | 2703 | 2028 | 1707 | 2177 |
| 36 | 2542 | 1552 | 2289 | 2078 | 2115 |
| 37 | 2399 | 2189 | 2069 | 2396 | 2263 |
| 38 | 2087 | 2307 | 2307 | 2551 | 2313 |

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) Values (Cont.)**

| Exp Day | Group 2 Chamber 202F - Determined Concentration ($mg/m^3$)[a] | | | | |
|---|---|---|---|---|---|
| | Individual Samples | | | | Mean |
| 39 | 1950 | 1786 | 1859 | 2293 | 1972 |
| 40 | 1552 | 2305 | 2321 | 1968 | 2037 |
| 41 | 2761 | 2399 | 2161 | 2323 | 2411 |
| 42 | 2002 | 2239 | 2236 | 2116 | 2148 |
| 43 | 2300 | 2202 | 1923 | 1722 | 2037 |
| 44 | 2677 | 2360 | 2369 | 2017 | 2356 |
| 45 | 2141 | 2044 | 1552 | 2175 | 1978 |
| 46 | 1348 | 2380 | 1964 | 1937 | 1907 |
| 47 | 1711 | 2264 | 2013 | 1624 | 1903 |
| 48 | 2314 | 1888 | 2195 | 2307 | 2176 |
| 49 | 2549 | 2360 | 2259 | 2248 | 2354 |
| 50 | 1937 | 2046 | 2747 | 1977 | 2177 |
| 51 | 2143 | 2141 | 2004 | 2091 | 2095 |
| 52 | 2230 | 2318 | 1848 | 1990 | 2097 |
| 53 | 2055 | 2742 | 2639 | 2202 | 2410 |
| 54 | 2248 | 1749 | 2173 | 1784 | 1989 |
| 55 | 2078 | 2141 | 2037 | 2109 | 2091 |
| 56 | 2013 | 2116 | 1919 | 1970 | 2005 |
| 57 | 2096 | 1875 | 2143 | 2022 | 2034 |
| 58 | 1903 | 1943 | 2245 | 1788 | 1970 |
| 59 | 1943 | 2107 | 2058 | 1915 | 2006 |
| 60 | 1846 | 1988 | 2556 | 2289 | 2170 |
| 61 | 2261 | 1950 | 2064 | 1961 | 2059 |
| 62 | 1964 | 2046 | 2085 | 2211 | 2077 |
| 63 | 2175 | 2171 | 1733 | 2218 | 2074 |
| 64 | 1915 | 2371 | 2198 | 2177 | 2165 |
| 65 | 2182 | 2152 | 2114 | 2177 | 2156 |
| 66 | 1890 | 1952 | 1903 | 2105 | 1963 |
| 67 | 1970 | 2002 | 2164 | 1910 | 2012 |
| 68 | 2302 | 2073 | 2080 | 2410 | 2216 |
| Mean | | | 2106 | | - |
| SD | | | 290 | | - |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) Values (Cont.)**

| Exp Day | Group 3 Chamber 301M - Determined Concentration (mg/m$^3$)[a] | | | | |
|---|---|---|---|---|---|
| | Individual Samples | | | | Mean |
| 1 | 9922 | 10760 | 10070 | 10820 | 10390 |
| 2 | 9392 | 10370 | 9981 | 9451 | 9799 |
| 3 | 10550 | 9745 | 10640 | 9833 | 10190 |
| 4 | 11540 | 8664 | 10940 | 9509 | 10160 |
| 5 | 10310 | 9863 | 11060 | 10730 | 10490 |
| 6 | 10700 | 12480 | 9892 | 11990 | 11270 |
| 7 | 10700 | 9952 | 10430 | 10970 | 10510 |
| 8 | 10940 | 10100 | 9597 | 11570 | 10550 |
| 9 | 11690 | 9421 | 9158 | 10760 | 10260 |
| 10 | 9952 | 8867 | 10010 | 13460 | 10570 |
| 11 | 10340 | 11030 | 9568 | 13090 | 11010 |
| 12 | 11150 | 11150 | 11390 | 11330 | 11260 |
| 13 | 10280 | 10640 | 10820 | 10340 | 10520 |
| 14 | 11750 | 10190 | 10700 | 10040 | 10670 |
| 15 | 9304 | 10880 | 10580 | 10580 | 10340 |
| 16 | 9686 | 11090 | 10940 | 11240 | 10740 |
| 17 | 11120 | 11450 | 11630 | 11030 | 11310 |
| 18 | 9863 | 10190 | 10130 | 10400 | 10150 |
| 19 | 12780 | 8838 | 10040 | 11210 | 10720 |
| 20 | 9981 | 9804 | 9804 | 11600 | 10300 |
| 21 | 10670 | 11540 | 11840 | 12170 | 11560 |
| 22 | 10100 | 10970 | 9686 | 10280 | 10260 |
| 23 | 10250 | 10640 | 10220 | 9745 | 10210 |
| 24 | 9012 | 11570 | 10640 | 10040 | 10320 |
| 25 | 10130 | 8433 | 11480 | 10850 | 10220 |
| 26 | 11480 | 10790 | 10850 | 9774 | 10720 |
| 27 | 11630 | 10040 | 8003 | 8867 | 9635 |
| 28 | 11990 | 10190 | 9804 | 11450 | 10860 |
| 29 | 10010 | 10850 | 9627 | 11120 | 10400 |
| 30 | 10850 | 9745 | 11000 | 11960 | 10890 |
| 31 | 12810 | 11330 | 10580 | 10790 | 11380 |
| 32 | 11420 | 11690 | 11090 | 10070 | 11070 |
| 33 | 11300 | 8462 | 10640 | 10130 | 10130 |
| 34 | 9892 | 9451 | 11270 | 9100 | 9928 |
| 35 | 9774 | 9451 | 10550 | 9597 | 9843 |
| 36 | 8867 | 9804 | 9627 | 10550 | 9712 |
| 37 | 10340 | 8954 | 8491 | 10190 | 9494 |
| 38 | 8261 | 10010 | 9275 | 9392 | 9235 |

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) Values (Cont.)**

| Exp Day | Group 3 Chamber 301M - Determined Concentration ($mg/m^3$)[a] | | | | |
|---|---|---|---|---|---|
| | Individual Samples | | | | Mean |
| 39 | 9863 | 9304 | 9158 | 12570 | 10220 |
| 40 | 10460 | 8867 | 9451 | 10580 | 9840 |
| 41 | 9392 | 9100 | 10190 | 11030 | 9928 |
| 42 | 9686 | 9922 | 9863 | 9216 | 9672 |
| 43 | 9627 | 10790 | 10400 | 10160 | 10240 |
| 44 | 10250 | 9392 | 9892 | 11690 | 10310 |
| 45 | 11990 | 9597 | 10890 | 8376 | 10210 |
| 46 | 8606 | 10280 | 10280 | 9480 | 9662 |
| 47 | 11360 | 10070 | 9070 | 9922 | 10110 |
| 48 | 11300 | 10010 | 9216 | 10010 | 10130 |
| 49 | 9041 | 9981 | 9070 | 10160 | 9563 |
| 50 | 10700 | 9451 | 9363 | 9656 | 9793 |
| 51 | 10670 | 10190 | 9686 | 10490 | 10260 |
| 52 | 10910 | 10490 | 10850 | 11090 | 10840 |
| 53 | 9509 | 10100 | 10880 | 10370 | 10210 |
| 54 | 10580 | 10100 | 10160 | 10010 | 10210 |
| 55 | 10370 | 10640 | 10520 | 9952 | 10370 |
| 56 | 10220 | 9952 | 9627 | 10040 | 9960 |
| 57 | 9568 | 9922 | 10460 | 9627 | 9894 |
| 58 | 10250 | 9952 | 9246 | 9070 | 9630 |
| 59 | 9304 | 9952 | 9539 | 10760 | 9889 |
| 60 | 9597 | 9539 | 9539 | 10400 | 9769 |
| 61 | 9833 | 10040 | 9952 | 10280 | 10030 |
| 62 | 10640 | 10640 | 10700 | 10730 | 10680 |
| 63 | 10670 | 10250 | 10250 | 10400 | 10390 |
| 64 | 10130 | 10130 | 10160 | 10010 | 10110 |
| 65 | 10400 | 10490 | 10370 | 10160 | 10360 |
| 66 | 10250 | 9952 | 9892 | 9981 | 10020 |
| 67 | 10970 | 10400 | 10340 | 10280 | 10500 |
| 68 | 10070 | 9686 | 9833 | 9597 | 9797 |
| Mean | | | 10290 | | - |
| SD | | | 861 | | - |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) Values (Cont.)**

| Exp Day | Group 3 Chamber 302F - Determined Concentration ($mg/m^3$)[a] | | | | |
|---|---|---|---|---|---|
| | Individual Samples | | | | Mean |
| 1 | 11360 | 10130 | 11000 | 9627 | 10530 |
| 2 | 11150 | 10580 | 10010 | 9745 | 10370 |
| 3 | 10550 | 10280 | 10430 | 10370 | 10410 |
| 4 | 9715 | 10640 | 9100 | 10670 | 10030 |
| 5 | 9304 | 10590 | 9129 | 10190 | 9803 |
| 6 | 11990 | 9392 | 9392 | 10490 | 10320 |
| 7 | 11990 | 9158 | 9981 | 10610 | 10430 |
| 8 | 11240 | 10310 | 10190 | 10400 | 10540 |
| 9 | 12750 | 9451 | 10280 | 9981 | 10620 |
| 10 | 9804 | 9333 | 9451 | 11240 | 9957 |
| 11 | 8003 | 9246 | 9627 | 9509 | 9096 |
| 12 | 9333 | 9070 | 10520 | 10700 | 9906 |
| 13 | 11390 | 11120 | 10880 | 10430 | 10960 |
| 14 | 12660 | 9981 | 10460 | 9833 | 10730 |
| 15 | 10790 | 10580 | 9981 | 10460 | 10450 |
| 16 | 10250 | 9187 | 10340 | 11150 | 10230 |
| 17 | 9892 | 9892 | 10700 | 10430 | 10230 |
| 18 | 10040 | 10400 | 10700 | 11840 | 10750 |
| 19 | 10400 | 10970 | 9922 | 11330 | 10660 |
| 20 | 10280 | 10340 | 10010 | 10760 | 10350 |
| 21 | 8809 | 10580 | 10040 | 11240 | 10170 |
| 22 | 11990 | 9304 | 8722 | 9892 | 9977 |
| 23 | 10370 | 8635 | 10160 | 8635 | 9450 |
| 24 | 9158 | 10010 | 9539 | 10610 | 9829 |
| 25 | 10730 | 9100 | 8433 | 11030 | 9823 |
| 26 | 10850 | 8433 | 9686 | 10370 | 9835 |
| 27 | 10400 | 10130 | 9363 | 9863 | 9939 |
| 28 | 9892 | 10160 | 11840 | 10010 | 10480 |
| 29 | 9892 | 11450 | 11270 | 10340 | 10740 |
| 30 | 11090 | 10250 | 10490 | 11000 | 10710 |
| 31 | 10940 | 10070 | 9597 | 10280 | 10220 |
| 32 | 12390 | 8376 | 10880 | 11720 | 10840 |
| 33 | 11900 | 9012 | 10700 | 10100 | 10430 |
| 34 | 11300 | 10010 | 10130 | 10010 | 10360 |
| 35 | 9715 | 10430 | 10850 | 10070 | 10270 |
| 36 | 11480 | 11990 | 10850 | 10040 | 11090 |
| 37 | 13300 | 9804 | 9509 | 10520 | 10780 |
| 38 | 9216 | 10910 | 10070 | 12230 | 10610 |

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) Values (Cont.)**

| Exp Day | Group 3 Chamber 302F - Determined Concentration ($mg/m^3$)[a] | | | | |
|---|---|---|---|---|---|
| | Individual Samples | | | | Mean |
| 39 | 9216 | 10670 | 11120 | 10460 | 10370 |
| 40 | 11180 | 11540 | 10400 | 10670 | 10950 |
| 41 | 10100 | 9509 | 11900 | 10310 | 10450 |
| 42 | 9100 | 11030 | 11990 | 10220 | 10590 |
| 43 | 12570 | 10610 | 9480 | 10940 | 10900 |
| 44 | 10070 | 10880 | 10730 | 9922 | 10400 |
| 45 | 10430 | 10760 | 11990 | 9715 | 10720 |
| 46 | 11690 | 10400 | 8722 | 9952 | 10190 |
| 47 | 9012 | 10700 | 10040 | 9922 | 9919 |
| 48 | 9070 | 11300 | 10490 | 10160 | 10260 |
| 49 | 9275 | 10280 | 9509 | 9804 | 9717 |
| 50 | 10490 | 10250 | 9774 | 10490 | 10250 |
| 51 | 10550 | 10010 | 10040 | 9246 | 9962 |
| 52 | 9863 | 10640 | 10250 | 10340 | 10270 |
| 53 | 9187 | 9892 | 10190 | 9686 | 9739 |
| 54 | 10280 | 10460 | 10130 | 10730 | 10400 |
| 55 | 10190 | 10490 | 10370 | 10190 | 10310 |
| 56 | 10640 | 10370 | 10640 | 11360 | 10750 |
| 57 | 9480 | 9451 | 10760 | 10040 | 9933 |
| 58 | 10490 | 11300 | 10400 | 9745 | 10480 |
| 59 | 8606 | 9597 | 9333 | 10100 | 9409 |
| 60 | 11300 | 11450 | 11210 | 11150 | 11280 |
| 61 | 11120 | 10820 | 10940 | 11300 | 11050 |
| 62 | 10130 | 11060 | 10850 | 11060 | 10780 |
| 63 | 10940 | 11420 | 11870 | 11660 | 11470 |
| 64 | 11270 | 10340 | 10730 | 11030 | 10840 |
| 65 | 11870 | 11030 | 11360 | 11330 | 11400 |
| 66 | 9833 | 10160 | 10670 | 10340 | 10250 |
| 67 | 10550 | 10280 | 10280 | 10190 | 10330 |
| 68 | 10160 | 10010 | 10640 | 10100 | 10230 |
| Mean | | | 10380 | | - |
| SD | | | 841 | | - |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) Values (Cont.)**

| Exp Day | Group 4 Chamber 401M - Determined Concentration ($mg/m^3$)[a] | | | | |
|---|---|---|---|---|---|
| | Individual Samples | | | | Mean |
| 1 | 21660 | 22830 | 19860 | 19060 | 20850 |
| 2 | 19800 | 23330 | 21720 | 22370 | 21810 |
| 3 | 22800 | 20490 | 21570 | 20880 | 21440 |
| 4 | 21540 | 21300 | 21480 | 21780 | 21530 |
| 5 | 20190 | 19090 | 19580 | 20490 | 19840 |
| 6 | 19250 | 18420 | 20430 | 19520 | 19410 |
| 7 | 21480 | 20790 | 19730 | 19580 | 20400 |
| 8 | 19090 | 22950 | 21480 | 19760 | 20820 |
| 9 | 22450 | 21540 | 21120 | 22660 | 21940 |
| 10 | 20490 | 20010 | 19460 | 20700 | 20170 |
| 11 | 20910 | 21540 | 21890 | 22220 | 21640 |
| 12 | 23210 | 22630 | 21950 | 22220 | 22500 |
| 13 | 23090 | 21980 | 21570 | 21120 | 21940 |
| 14 | 20820 | 20280 | 22540 | 20910 | 21140 |
| 15 | 21420 | 20640 | 19550 | 19280 | 20220 |
| 16 | 21540 | 20160 | 20190 | 21660 | 20890 |
| 17 | 20340 | 20610 | 19370 | 20340 | 20170 |
| 18 | 20130 | 21570 | 20820 | 19610 | 20530 |
| 19 | 19830 | 19670 | 20610 | 19190 | 19830 |
| 20 | 21660 | 23120 | 21450 | 21720 | 21990 |
| 21 | 23980 | 20430 | 20250 | 21000 | 21420 |
| 22 | 21210 | 18240 | 17010 | 21090 | 19390 |
| 23 | 20640 | 19130 | 17780 | 19430 | 19250 |
| 24 | 23470 | 21810 | 21270 | 19760 | 21580 |
| 25 | 21120 | 19130 | 19030 | 19830 | 19780 |
| 26 | 22540 | 21480 | 21090 | 22220 | 21830 |
| 27 | 21030 | 21030 | 20070 | 23300 | 21360 |
| 28 | 21270 | 20910 | 20640 | 22630 | 21360 |
| 29 | 21980 | 21600 | 21600 | 21540 | 21680 |
| 30 | 21480 | 20430 | 20880 | 22800 | 21400 |
| 31 | 20370 | 20100 | 19640 | 20760 | 20220 |
| 32 | 22130 | 21390 | 20970 | 22480 | 21740 |
| 33 | 20100 | 18510 | 18050 | 19580 | 19060 |
| 34 | 16360 | 17470 | 20880 | 20370 | 18770 |
| 35 | 21630 | 21030 | 21330 | 20580 | 21140 |
| 36 | 19370 | 20580 | 20280 | 19980 | 20050 |
| 37 | 22950 | 21510 | 22250 | 22250 | 22240 |
| 38 | 21000 | 21210 | 21360 | 22340 | 21480 |

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) Values (Cont.)**

| Exp Day | Group 4 Chamber 401M - Determined Concentration ($mg/m^3$)[a] | | | | |
|---|---|---|---|---|---|
| | Individual Samples | | | | Mean |
| 39 | 20190 | 18180 | 22510 | 21630 | 20630 |
| 40 | 22450 | 20220 | 19640 | 20730 | 20760 |
| 41 | 23900 | 22220 | 21300 | 22340 | 22440 |
| 42 | 22370 | 20310 | 19730 | 21210 | 20910 |
| 43 | 22220 | 21360 | 20370 | 20880 | 21210 |
| 44 | 18150 | 20850 | 20430 | 21090 | 20130 |
| 45 | 19000 | 20370 | 22250 | 21480 | 20780 |
| 46 | 19580 | 20760 | 22220 | 21150 | 20930 |
| 47 | 20460 | 20820 | 20580 | 20130 | 20500 |
| 48 | 19460 | 21270 | 20460 | 19640 | 20210 |
| 49 | 20730 | 21890 | 19830 | 17990 | 20110 |
| 50 | 19460 | 20070 | 21000 | 18970 | 19880 |
| 51 | 20220 | 21780 | 20670 | 23090 | 21440 |
| 52 | 22370 | 21540 | 22400 | 23300 | 22400 |
| 53 | 21210 | 20970 | 22780 | 22010 | 21740 |
| 54 | 20820 | 22950 | 21210 | 19860 | 21210 |
| 55 | 21510 | 22570 | 22800 | 21510 | 22100 |
| 56 | 21810 | 22220 | 22980 | 21660 | 22170 |
| 57 | 20220 | 20970 | 21150 | 22310 | 21160 |
| 58 | 21720 | 20850 | 20700 | 19640 | 20730 |
| 59 | 21920 | 21240 | 21950 | 21870 | 21750 |
| 60 | 20730 | 22420 | 20250 | 20730 | 21030 |
| 61 | 22860 | 21780 | 20220 | 19550 | 21100 |
| 62 | 22630 | 20850 | 21150 | 22540 | 21790 |
| 63 | 20910 | 22220 | 21000 | 20250 | 21100 |
| 64 | 24520 | 22190 | 21150 | 21240 | 22280 |
| 65 | 19610 | 20640 | 20700 | 21300 | 20560 |
| 66 | 20310 | 21510 | 21570 | 21870 | 21320 |
| 67 | 19800 | 21030 | 20880 | 20370 | 20520 |
| 68 | 19890 | 20310 | 20550 | 19730 | 20120 |
| Mean | | | 20970 | | - |
| SD | | | 1261 | | - |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) Values (Cont.)**

| Exp Day | Group 4 Chamber 402F - Determined Concentration ($mg/m^3$)[a] | | | | |
|---|---|---|---|---|---|
| | Individual Samples | | | | Mean |
| 1 | 18390 | 16510 | 17500 | 24550 | 19240 |
| 2 | 19310 | 23440 | 22570 | 22370 | 21920 |
| 3 | 21810 | 21480 | 20790 | 16760 | 20210 |
| 4 | 18640 | 18210 | 19670 | 20430 | 19240 |
| 5 | 18640 | 21480 | 19220 | 21270 | 20150 |
| 6 | 17440 | 21240 | 25300 | 19190 | 20790 |
| 7 | 20550 | 20430 | 20100 | 21630 | 20680 |
| 8 | 19550 | 20820 | 20700 | 19000 | 20020 |
| 9 | 25380 | 20280 | 19670 | 21180 | 21630 |
| 10 | 18360 | 20250 | 20550 | 19890 | 19760 |
| 11 | 19760 | 20430 | 19830 | 20070 | 20020 |
| 12 | 19830 | 19920 | 22540 | 22630 | 21230 |
| 13 | 19160 | 20220 | 19520 | 21360 | 20070 |
| 14 | 20160 | 19430 | 20400 | 21030 | 20260 |
| 15 | 17130 | 20880 | 19760 | 17990 | 18940 |
| 16 | 20610 | 18330 | 19280 | 18080 | 19080 |
| 17 | 15210 | 19520 | 19250 | 18390 | 18090 |
| 18 | 20160 | 21240 | 21180 | 18540 | 20280 |
| 19 | 20340 | 19830 | 22400 | 19340 | 20480 |
| 20 | 20310 | 18940 | 20640 | 21060 | 20240 |
| 21 | 20550 | 18210 | 20010 | 14900 | 18420 |
| 22 | 22980 | 19760 | 19550 | 21000 | 20820 |
| 23 | 19980 | 22040 | 21750 | 21060 | 21210 |
| 24 | 19670 | 18670 | 20610 | 20580 | 19880 |
| 25 | 18910 | 20580 | 18760 | 17840 | 19020 |
| 26 | 20850 | 19000 | 20010 | 21330 | 20300 |
| 27 | 19130 | 18880 | 19580 | 21780 | 19840 |
| 28 | 19090 | 20310 | 19550 | 21090 | 20010 |
| 29 | 20970 | 19550 | 20430 | 16940 | 19470 |
| 30 | 21600 | 20970 | 20730 | 21660 | 21240 |
| 31 | 18020 | 19160 | 17930 | 18820 | 18480 |
| 32 | 21180 | 19190 | 20160 | 19370 | 19980 |
| 33 | 20700 | 19340 | 19490 | 19980 | 19880 |
| 34 | 17930 | 18670 | 17840 | 21090 | 18880 |
| 35 | 21030 | 19920 | 19920 | 19340 | 20050 |
| 36 | 14750 | 18210 | 20190 | 19370 | 18130 |
| 37 | 18760 | 20130 | 20460 | 21480 | 20210 |
| 38 | 19400 | 16290 | 18640 | 20670 | 18750 |

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) Values (Cont.)**

| Exp Day | Group 4 Chamber 402F - Determined Concentration ($mg/m^3$)[a] | | | | |
|---|---|---|---|---|---|
| | Individual Samples | | | | Mean |
| 39 | 16480 | 20070 | 23470 | 21600 | 20410 |
| 40 | 20520 | 19700 | 20760 | 20490 | 20370 |
| 41 | 21870 | 22570 | 22370 | 22400 | 22300 |
| 42 | 21980 | 21540 | 21180 | 23530 | 22060 |
| 43 | 23270 | 21750 | 21480 | 20760 | 21820 |
| 44 | 22370 | 19030 | 22310 | 20280 | 21000 |
| 45 | 20490 | 19830 | 22950 | 21570 | 21210 |
| 46 | 20970 | 22750 | 17340 | 23350 | 21100 |
| 47 | 20520 | 23870 | 16140 | 16600 | 19280 |
| 48 | 20880 | 21780 | 21480 | 21810 | 21490 |
| 49 | 18510 | 19670 | 20160 | 20820 | 19790 |
| 50 | 20670 | 21720 | 20730 | 21030 | 21040 |
| 51 | 21780 | 21690 | 22160 | 22920 | 22140 |
| 52 | 22130 | 21840 | 21750 | 21510 | 21810 |
| 53 | 19980 | 22280 | 21120 | 20520 | 20980 |
| 54 | 21420 | 22340 | 22660 | 22600 | 22260 |
| 55 | 22340 | 21690 | 21870 | 23090 | 22250 |
| 56 | 22450 | 23350 | 22190 | 21360 | 22340 |
| 57 | 23500 | 21330 | 22890 | 21950 | 22420 |
| 58 | 21330 | 21750 | 20670 | 20430 | 21050 |
| 59 | 22220 | 21000 | 20850 | 21510 | 21400 |
| 60 | 21150 | 21630 | 21780 | 21540 | 21530 |
| 61 | 21810 | 22720 | 22890 | 21690 | 22280 |
| 62 | 20880 | 22540 | 23640 | 22890 | 22490 |
| 63 | 22510 | 21780 | 21180 | 20940 | 21600 |
| 64 | 26380 | 23090 | 22250 | 22130 | 23460 |
| 65 | 22860 | 21810 | 20670 | 21510 | 21710 |
| 66 | 21360 | 21660 | 22310 | 22600 | 21980 |
| 67 | 21660 | 21510 | 20820 | 21600 | 21400 |
| 68 | 21090 | 22600 | 21030 | 21090 | 21450 |
| Mean | | | 20640 | | - |
| SD | | | 1749 | | - |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

## Table 2 Nominal Concentration – Mean Values

| Exp Day | Determined Nominal Concentration (mg/m$^3$)[a] | | | | | |
|---|---|---|---|---|---|---|
| | Group 2 Chamber | | Group 3 Chamber | | Group 4 Chamber | |
| | 201M | 202F | 301M | 302F | 401M | 402F |
| 1 | 2658 | 2658 | 15720 | 16100 | 21100 | 17920 |
| 2 | 2658 | 2658 | 13100 | 13420 | 23440 | 23040 |
| 3 | 2658 | 2658 | 13100 | 16100 | 21100 | 20480 |
| 4 | 2658 | 2658 | 13100 | 13420 | 23440 | 20480 |
| 5 | 2658 | 2658 | 13100 | 13420 | 18750 | 20480 |
| 6 | 2658[b] | 2658[b] | 15720 | 16100 | 21100 | 20480 |
| 7 | 1329 | | 15720 | 16100 | 21100 | 23040 |
| 8 | 3987 | | 13100 | 10740 | 23440 | 20480 |
| 9 | 1329 | | 13100 | 16100 | 21100 | 20480 |
| 10 | 3987 | | 13100[b] | 13420[b] | 21100 | 20480 |
| 11 | 2658 | | 14580 | | 21100 | 23040 |
| 12 | 1329 | | 14580 | | 23440 | 20480 |
| 13 | 2658 | | 14580 | | 23440 | 20480 |
| 14 | 2658 | | 15910 | | 21100 | 23040 |
| 15 | 2658 | | 13260 | | 23440 | 20480 |
| 16 | 1329 | | 15910 | | 21100 | 20480 |
| 17 | 2658 | | 15910 | | 21100 | 20480 |
| 18 | 2658 | | 14580 | | 21100 | 20480 |
| 19 | 3987 | | 14580 | | 21100 | 23040 |
| 20 | 1329 | | 15910 | | 23440 | 20480 |
| 21 | 3987 | | 14580 | | 23440 | 20480 |
| 22 | 1329 | | 14580 | | 18750 | 23040 |
| 23 | 3987 | | 14580 | | 23440 | 23040 |
| 24 | 2658 | | 15910 | | 23440 | 20480 |
| 25 | 2658 | | 13260 | | 21100 | 20480 |
| 26 | 2658 | | 13260 | | 23440 | 23040 |
| 27 | 1329 | | 13260 | | 21100 | 20480 |
| 28 | 2658 | | 17240 | | 23440 | 23040 |
| 29 | 2658 | | 14580 | | 23440 | 23040 |
| 30 | 2658 | | 14580 | | 23440 | 23040 |
| 31 | 3987 | | 11930 | | 21100 | 20480 |
| 32 | 2565 | | 13060 | | 23280 | 20790 |
| 33 | 2379 | | 11710 | | 21520 | 21480 |
| 34 | 2313 | | 11600 | | 21140 | 21480 |
| 35 | 2180 | | 11850 | | 21350 | 21860 |
| 36 | 2392 | | 11280 | | 21070 | 20940 |
| 37 | 2671 | | 11260 | | 23720 | 22380 |
| 38 | 2432 | | 11380 | | 22970 | 20810 |

**Table 2 Nominal Concentration – Mean Values (Cont'd)**

| Exp Day | Determined Nominal Concentration (mg/m$^3$)[a] | | | | | |
|---|---|---|---|---|---|---|
| | Group 2 Chamber | | Group 3 Chamber | | Group 4 Chamber | |
| | 201M | 202F | 301M | 302F | 401M | 402F |
| 39 | 2552 | | 12030 | | 22570 | 22220 |
| 40 | 2525 | | 11960 | | 22570 | 21840 |
| 41 | 2565 | | 11670 | | 21780 | 25060 |
| 42 | 2539 | | 11560 | | 21990 | 24400 |
| 43 | 2352 | | 11880 | | 20790 | 23680 |
| 44 | 2166 | | 12200 | | 21030 | 23580 |
| 45 | 2352 | | 11600 | | 21610 | 23580 |
| 46 | 2379 | | 11760 | | 20600 | 24220 |
| 47 | 2299 | | 11720 | | 20230 | 22840 |
| 48 | 2525 | | 11890 | | 21070 | 23350 |
| 49 | 2871 | | 11090 | | 20770 | 23630 |
| 50 | 2472 | | 11260 | | 22220 | 24120 |
| 51 | 2366 | | 11220 | | 21780 | 23810 |
| 52 | 2406 | | 11110 | | 22040 | 23630 |
| 53 | 2432 | | 11480 | | 22290 | 22500 |
| 54 | 2259 | | 11040 | | 21780 | 23810 |
| 55 | 2273 | | 11150 | | 21660 | 23860 |
| 56 | 2313 | | 10980 | | 21780 | 22960 |
| 57 | 2326 | | 11260 | | 21750 | 23300 |
| 58 | 2472 | | 10700 | | 20960 | 22300 |
| 59 | 2406 | | 11120 | | 21350 | 22630 |
| 60 | 2485 | | 11720 | | 21100 | 22200 |
| 61 | 2352 | | 11600 | | 21870 | 23430 |
| 62 | 2352 | | 11880 | | 21330 | 22890 |
| 63 | 2273 | | 11670 | | 20720 | 22200 |
| 64 | 2299 | | 11560 | | 21800 | 23760 |
| 65 | 2313 | | 11680 | | 20530 | 22500 |
| 66 | 2379 | | 11520 | | 20890 | 22940 |
| 67 | 2379 | | 11480 | | 20370 | 22320 |
| 68 | 2352 | | 11120 | | 20790 | 22320 |
| Mean[c] | 2658 | 2658 | 13890 | 14492 | - | - |
| SD[c] | - | - | 1266 | 1874 | - | - |
| Mean[d] | 2485 | | 12670 | | 21750 | 22150 |
| SD[d] | 629 | | 1703 | | 1153 | 1428 |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.
[b] Insufficient weight loss from cylinder to accurately calculate nominal (amount lost outside the limits of the balance used to measure the dispensed material). System changed so single cylinder shared between two chambers per each group in order to permit a more accurate nominal calculation.
[c] Mean and SD for Days 1 to 6 (Group 2) and Days 1 to 10 (Group 3).
[d] Mean and SD for Days 7 to 68 (Group 2), Days 11 to 68 (Group 3) and Days 1 to 68 (Group 4)

## Table 3 Chamber Temperature - Mean Values

| Exp Day | Temperature (°C)[a] | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Group 1 Chamber | | Group 2 Chamber | | Group 3 Chamber | | Group 4 Chamber | |
| | 101M | 102F | 201M | 202F | 301M | 302F | 401M | 402F |
| 1 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |
| 2 | 25 | 23 | 24 | 23 | 24 | 23 | 24 | 23 |
| 3 | 23 | 23 | 23 | 22 | 22 | 22 | 23 | 22 |
| 4 | 23 | 23 | 23 | 22 | 22 | 22 | 23 | 23 |
| 5 | 23 | 23 | 23 | 22 | 22 | 22 | 23 | 23 |
| 6 | 25 | 25 | 25 | 24 | 25 | 24 | 25 | 25 |
| 7 | 24 | 24 | 24 | 24 | 24 | 24 | 25 | 25 |
| 8 | 25 | 24 | 24 | 24 | 24 | 23 | 25 | 24 |
| 9 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| 10 | 22 | 22 | 22 | 22 | 21 | 21 | 22 | 22 |
| 11 | 23 | 22 | 22 | 22 | 21 | 21 | 22 | 22 |
| 12 | 23 | 22 | 23 | 22 | 22 | 21 | 23 | 23 |
| 13 | 23 | 22 | 22 | 21 | 21 | 21 | 22 | 22 |
| 14 | 23 | 22 | 22 | 21 | 21 | 21 | 22 | 22 |
| 15 | 23 | 23 | 23 | 22 | 22 | 22 | 23 | 23 |
| 16 | 24 | 23 | 23 | 23 | 22 | 22 | 24 | 23 |
| 17 | 21 | 21 | 21 | 20 | 20 | 20 | 21 | 21 |
| 18 | 23 | 22 | 22 | 22 | 21 | 21 | 22 | 22 |
| 19 | 22 | 22 | 21 | 21 | 21 | 21 | 22 | 22 |
| 20 | 23 | 23 | 23 | 22 | 23 | 22 | 24 | 23 |
| 21 | 23 | 22 | 23 | 22 | 21 | 21 | 23 | 22 |
| 22 | 23 | 23 | 23 | 22 | 21 | 22 | 23 | 23 |
| 23 | 23 | 22 | 22 | 21 | 21 | 21 | 22 | 22 |
| 24 | 22 | 21 | 21 | 21 | 20 | 20 | 21 | 21 |
| 25 | 21 | 21 | 20 | 20 | 19 | 19 | 21 | 21 |
| 26 | 22 | 21 | 21 | 20 | 20 | 19 | 21 | 21 |
| 27 | 21 | 21 | 21 | 20 | 20 | 19 | 21 | 21 |
| 28 | 22 | 21 | 21 | 21 | 20 | 20 | 21 | 22 |
| 29 | 22 | 22 | 21 | 21 | 20 | 21 | 21 | 21 |
| 30 | 22 | 22 | 21 | 21 | 20 | 21 | 22 | 22 |
| 31 | 22 | 21 | 21 | 21 | 20 | 20 | 21 | 21 |
| 32 | 22 | 22 | 21 | 21 | 20 | 21 | 22 | 21 |
| 33 | 22 | 21 | 21 | 21 | 20 | 20 | 21 | 21 |
| 34 | 21 | 21 | 21 | 20 | 19 | 20 | 21 | 21 |
| 35 | 22 | 21 | 21 | 21 | 20 | 21 | 21 | 21 |
| 36 | 22 | 22 | 21 | 21 | 20 | 21 | 22 | 22 |
| 37 | 21 | 21 | 20 | 20 | 18 | 20 | 20 | 21 |

## Table 3 Chamber Temperature - Mean Values (Cont'd)

| Exp Day | Temperature (°C)[a] | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Group 1 Chamber | | Group 2 Chamber | | Group 3 Chamber | | Group 4 Chamber | |
| | 101M | 102F | 201M | 202F | 301M | 302F | 401M | 402F |
| 38 | 21 | 21 | 20 | 20 | 19 | 20 | 21 | 21 |
| 39 | 22 | 21 | 20 | 21 | 19 | 21 | 21 | 21 |
| 40 | 22 | 21 | 20 | 21 | 19 | 20 | 21 | 21 |
| 41 | 22 | 21 | 21 | 21 | 20 | 20 | 21 | 21 |
| 42 | 21 | 21 | 21 | 21 | 19 | 20 | 21 | 21 |
| 43 | 22 | 21 | 21 | 21 | 20 | 20 | 21 | 21 |
| 44 | 22 | 21 | 21 | 21 | 19 | 20 | 21 | 21 |
| 45 | 22 | 21 | 21 | 21 | 19 | 20 | 21 | 21 |
| 46 | 22 | 21 | 21 | 21 | 20 | 21 | 21 | 21 |
| 47 | 22 | 21 | 22 | 21 | 20 | 21 | 21 | 21 |
| 48 | 22 | 22 | 22 | 21 | 20 | 21 | 22 | 22 |
| 49 | 22 | 21 | 21 | 20 | 20 | 20 | 21 | 21 |
| 50 | 22 | 21 | 21 | 20 | 20 | 20 | 21 | 21 |
| 51 | 22 | 21 | 21 | 21 | 20 | 20 | 22 | 21 |
| 52 | 22 | 21 | 21 | 20 | 19 | 19 | 21 | 21 |
| 53 | 22 | 21 | 21 | 20 | 19 | 20 | 21 | 21 |
| 54 | 22 | 21 | 20 | 20 | 19 | 20 | 21 | 21 |
| 55 | 22 | 22 | 21 | 21 | 20 | 20 | 22 | 22 |
| 56 | 23 | 22 | 22 | 21 | 21 | 21 | 22 | 22 |
| 57 | 23 | 22 | 22 | 21 | 21 | 21 | 23 | 22 |
| 58 | 22 | 21 | 21 | 20 | 20 | 20 | 21 | 21 |
| 59 | 22 | 21 | 21 | 20 | 20 | 20 | 21 | 21 |
| 60 | 22 | 21 | 21 | 20 | 20 | 20 | 21 | 21 |
| 61 | 23 | 22 | 22 | 22 | 21 | 21 | 22 | 22 |
| 62 | 21 | 21 | 21 | 20 | 19 | 20 | 21 | 21 |
| 63 | 22 | 21 | 21 | 20 | 20 | 20 | 21 | 21 |
| 64 | 21 | 20 | 21 | 20 | 20 | 20 | 21 | 21 |
| 65 | 21 | 21 | 21 | 20 | 20 | 20 | 21 | 21 |
| 66 | 22 | 22 | 21 | 21 | 20 | 20 | 22 | 21 |
| 67 | 20 | 22 | 20 | 21 | 19 | 20 | 20 | 22 |
| 68 | 20 | 19 | 20 | 20 | 20 | 20 | 20 | 20 |
| Mean | 22 | 22 | 22 | 21 | 21 | 21 | 22 | 22 |
| SD | 1.0 | 1.0 | 1.2 | 1.1 | 1.5 | 1.1 | 1.2 | 1.0 |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

## Table 4 Chamber Relative Humidity - Mean Values

| Exp Day | Relative Humidity (%)[a] | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Group 1 Chamber | | Group 2 Chamber | | Group 3 Chamber | | Group 4 Chamber | |
| | 101M | 102F | 201M | 202F | 301M | 302F | 401M | 402F |
| 1 | 49 | 45 | 45 | 44 | 45 | 47 | 46 | 44 |
| 2 | 44 | 43 | 42 | 40 | 42 | 43 | 43 | 41 |
| 3 | 48 | 46 | 44 | 45 | 46 | 47 | 44 | 45 |
| 4 | 52 | 49 | 46 | 47 | 47 | 49 | 46 | 47 |
| 5 | 51 | 48 | 47 | 47 | 47 | 49 | 47 | 46 |
| 6 | 48 | 44 | 44 | 44 | 42 | 45 | 43 | 42 |
| 7 | 49 | 46 | 45 | 45 | 44 | 47 | 45 | 44 |
| 8 | 50 | 46 | 46 | 45 | 44 | 46 | 45 | 44 |
| 9 | 49 | 47 | 45 | 44 | 43 | 45 | 43 | 43 |
| 10 | 50 | 47 | 46 | 45 | 46 | 49 | 46 | 46 |
| 11 | 52 | 48 | 48 | 47 | 46 | 47 | 46 | 46 |
| 12 | 52 | 48 | 49 | 47 | 47 | 48 | 46 | 46 |
| 13 | 54 | 49 | 50 | 48 | 48 | 49 | 46 | 48 |
| 14 | 54 | 50 | 51 | 49 | 50 | 51 | 48 | 49 |
| 15 | 52 | 48 | 50 | 47 | 48 | 50 | 46 | 48 |
| 16 | 49 | 45 | 45 | 44 | 45 | 46 | 42 | 44 |
| 17 | 52 | 49 | 49 | 48 | 47 | 47 | 44 | 46 |
| 18 | 51 | 48 | 47 | 47 | 47 | 49 | 46 | 46 |
| 19 | 52 | 48 | 50 | 47 | 49 | 49 | 47 | 47 |
| 20 | 50 | 48 | 47 | 47 | 46 | 47 | 44 | 46 |
| 21 | 51 | 47 | 46 | 45 | 47 | 48 | 46 | 47 |
| 22 | 52 | 48 | 47 | 46 | 48 | 49 | 48 | 48 |
| 23 | 53 | 49 | 48 | 46 | 48 | 50 | 47 | 48 |
| 24 | 55 | 53 | 52 | 50 | 52 | 53 | 50 | 50 |
| 25 | 53 | 50 | 49 | 47 | 49 | 50 | 47 | 49 |
| 26 | 53 | 49 | 48 | 48 | 48 | 49 | 46 | 48 |
| 27 | 52 | 49 | 48 | 47 | 48 | 49 | 45 | 48 |
| 28 | 52 | 49 | 48 | 49 | 47 | 49 | 46 | 47 |
| 29 | 53 | 49 | 47 | 50 | 47 | 51 | 47 | 47 |
| 30 | 60 | 58 | 57 | 56 | 57 | 58 | 55 | 56 |
| 31 | 51 | 49 | 46 | 47 | 46 | 48 | 45 | 46 |
| 32 | 60 | 58 | 55 | 55 | 54 | 56 | 53 | 54 |
| 33 | 54 | 51 | 48 | 49 | 47 | 49 | 45 | 49 |
| 34 | 54 | 51 | 48 | 47 | 48 | 50 | 45 | 47 |
| 35 | 55 | 53 | 51 | 52 | 50 | 51 | 49 | 50 |
| 36 | 52 | 49 | 48 | 47 | 48 | 49 | 46 | 46 |
| 37 | 54 | 51 | 52 | 48 | 49 | 48 | 45 | 47 |

## Table 4 Chamber Relative Humidity - Mean Values (Cont'd)

| Exp Day | Relative Humidity (%)[a] | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Group 1 Chamber | | Group 2 Chamber | | Group 3 Chamber | | Group 4 Chamber | |
| | 101M | 102F | 201M | 202F | 301M | 302F | 401M | 402F |
| 38 | 39 | 36 | 34 | 34 | 34 | 34 | 32 | 33 |
| 39 | 39 | 35 | 34 | 34 | 33 | 33 | 32 | 33 |
| 40 | 61 | 58 | 56 | 55 | 56 | 55 | 54 | 55 |
| 41 | 57 | 54 | 53 | 53 | 53 | 53 | 51 | 53 |
| 42 | 54 | 50 | 49 | 49 | 47 | 48 | 45 | 47 |
| 43 | 42 | 40 | 39 | 39 | 38 | 39 | 37 | 38 |
| 44 | 38 | 35 | 33 | 33 | 33 | 34 | 33 | 33 |
| 45 | 37 | 33 | 33 | 33 | 32 | 32 | 32 | 33 |
| 46 | 39 | 36 | 35 | 35 | 34 | 35 | 34 | 35 |
| 47 | 44 | 41 | 39 | 40 | 38 | 39 | 38 | 38 |
| 48 | 48 | 45 | 42 | 43 | 41 | 42 | 40 | 40 |
| 49 | 54 | 51 | 46 | 47 | 48 | 47 | 46 | 48 |
| 50 | 48 | 46 | 43 | 44 | 44 | 44 | 43 | 44 |
| 51 | 50 | 49 | 47 | 46 | 46 | 46 | 44 | 46 |
| 52 | 58 | 58 | 58 | 57 | 61 | 60 | 52 | 55 |
| 53 | 54 | 51 | 50 | 47 | 50 | 52 | 48 | 49 |
| 54 | 57 | 55 | 54 | 52 | 54 | 54 | 50 | 51 |
| 55 | 56 | 54 | 53 | 50 | 51 | 52 | 50 | 50 |
| 56 | 53 | 54 | 53 | 52 | 53 | 53 | 52 | 53 |
| 57 | 57 | 54 | 53 | 52 | 53 | 53 | 51 | 52 |
| 58 | 48 | 45 | 44 | 43 | 46 | 45 | 41 | 42 |
| 59 | 39 | 37 | 36 | 35 | 36 | 37 | 34 | 34 |
| 60 | 54 | 52 | 50 | 49 | 50 | 51 | 46 | 48 |
| 61 | 54 | 52 | 48 | 49 | 50 | 51 | 49 | 50 |
| 62 | 60 | 59 | 55 | 53 | 55 | 56 | 53 | 56 |
| 63 | 50 | 48 | 45 | 45 | 45 | 46 | 44 | 44 |
| 64 | 46 | 42 | 41 | 41 | 41 | 41 | 40 | 40 |
| 65 | 50 | 48 | 45 | 45 | 47 | 45 | 44 | 44 |
| 66 | 55 | 51 | 52 | 50 | 51 | 52 | 50 | 51 |
| 67 | 58 | 54 | 53 | 52 | 52 | 54 | 50 | 52 |
| 68 | 60 | 58 | 55 | 53 | 55 | 55 | 53 | 55 |
| Mean | 51 | 48 | 47 | 46 | 47 | 48 | 45 | 46 |
| SD | 5.5 | 5.8 | 5.7 | 5.3 | 5.8 | 5.8 | 5.3 | 5.6 |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

**Table 5 Particle Size Analysis – Evaluation for Condensation Aerosol in Chambers**

| Exp Week | Condensation Aerosol Evaluation[a] | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Group 1 Chamber | | Group 2 Chamber | | Group 3 Chamber | | Group 4 Chamber | |
| | 101M | 102F | 201M | 202F | 301M | 302F | 401M | 402F |
| Pretest | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 1 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 2 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 3 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 4 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 5 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 6 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 7 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 8 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 9 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 10 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 11 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 12 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 13 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 14 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |

[a] Condensation aerosol within the chambers was determined as either present or absent.

## Table 6 Chamber Oxygen Level – Individual and Mean Values

| Exp Week | Oxygen (%)[a] | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Group 1 Chamber | | Group 2 Chamber | | Group 3 Chamber | | Group 4 Chamber | |
| | 101M | 102F | 201M | 202F | 301M | 302F | 401M | 402F |
| Pretest | 19.6 | 19.1 | 19.1 | 19.2 | 19.4 | 19.5 | 19.1 | 19.1 |
| 1 | 19.4 | 19.0 | 19.1 | 19.0 | 19.4 | 19.4 | 19.2 | 19.0 |
| 7 | 19.3 | 19.1 | 19.0 | 19.0 | 19.0 | 19.1 | 19.1 | 19.0 |
| 13 | 19.5 | 19.4 | 19.1 | 19.2 | 19.4 | 19.2 | 19.4 | 19.1 |
| Mean[b] | 19.4 | 19.2 | 19.1 | 19.1 | 19.3 | 19.2 | 19.2 | 19.0 |
| SD[b] | 0.10 | 0.21 | 0.12 | 0.12 | 0.23 | 0.15 | 0.15 | 0.06 |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.
[b] Excludes pretest values; on-test exposure values only.

## Table 7 Exposure Room Environmental Monitoring

| Exposure Week | Room Air Conc.[a] mg/m$^3$ | | Light Foot Candles | | Noise Decibels | |
|---|---|---|---|---|---|---|
| | Front | Back | Front | Back | Front | Back |
| Pretest | 0 | 0 | 39 | 62[b] | 65.1 | 66.3 |
| Pretest | - | - | - | 34[b] | - | - |
| 1 | 0 | 0 | 38 | 36 | 66.0 | 64.0 |
| 7 | 0 | 0 | 38 | 34 | 67.8 | 68.5 |
| 13 | 0 | 0 | 37 | 36 | 61.4 | 60.6 |
| Mean[c] | 0 | 0 | 38 | 35 | 65.1 | 64.4 |
| SD[c] | - | - | 0.6 | 1.2 | 3.30 | 4.00 |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.
[b] Light bulbs removed from light fixtures in order to better target protocol specifications. Additional pretest measurement taken.
[c] Excludes pretest values; on-test exposure values only.

# Annex 4 Ophthalmology reports

# Ophthalmology Report

Pretest

February 17, 2015

Study Director
Huntingdon Life Sciences
100 Mettlers Road
P.O. Box 2360
Somerset, NJ 08873-7378

**HLS Study Number: 14-6485**

Indirect ophthalmoscopy was performed February 17, 2015 on 208 rats. The results were recorded in the study data. All animals examined were normal.

| Animal No. | Sex | Findings |
|---|---|---|
| NA | NA | NA |

Sincerely,

[redacted]

17 Feb 15
DATE

Michael H. Brown, DVM, MS
Diplomate ACVO
Consultant Veterinary Ophthalmologist
127 South Mountain Ave
Montclair, NJ 07042
973-337-5580 h
973-890-4430 w
Muro127@aol.com

# Ophthalmology Report

Week 13

May 22, 2015

Study Director
Huntingdon Life Sciences
100 Mettlers Road
P.O. Box 2360
Somerset, NJ 08873-7378

**HLS Study Number: 14-6485**

Indirect ophthalmoscopy was performed May 22, 2015 on 200 rats. The results were recorded in the study data. Retinal degeneration is a common incidental observation in this strain.

| Animal No. | Sex | Findings |
|---|---|---|
| 1029 | M | Fundus, retinal degeneration, right, moderate |

Sincerely,

[redacted]

22May15
DATE

Michael H. Brown, DVM, MS
Diplomate ACVO
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127 South Mountain Ave
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973-337-5580 h
973-890-4430 w
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# Annex 5 Clinical pathology report

# 1. Clinical pathology

## 1.1 Hematology

There were no test substance-related hematology changes at Week 5 or the end of exposures.

All differences from controls, statistically significant or otherwise, were not considered to be test substance-related due to their direction, small magnitude, infrequent occurrence, lack of relation to exposure level, and/or because values were comparable to the study control range.

## 1.2 Coagulation

There were no test substance-related coagulation changes at the end of exposures.

All differences from controls, statistically significant or otherwise, were not considered to be test substance-related due to their direction, small magnitude, infrequent occurrence, lack of relation to exposure level, and/or because values were comparable to the study control range.

## 1.3 Clinical chemistry

There were no test substance-related clinical chemistry changes at Week 5 or the end of exposures.

All differences from controls, statistically significant or otherwise, were not considered to be test substance-related due to their direction, small magnitude, infrequent occurrence, lack of relation to exposure level, and/or because values were comparable to the study control range.

[redacted]

Lila Ramaiah, BSc, DVM, PhD, Diplomate ACVP
Senior Director, Veterinary Clinical Pathology
Envigo

22-March-2016
Date

## Annex 6 Anatomic pathology report

# PATHOLOGY REPORT

# GASOLINE ISOBUTANOL VAPOR CONDENSATE: A 13-WEEK INHALATION (WHOLE-BODY) TOXICITY STUDY IN RATS WITH NEUROTOXICITY, GENOTOXICITY AND IMMUNOTOXICITY ASSESSMENTS AND WITH A 4 WEEK RECOVERY

On 21 September 2015 the legal entity Huntingdon Life Sciences, Inc. was renamed as Envigo CRS, Inc. No other changes to the legal entity have occurred.

| | |
|---|---|
| **Envigo study number:** | 14-6485 |
| **Version ID:** | Final |
| **Issue date:** | 22 March 2016 |

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## Signature Page

### PATHOLOGY REPORT

**Gasoline Isobutanol Vapor Condensate: A 13-week Inhalation (Whole-Body) Toxicity Study in Rats with Neurotoxicity, Genotoxicity and Immunotoxicity Assessments and with a 4-week Recovery**

[redacted]

Molly H. Boyle, DVM, MPH, DACVP
Pathologist

22 Mar 16
Date

# 1. Introduction

## 1.1 Objective

This study was designed to assess the toxicity profile of Gasoline Isobutanol Vapor Condensate when administered to male and female rats via a 6-hour whole-body inhalation exposure 5 days per week for 13 weeks, and to evaluate the potential to recover from any test substance-related effects during a 4-week recovery period. Microscopic examination of recovery sacrifice animals was performed only on tissues with macroscopic findings noted at necropsy.

| Group | Treatment | Exposure Level ($mg/m^3$) | Number of animals | | | |
|---|---|---|---|---|---|---|
| | | | Main study | | Recovery Phase | |
| | | | Male | Female | Male | Female |
| 1 | Air control | 0 | 10 | 10 | 10 | 10 |
| 2 | Gasoline isobutanol vapor condensate | 2,000 | 10 | 10 | 0 | 0 |
| 3 | Gasoline isobutanol vapor condensate | 10,000 | 10 | 10 | 0 | 0 |
| 4 | Gasoline isobutanol vapor condensate | 20,000 | 10 | 10 | 10 | 10 |

# 2. Results

## 2.1 Unscheduled Decedents

All animals survived to their scheduled sacrifice.

## 2.2 Organ Weights

### 2.2.1 Terminal sacrifice

At the terminal sacrifice, gasoline isobutanol vapor condensate-related organ weight changes were not present.

### 2.2.2 Recovery sacrifice

At the recovery sacrifice, gasoline isobutanol vapor condensate-related organ weight changes were not present. In males, statistically significant lower mean absolute or relative organ weights were observed in adrenal glands and epididymides when compared to controls. In females, statistically significant higher mean absolute or relative organ weights were observed in heart and kidneys when compared to controls. These were not considered test substance-related because they were of low magnitude and/or did not occur in the terminal sacrifice rats.

## 2.3 Macropathology

### 2.3.1 Terminal sacrifice

At the terminal sacrifice, gasoline isobutanol vapor condensate-related macroscopic findings were not present.

A firm perigenital subcutaneous mass was present in 1 female rat exposed to 20,000 mg/m$^3$. This correlated microscopically to a mammary fibroadenoma. This finding was considered an incidental background finding because it was present in only one animal and is a common tumor in female rats.

All other macroscopic findings occurred sporadically or at similar incidence and severity in the control and gasoline isobutanol vapor condensate-exposed groups and were considered incidental.

### 2.3.2 Recovery sacrifice

At the recovery sacrifice, gasoline isobutanol vapor condensate-related macroscopic findings were not present.

All macroscopic findings occurred sporadically or at similar incidence and severity in the control and gasoline isobutanol vapor condensate-exposed groups and were considered incidental.

## 2.4 Histopathology

Gasoline isobutanol vapor condensate-related microscopic findings occurred in the kidneys of terminal sacrifice male rats exposed to 20,000 mg/m$^3$. Intermediate dose groups were not evaluated microscopically.

### 2.4.1 Terminal sacrifice

**Gasoline isobutanol vapor condensate-related findings**

**Kidney**

Hyaline droplet accumulation (minimal to moderate) was present in the kidneys of all male rats exposed to Gasoline Isobutanol Vapor Condensate at 20,000 mg/m$^3$. Hyaline droplet accumulation was consistent with alpha$_{2u}$-globulin nephropathy and was characterized by eosinophilic cytoplasmic droplets in the proximal tubules of the cortex, exfoliation of sporadic cells into tubular lumens, and formation of granular casts at the junction of the outer and inner stripes of the outer medulla.

Chronic progressive nephropathy (minimal to mild) was present in the kidneys of male rats exposed to Gasoline Isobutanol Vapor Condensate at 20,000 mg/m$^3$. Chronic progressive nephropathy occurred at higher incidence and greater severity in gasoline isobutanol vapor condensate-exposed rats than in control animals. This finding was characterized by basophilic proximal tubules with or without simple tubular hyperplasia. Thickened basement membranes,

tubular atrophy, tubular dilation, glomerular sclerosis, mononuclear infiltrates, and medullary hyaline casts were variably present.

**Text Table 2.4.1-1 Test substance-related findings in the kidneys of rats exposed to Gasoline Isobutanol Vapor Condensate for 13 weeks**

| Group/sex | 1M | 2M | 3M | 4M | 1F | 2F | 3F | 4F |
|---|---|---|---|---|---|---|---|---|
| Exposure level (mg/m$^3$) | 0 | 2,000 | 10,000 | 20,000 | 0 | 2,000 | 10,000 | 20,000 |
| Accumulation, hyaline droplets | | | | | | | | |
| Minimal | 0 | - | - | 1 | 0 | - | - | 0 |
| Slight | 0 | - | - | 7 | 0 | - | - | 0 |
| Moderate | 0 | - | - | 2 | 0 | - | - | 0 |
| Total | 0 | - | - | 10 | 0 | - | - | 0 |
| Nephropathy, Chronic Progressive | | | | | | | | |
| Minimal | 2 | - | - | 2 | 0 | - | - | 1 |
| Slight | 0 | - | - | 5 | 0 | - | - | 0 |
| Total | 2 | - | - | 7 | 0 | - | - | 1 |
| Number of tissues examined | 10 | 0 | 0 | 10 | 10 | 0 | 0 | 10 |

All other microscopic findings occurred sporadically or at similar incidence and severity in control and test article treated groups and were considered incidental and due to biological variability.

## 2.4.2 Recovery sacrifice

The right kidney of one 20,000 mg/m$^3$ male was examined as a result of renal depressions observed macroscopically. Non-correlating minimal hyaline droplet accumulation consistent with alpha$_{2u}$-globulin nephropathy and minimal chronic progressive nephropathy were observed in this animal.

# 3. Pathologist's Comments

Inhalation exposure to Gasoline Isobutanol Vapor Condensate at 2,000, 10,000, and 20,000 mg/m$^3$ for 13 weeks with a 4 week recovery period was associated with accumulation of hyaline droplets consistent with alpha$_{2u}$-globulin nephropathy and chronic progressive nephropathy in terminal sacrifice males dosed at 20,000 mg/m$^3$.

Alpha$_{2u}$-globulin nephropathy in rats is a known effect of exposure to unleaded gasoline (Halder *et. al.*, 1985; Short *et. al.*, 1989; Swenberg, 1993). This finding is specific to male rats and is not considered relevant to human risk assessment. Exacerbation of spontaneous chronic progressive nephropathy is frequently reported with alpha$_{2u}$-globulin nephropathy. Alpha$_{2u}$-globulin nephropathy in male rats has also been associated with an increased incidence of renal tumors due to sustained proliferative effects secondary to overload-associated cellular loss. It is unnecessary to routinely use special histochemical stains for hyaline droplets to make the diagnosis of alpha$_{2u}$-globulin nephropathy. Special stains are most useful when there are unusual presentations, such as incidence in females or abnormal histologic features of the droplets, neither of which were present in this study (Frazier *et. al.*, 2012).

These findings were considered adverse due to their clinical significance resulting in expectation for functional deficits and the potential to reduce the organism's ability to respond to an additional environmental challenge (Lewis *et. al.*, 2002).

# 4. References

Halder, C.A., Holdsworth, C.E., Cockrell, B.Y., Piccirillo, V.J. 1985. Hydrocarbon nephropathy in male rats: identification of the nephrotoxic components of unleaded gasoline. *Toxicol Ind Health.* 1(3):67–87.

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# Annex 7 Micronucleus report

# Micronucleus Analysis Report

# Gasoline Isobutanol Vapor Condensate: A 13-Week Inhalation (Whole-Body) Toxicity Study In Rats With Neurotoxicity, Genotoxicity And Immunotoxicity Assessments And With A 4 Week Recovery

On 21 September 2015 the legal entity Huntingdon Life Sciences Limited was renamed as Envigo CRS Limited. No other changes to the legal entity have occurred.

| | |
|---|---|
| **Envigo study number:** | 14-6485 |
| **Test site reference number:** | HUD0444 |
| **Version ID:** | Final Report |
| **Issue date:** | 17 March 2016 |

# Sponsor and Test Site Details

**Sponsor**

Butamax Advanced Biofuels, LLC
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Envigo CRS Limited
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Envigo Test Site Reference Number: HUD0444
Envigo Study Number: 14-6485

# Compliance with Good Laboratory Practice

## Gasoline Isobutanol Vapor Condensate: A 13-week Inhalation (Whole-Body) Toxicity Study In Rats With Neurotoxicity, Genotoxicity And Immunotoxicity Assessments And With A 4 Week Recovery - Micronucleus phase

The phase of the study described in this report was conducted in compliance with the following Good Laboratory Practice and I consider the data generated to be valid.

The UK Good Laboratory Practice Regulations (Statutory Instrument 1999 No. 3106, as amended by Statutory Instrument 2004 No. 994).

OECD Principles of Good Laboratory Practice (as revised in 1997), ENV/MC/CHEM (98) 17.

EC Commission Directive 2004/10/EC of 11 February 2004 (Official Journal No L 50/44).

These principles of Good Laboratory Practice are accepted by the regulatory authorities of the United States of America and Japan on the basis of intergovernmental agreements.

[redacted]

17 March 2016

William Barfield BSc (Hons) MSc CBiol MSB
Principal Investigator
Envigo

Date

Envigo Test Site Reference Number: HUD0444
Envigo Study Number: 14-6485

# Quality Assurance Statement

## Gasoline Isobutanol Vapor Condensate: A 13-week Inhalation (Whole-Body) Toxicity Study In Rats With Neurotoxicity, Genotoxicity And Immunotoxicity Assessments And With A 4 Week Recovery - Micronucleus phase

The following inspections and audits have been carried out in relation to the phase of the study conducted at Envigo:

| Study Phase | Date(s) of Inspection | Date of Reporting to Principal Investigator and Test Site Management | Date of Reporting to Study Director, Test Facility Management and Lead QA |
|---|---|---|---|
| Protocol Audit and Protocol Amendment No. 1 | 03 Mar 2015 | 03 Mar 2015 | 16 Mar 2015 |
| Protocol Amendment No. 3 | 10 Jun 2015 | 10 Jun 2015 | 10 Jun 2015 |
| Protocol Amendment No. 4 | 07 Jul 2015 | 07 Jul 2015 | 07 Jul 2015 |
| Phase Report Audit | 12 Aug 2015 | 14 Aug 2015 | 14 Aug 2015 |

**Process based inspections**: At or about the time this phase of the study was in progress inspections of procedures employed on this type of study phase were carried out. These were conducted and reported to appropriate Company Management as indicated below:

| Process Based Inspections | Date(s) of Inspection | Date of Reporting to Test Site Management |
|---|---|---|
| Slide staining and reading | 08 Apr 2015 | 09 Apr 2015 |

In addition, an inspection of the facility where this phase of the study was conducted was carried out on an annual basis. These inspections were reported to Company Management.

[redacted]

10 March 2016

Allan T Drummond, MRQA
Lead Auditor
Department of Quality Assurance,
Envigo

Date

# Contributing Scientists

## Gasoline Isobutanol Vapor Condensate: A 13-week Inhalation (Whole-Body) Toxicity Study In Rats With Neurotoxicity, Genotoxicity And Immunotoxicity Assessments And With A 4 Week Recovery - Micronucleus phase

### Cell and Molecular Sciences

William Barfield BSc (Hons) MSc CBiol MSB
Principal Investigator

Elizabeth Watling BSc (Hons)
Trainee Study Manager

### Statistics

Anastasiia Raievska MSc
Statistician

# Summary

This phase of the study was designed to assess the potential induction of micronuclei by Gasoline Isobutanol Vapor Condensate in bone marrow cells of male and female Crl:CD(SD) IGS Rats following 4 weeks of treatment.

Bone marrow smears were obtained from animals in the air control group, positive control group and in each of the test substance groups on the day after administration of the final exposure.

At least one smear from each animal was examined for the presence of micronuclei in 4000 polychromatic erythrocytes. The proportion of polychromatic erythrocytes was assessed by examination of at least 1000 erythrocytes from each animal. A record of the incidence of micronucleated normochromatic erythrocytes was also kept.

### Results

A statistically significantly increase in the frequency of micronucleated polychromatic erythrocytes was observed in male Crl:CD(SD) IGS rats treated with Gasoline Isobutanol Vapor Condensate at 2000mg/m$^3$ only, compared to air control values ($p<0.05$). Individual values for %MPCE are within the current vehicle historical control range and therefore the statistically significant increase is not considered to be biologically significant. There was no statistically significant decreases in the proportion of polychromatic erythrocytes observed in male Crl:CD(SD) IGS rats treated with Gasoline Isobutanol Vapor Condensate at any treatment level, compared to air control values.

No statistically significant increases in the frequency of micronucleated polychromatic erythrocytes and no statistically significant decreases in the proportion of polychromatic erythrocytes were observed in female Crl:CD(SD) IGS rats administered Gasoline Isobutanol Vapor Condensate at any treatment level, compared to air control values.

The positive control compound, Cyclophosphamide, produced a statistically significant increase in the frequency of micronucleated polychromatic erythrocytes ($p<0.01$ male and female animals) and a statistically significant decrease in the proportion of polychromatic erythrocytes ($p<0.05$ male animals only).

### Conclusion

It is concluded that Gasoline Isobutanol Vapor Condensate did not show any evidence of causing an increase in the induction of micronucleated polychromatic erythrocytes or bone marrow cell toxicity in male or female Crl:CD(SD) IGS rats when administered by inhalation exposure in this in vivo test procedure.

# 1. Introduction

## 1.1 Objective

The purpose of this study phase was to assess the potential of Gasoline Isobutanol Vapor Condensate to induce an increase in the induction of micronucleated polychromatic erythrocytes in Crl:CD(SD) IGS rats following inhalation administration using an in vivo cytogenetic system (Boller and Schmid 1970, MacGregor et al, 1987, Mavournin et al, 1990).

## 1.2 Regulatory compliance

The performance of this study was in compliance with the following Guidelines:

OECD Guideline for the Testing of Chemicals. (1997) Genetic Toxicology: Mammalian Erythrocyte Micronucleus Test, Guideline 474.

EC Commission Regulation No. 440/2008. Method B.12: Mutagenicity - In vivo Mammalian Erythrocyte Micronucleus Test. OJ L 142/240.

ICH (2011) EMA/CHMP/ICH/126642/2008. Guideline S2(R1): Guidance on Genotoxicity Testing and Data Interpretation for Pharmaceuticals Intended for Human Use

## 1.3 Study phase dates

Phase start:

(Slides received) 02 April 2015

Phase completion: 17 April 2015

# 2. Experimental Procedure

## 2.1 Micronucleus test

On completion of the 4 week treatment period five male and five female rats from the air control and test substance groups were sampled for bone marrow.

The experimental design is shown below:

| Group | Treatment | Exposure/Dosage | Number of animals | |
|---|---|---|---|---|
| | | | Males | Females |
| 1 | Air Control | 0 mg/m$^3$ | 5 | 5 |
| 2 | Gasoline Isobutanol Vapor Condensate | 2,000 mg/m$^3$ | 5 | 5 |
| 3 | Gasoline Isobutanol Vapor Condensate | 10,000 mg/m$^3$ | 5 | 5 |
| 4 | Gasoline Isobutanol Vapor Condensate | 20,000 mg/m$^3$ | 5 | 5 |
| 5 | Cyclophosphamide | 20 mg/kg | 5 | 5 |

## 2.2 Fixation and slide staining

Upon receipt at the Test Site, slides were stained with acridine orange using the following procedure:

1 Rinsed in purified water

2 Stained in acridine orange solution (0.0125 mg/mL using purified water) for 4 minutes

3 Washed in purified water for 5 minutes

4 Rinsed in cold tap water for 2 minutes

5 Stored at room temperature until required

6 Immediately prior to scoring, slides are wet mounted with coverslips using purified water

## 2.3 Microscopic examination

Coded slides were examined by fluorescence microscopy and 4000 polychromatic erythrocytes per animal were examined for the presence of micronuclei. At least one smear was examined per animal, any remaining smears being held temporarily in reserve in case of technical problems with the first smear.

The proportion of polychromatic erythrocytes was assessed by examination of a total of at least 1000 erythrocytes per animal and the number of micronucleated normochromatic erythrocytes was recorded.

# 3. Assessment of Results

## 3.1 Acceptance criteria

The following criteria will be applied for assessment of assay acceptability:

The concurrent negative control is considered acceptable for addition to the laboratory historical negative control database, ideally within 95% confidence limits.

Concurrent positive control or scoring controls should induce responses that are compatible with those generated in the historical positive control database and produce a statistically significant increase compared with the concurrent negative control.

A maximum tolerated dose or maximum feasible dose has been achieved.

Adequate number of cells and doses have been analysed.

Each treated and control group should include at least 5 analysable animals.

## 3.2 Analysis of data

Each sex was analysed separately.

For the proportion of polychromatic erythrocytes, an asymptotic one-tailed Jonckheere's test for trend (Jonckheere 1954) with "step-down" was used on Groups 1 to 4 for a decrease from control. If significant, then the analysis was carried out on Groups 1 to 3. Exact one-tailed Wilcoxon pairwise tests (Wilcoxon 1945), for a decrease from control, were also carried out on Group 1 (control) versus Groups 2, 3, 4 and 5.

For incidences of micronucleated polychromatic erythrocytes, an exact one-tailed Linear-by-Linear association test (Cytel 1995) with "step-down" was used on Groups 1 to 4 for an increase from control. If significant, then the analysis was carried out on Groups 1 to 3. Exact one-tailed pairwise Permutation tests (Cytel 1995), for an increase from control, were also carried out on Group 1 (control) versus Groups 2, 3, 4 and 5.

If the exact version of a test could not be calculated (due to the amount of data), then the asymptotic version was used instead.

Statistical significance was declared at the 5% level for all tests.

The data were received in an Excel document and analysed using SAS 9.1.3 (SAS Institute Inc., 2002) (Jonckheere's and Wilcoxon tests) and StatXact 3 (Cytel 1995) (Linear-by-Linear and Permutation tests).

## 3.3 Evaluation and Interpretation of Results

Providing that all acceptability criteria are fulfilled, a test chemical is considered clearly negative if, in all experimental conditions examined:

a) None of the treatment groups exhibits a statistically significant increase in the frequency of micronucleated polychromatic erythrocytes compared with the concurrent negative control, b) There is no dose-related increase at any sampling time when evaluated by an appropriate trend test, c) All results are inside the distribution of the historical negative control data (e.g. Poisson-based 95% control limits), and d) Bone marrow exposure to the test substance(s) occurred.

Evidence of exposure of the bone marrow to a test substance may include a depression of the polychromatic to normochromatic erythrocyte ratio or measurement of the plasma or blood levels of the test substance. In case of intravenous administration, evidence of exposure is not needed. Alternatively, ADME data, obtained in an independent study using the same route and same species can be used to demonstrate bone marrow exposure. Negative results indicate that, under the test conditions, the test chemical does not produce micronuclei in the polychromatic erythrocytes of the test species.

Providing that all acceptability criteria are fulfilled, a test chemical is considered clearly positive if:

a) At least one of the treatment groups exhibits a statistically significant increase in the frequency of micronucleated polychromatic erythrocytes compared with the concurrent negative control, b) This increase is dose-related at least at one sampling time when evaluated with an appropriate trend test, and c) Any of these results are outside the distribution of the historical negative control data (e.g. Poisson-based 95% control limits).

When conducting a dose-response analysis, at least three treated dose groups should be analysed. Statistical tests should use the animal as the experimental unit. Positive results in the micronucleus test indicate that a test chemical induces micronuclei, which are the result of chromosomal damage or damage to the mitotic apparatus in the erythroblasts of the test species.

There is no requirement for verification of a clear positive or clear negative response.

In cases where the response is not clearly negative or positive and in order to assist in establishing the biological relevance of a result (e.g. a weak or borderline increase), the data should be evaluated by expert judgement and/or further investigations of the existing experiments completed. In some cases, analysing more cells or performing a repeat experiment using modified experimental conditions could be useful.

In rare cases, even after further investigations, the data will preclude making a conclusion that the test chemical produces either positive or negative results, and the study will therefore be concluded as equivocal.

# 4. Computer Systems

| | |
|---|---|
| Statistics: | SAS<br>StatXact |

All version numbers of the systems are maintained by Envigo, Huntingdon Test Site.

# 5. Archiving

The data generated by the Principal Investigators as well as the original signed report(s) will be transferred to the Testing Facility for archiving. Electronic raw data generated by Envigo-UK will be maintained by the Test Site in accordance with their GLP archiving procedures. In addition, Envigo-UK will retain the Quality Assurance records relevant to this study in its archive at Envigo for a period of 20 years.

# 6. Results

The historical control data are summarised in Annex 1

## 6.1 Micronucleus test

The micronucleus test was carried out in male and female animals.

Table 1 gives a summary of the results of the micronucleus test and the results of statistical analysis. The results for individual animals are presented in Table 2.

### 6.1.1 Micronucleated polychromatic erythrocyte counts (MPCE)

A statistically significantly increase in the frequency of micronucleated polychromatic erythrocytes was observed in male Crl:CD(SD) IGS rats treated with Gasoline Isobutanol Vapor Condensate at 2000mg/m$^3$ only, compared to air control values ($p<0.05$). Individual values for %MPCE are within the current vehicle historical control range and therefore the statistically significant increase is not considered to be biologically significant. There was no statistically significant decreases in the proportion of polychromatic erythrocytes observed in male Crl:CD(SD) IGS rats treated with Gasoline Isobutanol Vapor Condensate at any treatment level, compared to air control values.

No statistically significant increases in the frequency of micronucleated polychromatic erythrocytes and no statistically significant decreases in the proportion of polychromatic erythrocytes were observed in female Crl:CD(SD) IGS rats administered Gasoline Isobutanol Vapor Condensate at any treatment level, compared to air control values.

Cyclophosphamide caused a statistically significant increases in the frequency of micronucleated polychromatic erythrocytes ($p<0.01$) in male and female Crl:CD(SD) IGS rats.

### 6.1.2 Micronucleated normochromatic erythrocytes (MNCE)

Gasoline Isobutanol Vapor Condensate did not cause any significant increases in the incidence of micronucleated normochromatic erythrocytes in male or female Crl:CD(SD) IGS rats.

### 6.1.3 Proportion of polychromatic erythrocytes (%PCE)

Gasoline Isobutanol Vapor Condensate did not cause any statistically significant decreases in the proportion of polychromatic erythrocytes in male or female Crl:CD(SD) IGS rats.

Cyclophosphamide did cause a statistically significant decrease in the proportion of polychromatic erythrocytes in male Crl:CD(SD) IGS rats.

# 7. Conclusion

It is concluded that Gasoline Isobutanol Vapor Condensate did not show any evidence of causing an increase in the induction of micronucleated polychromatic erythrocytes or bone marrow cell toxicity in male or female Crl:CD(SD) IGS rats when administered by inhalation exposure in this in vivo test procedure.

# 8. References

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Wilcoxon, F. (1945). Individual comparisons by ranking methods. Biometrics Bulletin, 1, 80-83.

**Table 1 Summary of results and statistical analysis**

| Male data | | | | |
|---|---|---|---|---|
| Treatment | **Exposure/Dosage** | Proportion of PCE % # (SD) | Incidence MPCE mean # (SD) | Group mean % MPCE # |
| Air Control | 0 mg/m$^3$ | 51.3 (1.5) | 3.6 (1.9) | 0.09 |
| Gasoline Isobutanol Vapor Condensate | 2,000 mg/m$^3$ | 48.9 (2.0) | 7.6* (3.0) | 0.19 |
| Gasoline Isobutanol Vapor Condensate | 10,000 mg/m$^3$ | 51.4 (0.6) | 6.8 (3.6) | 0.17 |
| Gasoline Isobutanol Vapor Condensate | 20,000 mg/m$^3$ | 50.0 (3.8) | 4.6 (2.3) | 0.12 |
| Cyclophosphamide | 20 mg/kg | 44.2* (6.6) | 43.4** (16.3) | 1.09 |
| **Female data** | | | | |
| Treatment | **Exposure/Dosage** | Proportion of PCE % # (SD) | Incidence MPCE mean # (SD) | Group mean % MPCE # |
| Air Control | 0 mg/m$^3$ | 49.1 (2.4) | 7.4 (1.8) | 0.19 |
| Gasoline Isobutanol Vapor Condensate | 2,000 mg/m$^3$ | 52.2 (2.4) | 7.0 (5.1) | 0.18 |
| Gasoline Isobutanol Vapor Condensate | 10,000 mg/m$^3$ | 51.3 (0.9) | 4.4 (2.9) | 0.11 |
| Gasoline Isobutanol Vapor Condensate | 20,000 mg/m$^3$ | 49.2 (3.1) | 3.8 (1.9) | 0.10 |
| Cyclophosphamide | 20 mg/kg | 45.2 (2.8) | 57.4** (5.3) | 1.44 |

PCE Polychromatic erythrocytes

MPCE Number of micronucleated polychromatic erythrocytes observed per 4000 polychromatic erythrocytes examined

SD Standard deviation

# Occasional apparent errors of ± 1% may occur due to rounding of values for presentation in the table.

Results of statistical analysis using the appropriate nonparametric method of analysis based on permutation (one-sided probabilities):

* $p < 0.05$ (significant)

** $p < 0.01$ (significant)

otherwise $p > 0.05$ (not significant)

**Table 2 Individual animal data**

**Male data**

**Results for individual animals - 24 hour sampling time**

| Treatment | Animal number | Proportion PCE (%) | MPCE (%) | PCE | NCE | MNCE |
|---|---|---|---|---|---|---|
| Air Control (0 mg/m$^3$) | 1031 | 50.3 | 5 (0.13) | 554 | 548 | 0 |
| | 1032 | 53.8 | 2 (0.05) | 550 | 472 | 0 |
| | 1033 | 50.0 | 5 (0.13) | 501 | 501 | 0 |
| | 1034 | 51.0 | 1 (0.03) | 819 | 787 | 0 |
| | 1035 | 51.5 | 5 (0.13) | 561 | 528 | 0 |
| Gasoline Isobutanol Vapor Condensate (2,000 mg/m$^3$) | 2031 | 46.4 | 5 (0.13) | 495 | 572 | 1 |
| | 2032 | 48.2 | 4 (0.10) | 735 | 791 | 0 |
| | 2033 | 48.1 | 8 (0.20) | 508 | 549 | 1 |
| | 2034 | 51.1 | 10 (0.25) | 594 | 568 | 0 |
| | 2035 | 50.8 | 11 (0.28) | 543 | 526 | 1 |
| Gasoline Isobutanol Vapor Condensate (10,000 mg/m$^3$) | 3031 | 51.5 | 1 (0.03) | 519 | 489 | 0 |
| | 3032 | 51.2 | 10 (0.25) | 537 | 512 | 0 |
| | 3033 | 50.7 | 6 (0.15) | 591 | 575 | 0 |
| | 3034 | 52.3 | 8 (0.20) | 560 | 510 | 0 |
| | 3035 | 51.4 | 9 (0.23) | 539 | 510 | 0 |
| Gasoline Isobutanol Vapor Condensate (20,000 mg/m$^3$) | 4031 | 53.6 | 4 (0.10) | 546 | 472 | 0 |
| | 4032 | 44.8 | 5 (0.13) | 500 | 616 | 0 |
| | 4033 | 48.0 | 1 (0.03) | 486 | 527 | 0 |
| | 4034 | 53.5 | 7 (0.18) | 601 | 522 | 0 |
| | 4035 | 50.2 | 6 (0.15) | 536 | 532 | 0 |
| Cyclophosphamide (20 mg/kg) | 5031 | 40.4 | 46 (1.15) | 415 | 613 | 0 |
| | 5032 | 49.6 | 70 (1.75) | 649 | 660 | 0 |
| | 5033 | 53.0 | 40 (1.00) | 571 | 507 | 1 |
| | 5034 | 38.9 | 31 (0.78) | 424 | 665 | 0 |
| | 5035 | 39.2 | 30 (0.75) | 402 | 623 | 2 |

PCE Number of polychromatic erythrocytes per 1000 erythrocytes
MPCE Number of micronucleated cells observed per 4000 polychromatic erythrocytes examined
NCE Total number of normochromatic erythrocytes examined for micronuclei
MNCE Number of micronucleated normochromatic erythrocytes observed

**Table 2 Individual animal data – continued**

**Female data**

**Results for individual animals - 24 hour sampling time**

| Treatment | Animal number | Proportion PCE (%) | MPCE (%) | PCE | NCE | MNCE |
|---|---|---|---|---|---|---|
| Air Control (0 mg/m$^3$) | 1531 | 49.7 | 10 (0.25) | 639 | 646 | 0 |
| | 1532 | 46.4 | 8 (0.20) | 471 | 545 | 0 |
| | 1533 | 46.9 | 7 (0.18) | 530 | 600 | 0 |
| | 1534 | 50.9 | 7 (0.18) | 545 | 526 | 0 |
| | 1535 | 51.8 | 5 (0.13) | 532 | 495 | 0 |
| Gasoline Isobutanol Vapor Condensate (2,000 mg/m$^3$) | 2531 | 51.0 | 3 (0.08) | 532 | 512 | 0 |
| | 2532 | 53.0 | 2 (0.05) | 714 | 632 | 0 |
| | 2533 | 55.5 | 15 (0.38) | 817 | 654 | 0 |
| | 2534 | 49.0 | 8 (0.20) | 505 | 526 | 0 |
| | 2535 | 52.2 | 7 (0.18) | 618 | 565 | 0 |
| Gasoline Isobutanol Vapor Condensate (10,000 mg/m$^3$) | 3531 | 50.4 | 1 (0.03) | 783 | 772 | 0 |
| | 3532 | 52.0 | 2 (0.05) | 568 | 525 | 0 |
| | 3533 | 52.4 | 5 (0.13) | 560 | 509 | 0 |
| | 3534 | 51.3 | 6 (0.15) | 552 | 525 | 0 |
| | 3535 | 50.4 | 8 (0.20) | 545 | 537 | 1 |
| Gasoline Isobutanol Vapor Condensate (20,000 mg/m$^3$) | 4531 | 44.3 | 5 (0.13) | 532 | 668 | 0 |
| | 4532 | 50.0 | 6 (0.15) | 512 | 512 | 1 |
| | 4533 | 52.8 | 4 (0.10) | 547 | 489 | 0 |
| | 4534 | 49.0 | 1 (0.03) | 517 | 538 | 0 |
| | 4535 | 49.9 | 3 (0.08) | 541 | 544 | 1 |
| Cyclophosphamide (20 mg/kg) | 5531 | 46.6 | 52 (1.30) | 517 | 592 | 0 |
| | 5532 | 41.1 | 52 (1.30) | 457 | 656 | 1 |
| | 5533 | 47.0 | 63 (1.58) | 555 | 627 | 0 |
| | 5534 | 43.6 | 58 (1.45) | 555 | 718 | 0 |
| | 5535 | 47.6 | 62 (1.55) | 514 | 566 | 1 |

PCE Number of polychromatic erythrocytes per 1000 erythrocytes
MPCE Number of micronucleated cells observed per 4000 polychromatic erythrocytes examined
NCE Total number of normochromatic erythrocytes examined for micronuclei
MNCE Number of micronucleated normochromatic erythrocytes observed

## Annex 1 Historical control data

**Sprague Dawley Rat Bolt on Historical Control Data PRC**

**Vehicle Control Values – Nov-12 – Mar-15**

**5 Studies**

**Proportion of Polychromatic Erythrocytes (% PCE)**

| | Individual | Group |
|---|---|---|
| Minimum | 31.2 | 40.5 |
| Maximum | 63.7 | 50.9 |
| Mean | 46.9 | 46.9 |
| Standard Deviation | 7.5 | 4.9 |
| Upper 95% Cl | 58.1 | 50.9 |
| Lower 95% Cl | 35.3 | 40.9 |

**Percentage of Micronucleated Polychromatic Erythrocytes (MPCE)**

| | Individual | Group |
|---|---|---|
| Minimum | 0.00 | 0.04 |
| Maximum | 0.40 | 0.16 |
| Mean | 0.08 | 0.08 |
| Standard Deviation | 0.08 | 0.05 |
| Upper 95% Cl | 0.20 | 0.15 |
| Lower 95% Cl | 0.00 | 0.04 |

## Annex 2 GLP Compliance statement

Envigo Test Site Reference Number: HUD0444
Envigo Study Number: 14-6485

DH Department of Health

# THE DEPARTMENT OF HEALTH OF THE GOVERNMENT OF THE UNITED KINGDOM

## GOOD LABORATORY PRACTICE

## STATEMENT OF COMPLIANCE IN ACCORDANCE WITH DIRECTIVE 2004/9/EC

**TEST FACILITY**

**Envigo CRS Limited - Huntingdon**
**Woolley Road**
**Alconbury**
**Cambs.**
**PE28 4HS**

**TEST TYPE(S)**

**Analytical/Clinical Chemistry**
**Environmental Fate**
**Environmental Toxicity**
**Ecosystems**
**Phys.Chem. Testing**
**Mutagenicity**
**Toxicology**

**DATE OF INSPECTION** **25 to 27 November 2015**

An inspection for compliance with the Principles of Good Laboratory Practice was carried out at the above test facility as part of the UK Good Laboratory Practice Compliance Monitoring Programme.

This statement confirms that, on the date of issue, the UK Good Laboratory Practice Monitoring Authority were satisfied that the above test facility was operating in compliance with the OECD Principles of Good Laboratory Practice.

This statement constitutes a Good Laboratory Practice Instrument (as defined in the UK Good Laboratory Practice Regulations 1999).

[redacted]
15/2/16

**Dr. Andrew J. Gray**
**Head, UK GLP Monitoring Authority**

MHRA

# Annex 8 Immunotoxicity report

# *FINAL REPORT*

## *Immunological Evaluation of Gasoline Isobutanol Vapor Condensate in Female Crl:CD(SD) CD® IGS Rats Using the Plaque Forming Cell Assay*

| | |
|---|---|
| *Test Substance:* | Gasoline Isobutanol Vapor Condensate |
| *Protocol No:* | 14-6485 |
| *Subcontractor's Sponsor:* | Envigo<br>P.O. Box 2360<br>East Millstone, NJ 08875-2360<br>Phone: (732) 873-2550 ext 2920<br>Fax: (732) 873-3992<br>Email: gary.hoffmang@envigo.com |
| *Study Director:* | Gary M. Hoffman, B.A., DABT |
| *Sponsor:* | Butamax Advanced Biofuels, LLC<br>200 Powder Mill Road<br>E356 Third Floor<br>Wilmington, DE 19880-0356 |
| *Sponsor's Representative:* | James Baustian<br>Fuel Products Manager |
| *Date:* | 17 March 2016 |
| *Principal Investigator:* | Karen M. Carter, Ph.D.<br>Director, ImmunoTox |
| Final Report Reviewed by: | Amanda D. Miller, Ph.D.<br>Director, Biological Chemistries<br>Email: admiller@aibiotech.com<br><br>Theon Loving<br>QA Auditor<br>Email: tloving@aibiotech.com |
| *Plaque Forming Cell Assay Conducted at.* | ImmunoTox®, A Division of AIBioTech<br>601 Biotech Drive<br>Richmond, VA 23235<br>Phone: 804-648-3820<br>Fax: 804-977-5038 |

ImmunoTox® A Division of AIBioTech®, LLC

## I. GLP COMPLIANCE STATEMENT

This study was conducted in compliance with EPA Good Laboratory Practices as set forth in 79.60, CFR Vol. 59, No. 122, 27 June 1994 with the following exceptions:

The identity, strength, purity and composition or other characteristics to define the positive control article have not been determined by the Testing Facility. The positive control article has been characterized as per the Certificate of Analysis on file with the Testing Facility. The stability of the positive control article has not been determined by the Testing Facility. Analyses to determine the uniformity (as applicable) or concentration of the positive control mixture were not performed by the Testing Facility. The stability of the positive control article mixture has not been determined by the Testing Facility.

[redacted]

March 17, 2016
Date

Amanda D. Miller, Ph.D.*
Director, Biological Chemistries
AI BioTech, LLC

* Vanessa Peachee, Ph.D. was responsible for the GLP compliance but due to her departure from the company and the subsequent departure from the company of her replacement (Karen M. Carter, Ph.D.), management (Amanda D. Miller, Ph.D.*) is responsible for signing this report.

## II. QUALITY ASSURANCE STATEMENT

Test Substance: Gasoline Isobutanol Vapor Condensate

Report Title: Immunological Evaluation of Gasoline Isobutanol Vapor Condensate in Female Crl:CD(SD) CD® IGS Rats Using the Plaque Forming Cell Assay

Protocol Title: Gasoline Isobutanol Vapor Condensate: A 13-Week Inhalation (Whole-Body) Toxicity Study in Rats with Neurotoxicity, Genotoxicity and Immunotoxicity Assessments and with a 4 Week Recovery

Protocol No.: 14-6485

The final report for the indicated protocol has been reviewed by the Quality Assurance Unit of AIBioTech. Furthermore, the Quality Assurance Unit has conducted the following inspections and reported to the ImmunoTox®, A Division of AIBioTech Principal Investigator, and then has submitted written reports of said inspections to the Study Director and Management.

Audits were performed and reported on the following dates:

| Performed | Reported to ImmunoTox's Principal Investigator and Study Director | Reported to AIB's Management | Activity |
|---|---|---|---|
| 21 April 2015 | 20 May 2015 | 20 May 2015 | sRBC Preparation |
| 18-20 May 2015 | 20 May 2015 | 20 May 2015 | Data Audit |
| 18-20 May 2015 | 20 May 2015 | 20 May 2015 | Report Audit |

Approved and Submitted by: [redacted]
Theon Loving
QA Specialist-GLP, AIBioTech

3-17-16
Date

## III. SIGNATURE OF PRINCIPALS

This report describes the results used to evaluate the relative immunotoxicological potential of the test substance, Gasoline Isobutanol Vapor Condensate, which was administered by inhalation via whole-body exposure to female Crl:CD(SD) CD® IGS rats.

Vanessa L. Peachee, Ph.D., Principal Investigator was responsible for the overall conduct of the immunotoxicity evaluations in this study. She is no longer employed with ImmunoTox®, A Division of AIBioTech, and as such, is unavailable to sign this report.

The final report has been reviewed by AI BioTech:

[redacted]

Amanda D. Miller, Ph.D.*
Director, Biological Chemistries
AI BioTech, LLC

March 17, 2016
Date

* Vanessa Peachee, Ph.D. was responsible for the report and interpretation but due to her departure from the company and the subsequent departure from the company of her replacement (Karen M. Carter, Ph.D.), management (Amanda D. Miller, Ph.D.*) is responsible for signing this report.

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## IV. EXECUTIVE SUMMARY

The study was conducted as part of Envigo (ENVIGO) Study No. 14-6485 at ImmunoTox®, A Division of AIBioTech (ImmunoTox), Richmond, Virginia. The Principal Investigator was initially Vanessa L. Peachee, Ph.D. The study was conducted to provide evaluation of immunological parameters for ENVIGO.

The objective of the study was to determine the potential effects of Gasoline Isobutanol Vapor Condensate for its ability to affect the humoral immune component of the immune system, when evaluated in the antibody-forming cell response to the T-dependent antigen, sheep erythrocytes. Female Crl:CD(SD) CD® IGS rats were administered Gasoline Isobutanol Vapor Condensate for 5 days per week for 4 weeks by inhalation via whole body exposure by ENVIGO personnel. Three exposure levels of 2,000, 10,000 and 20,000 mg/m$^3$ of the test substance were used in the study. The in-life phase of the study was conducted by ENVIGO, East Millstone, NJ, and the immunological evaluation was conducted by ImmunoTox, Richmond, VA. On the day of euthanasia, spleens were placed in tubes containing media, placed on ice, and shipped to ImmunoTox for assay evaluation on the following day.

Executive Summary Table ES-1 shows a summary of the selected toxicology and immunology parameters evaluated. Exposure to Gasoline Isobutanol Vapor Condensate resulted in no statistically significant changes in terminal body weight for any exposure level. Furthermore, there were no statistically significant effects observed in either thymus or spleen weight following exposure to Gasoline Isobutanol Vapor Condensate, when evaluated as either absolute or relative (% body weight) weights, as compared to the air control.

Exposure to Gasoline Isobutanol Vapor Condensate resulted in no effects in spleen cell number or in the IgM antibody-forming cell (AFC) response to the T-dependent antigen, sheep erythrocytes, when evaluated as either Specific Activity (AFC/10$^6$ Spleen Cells) or as Total Spleen Activity (AFC/Spleen). The positive control, cyclophosphamide (CPS), produced the anticipated results in the various parameters evaluated.

In conclusion, the results of this immunotoxicological evaluation demonstrate that, under the experimental conditions used, exposure to the Gasoline Isobutanol Vapor Condensate test substance did not adversely affected the functional ability of the humoral immune component of the immune system. Therefore, based on this study, the No Observed Adverse Effect Level (NOAEL) was 20,000 mg/m$^3$.

Table ES-1

SUMMARY TABLE FOR TOXICOLOGY AND IMMUNOLOGY STUDIES

| Parameter | Result | Maximum Effect | Exposure Level ($mg/m^3$) |
|---|---|---|---|
| **Terminal Body Weight** | | | |
| Day 29 | No Effect | | |
| **Organ Weights (Absolute and Relative)** | | | |
| Spleen (Absolute) | No Effect | | |
| Spleen (Relative) | No Effect | | |
| Thymus (Absolute) | No Effect | | |
| Thymus (Relative) | No Effect | | |
| **Spleen IgM Antibody-Forming Cell Response to Sheep Erythrocytes** | | | |
| Spleen Cell Number | No Effect | | |
| IgM AFC/$10^6$ Spleen Cells | No Effect | | |
| IgM AFC/Spleen ($x10^3$) | No Effect | | |

## V. INTRODUCTION

The purpose of this study was to provide evaluation of immunological parameters for ENVIGO Study No. 14-6485. In this study, the test substance, Gasoline Isobutanol Vapor Condensate, was evaluated for its ability to affect the humoral immune component of the immune system, when evaluated in the antibody-forming cell response to the T-dependent antigen sheep erythrocytes. The study was conducted in female animals because female rats have a more robust immune response than do the male animal of the species. Accordingly, female rats have a greater sensitivity for detecting an adverse effect of a compound should one occur. Routinely, immunotoxicology evaluations conducted by the National Toxicology Program (NTP) evaluate compounds only in female animals. Four days prior to euthanasia, ImmunoTox personnel sensitized the rats by intravenous administration of sheep erythrocytes at the ENVIGO facility. On the day of euthanasia, ENVIGO personnel aseptically removed the spleen from each animal. The spleens were weighed, placed in tubes containing media, and sent to ImmunoTox, Richmond, VA, on ice for evaluation the following day. Spleens were received on 01 May 2015 and the immunological evaluation was conducted on the same day. The IgM AFC response to the T-dependent antigen sheep erythrocytes, also referred to as the plaque-forming cell (PFC) assay, was the immunological assay conducted to evaluate the effect of Gasoline Isobutanol Vapor Condensate on the immune response. This assay has been shown to be the most predictive functional assay for determining the immunotoxicological potential of a compound (Luster *et al.*[1]).

Vanessa L. Peachee, Ph.D., was initially the Principal Investigator for the immunological evaluation conducted by ImmunoTox, and Gary M. Hoffman, B.A., DABT, was the ENVIGO Study Director.

In evaluating the effects of Gasoline Isobutanol Vapor Condensate on the immune system, the immunologic and toxicologic parameters evaluated were terminal body weight, spleen and thymus weights (absolute and relative), spleen cell number, and the spleen IgM antibody response to the T-dependent antigen (sheep erythrocytes, sRBC).

To the best of our knowledge, no significant protocol or standard operating procedure deviations occurred during the study, which affected the quality of the data and the ability to interpret the data with respect to the immunotoxicology of Gasoline Isobutanol Vapor Condensate.

## VI. METHODS OF PROCEDURE

### EXPERIMENTAL DESIGN

The immunotoxicological satellite study consisted of a vehicle group, three exposure levels of Gasoline Isobutanol Vapor Condensate, and a positive control group. There were 10 female Crl:CD(SD) CD® IGS rats in each of the groups. Animals were exposed by ENVIGO personnel to either vehicle (air only) or Gasoline Isobutanol Vapor Condensate at exposure levels of 2,000, 10,000 or 20,000 mg/m$^3$ via inhalation for 4 weeks (5 days per week). CPS, a known immunosuppressive agent, was given as the positive control. CPS, obtained from the Sigma Chemical Company (responsible for its characterization), was dissolved and diluted in phosphate buffered saline at ENVIGO to stock concentrations of 5.0 mg/mL for use as the positive control for this study. The positive control animals received 50 mg/kg @ 10 mL/kg of CPS, administered intraperitoneally (i.p.) once on the last 4 days of exposure. These animals were not chamber exposed. On the day of euthanasia, one day after the last exposure, ENVIGO personnel aseptically removed the spleen from each animal, weighed it, placed it in a collecting tube containing Earle's Balanced Salt Solution (EBSS) with HEPES and Gentamicin solution (prepared at ENVIGO), and shipped the spleens on ice in individual shipping containers by carrier to ImmunoTox for overnight delivery. Upon receipt, spleens were further processed for determination of IgM antibody response.

### VARIABLES ASSESSED

Terminal Body and Organ Weights. ENVIGO personnel euthanized (isoflurane inhalation followed by exsanguination) the animals on the day after the final exposure. The thymuses were removed, weighed, and preserved (formalin) for possible histopathology. Spleens were removed, weighed, and shipped at the time of sacrifice by ENVIGO personnel to ImmunoTox for immunotoxicological evaluation.

Splenocyte Preparation. Upon arrival at the ImmunoTox testing facility, spleens were accessioned in accordance with the SOP for receipt of biological samples. Single-cell suspensions were prepared from each spleen using a Stomacher® 80 Lab Blender in accordance with the SOP for rat spleens. Cell suspensions were then centrifuged and resuspended in EBSS with HEPES. Viability of splenocytes was determined using propidium iodide (PI) and the Coulter EPICS XL-MCL Flow Cytometer.

Spleen IgM Antibody Response to the T-dependent Antigen, sRBC. Day 4 Response. The primary IgM response to sheep erythrocytes was measured using a modified hemolytic plaque assay of Jerne[2]. Rats were exposed to the test article for 5 days per week for 4 weeks. Rats were sensitized by ImmunoTox personnel with 2x10$^8$ sRBC i.v. four days prior to euthanasia and, on the day after the last exposure, animals were euthanized by ENVIGO personnel. Spleen cell suspensions were prepared as described above. The cells were centrifuged and resuspended in a 6-mL volume, and 1:50 and 1:150 dilutions were

prepared. A 0.1-mL aliquot of spleen cells from each suspension was added to separate test tubes, each containing 25 µL guinea pig complement, 25 µL sRBC, and 0.5 mL of warm agar (0.5%). After thoroughly mixing, each test tube mixture was plated onto a separate petri dish, covered with a microscope cover slip, and incubated at approximately 36-38°C for 3 hours. Spleen cell counts were performed on the 6-mL samples using a Model Z1 Coulter Counter. The spleen weight, cells/spleen, AFC/$10^6$ spleen cells, and AFC/spleen were determined. The plaques, which developed, were counted using a Bellco plaque viewer. A plaque, occurring from the lysis of sRBC, is elicited as a result of the interaction of complement and antibodies (produced in response to the i.v. sensitization) directed against sRBC. Each plaque is generated from a single IgM antibody-producing B cell, permitting the number of AFC present in the whole spleen to be calculated. The data are expressed as specific activity (AFC/$10^6$ spleen cells) and total spleen activity (AFC/spleen).

As background, sheep erythrocytes (sRBC) are a T-dependent antigen and, thus, T cells, B cells, and macrophages are required to function properly in order to obtain an AFC response. If the test substance affects any of these cell types to a significant degree, an altered response will be observed. As a result, the T-dependent IgM response to sRBC is one of the most sensitive immunotoxicological assays currently in use. A significant modulation in the IgM AFC response, when appropriately compared to vehicle controls, indicates that the test agent is capable of modifying the humoral immune response in the whole animal and, thus, has the potential for immunotoxicity. This assay is one of the Tier I assays used by the NTP[3].

DATA

Data Handling and Statistical Analysis. The data obtained in this study were analyzed in accordance with standard operating procedure. Data in tables are presented as means ± standard error (SE). Data were first tested for homogeneity of variances using the Bartlett's Chi Square Test[4]. Homogeneous data were evaluated by a parametric one-way analysis of variance[5]. When significant differences occur, exposed groups were compared to the vehicle control group using the Dunnett's Test[6]. Non-homogeneous data were evaluated using a non-parametric analysis of variance[5]. When significant differences occur, exposed groups were compared to vehicle control group using the Gehan-Wilcoxon Test[7] when appropriate. The Jonckheere's Test[8] was used to test for exposure level-related trends across the vehicle and exposed groups. The positive control was compared to the vehicle control group using the Student t Test[9]. The criteria for accepting the results of the positive control in the assay was a statistically significant ($p \leq 0.05$) decrease in the response as compared to the vehicle control group.

P values of 0.05 or less, as compared to the vehicle control group, were considered statistically significant and are indicated in the tables and in the figures with a single asterisk (*). A double asterisk (**) was

used to indicate a p value of 0.01 or less. In the text, the word significant indicates that the response was statistically significant at $p \leq 0.05$. In the tables the abbreviation NS is used to indicate "Not Significant" for p values greater than 0.05.

Data Retention. All data and records were returned to the Contracting Sponsor following acceptance of the final report. Upon completion of this study, the report and raw data for this study will be maintained in the archives of ENVIGO.

## VII. RESULTS

### TERMINAL BODY AND ORGAN WEIGHTS.

The terminal body weight data from the study are shown in Table 1 for the control and Test Substance-exposed groups. The terminal body weights were obtained by ENVIGO personnel. The mean ending weight for the vehicle-exposed rats was 225.4 ± 4.0 grams. No statistically significant differences were observed in terminal body weights of the Gasoline Isobutanol Vapor Condensate-exposed animals at any exposure level as compared to the vehicle (air only) controls. In this study there was no difference in terminal body weights between the vehicle and the CPS groups; however, CPS is not used as the positive control for body weights.

The organ weights of the control and Test Substance-exposed rats are shown in Table 1. No effect was observed, following exposure to Gasoline Isobutanol Vapor Condensate, on spleen or thymus weights when evaluated as either absolute or relative weights. Treatment with the positive control, cyclophosphamide, had a statistically significant decrease of 51% on absolute spleen weight and a statistically significant decrease of 79% on absolute thymus weight, compared to the vehicle control. In addition, the positive control, cyclophosphamide, had a statistically significant decrease of 46% on relative spleen weight and a statistically significant decrease of 77% on relative thymus weight, compared to the vehicle control. Shown graphically in Figures 1 and 2 is the lack of effects on spleen and thymus weights following exposure to Gasoline Isobutanol Vapor Condensate.

Protocol No. ENVIGO Study No. 14-6485
Abbreviated Title: Immunological Evaluation of Gasoline Isobutanol Vapor Condensate

Figure 1

Absolute (mg) and Relative (%) Spleen Weight in Female Crl:CD(SD) CD® IGS Rats Exposed to Gasoline Isobutanol Vapor Condensate via Inhalation for 5 Days per Week for 4 Weeks

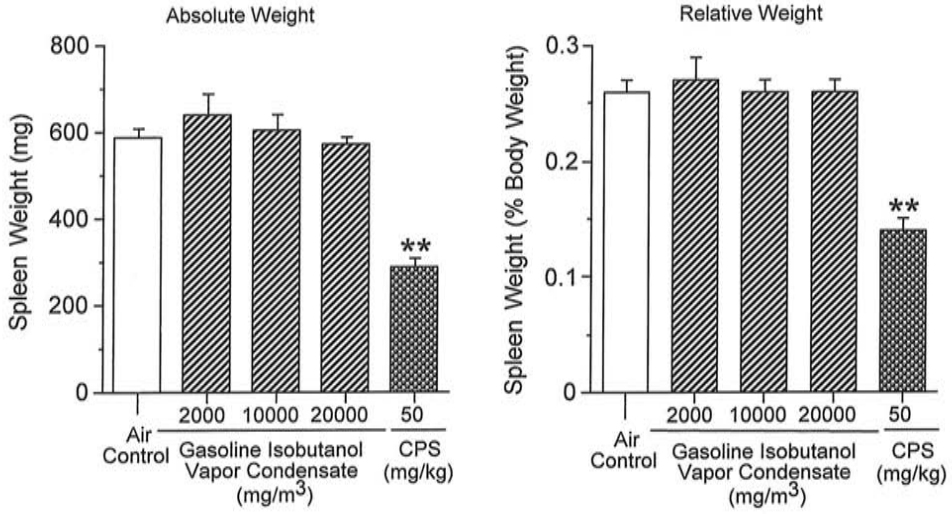
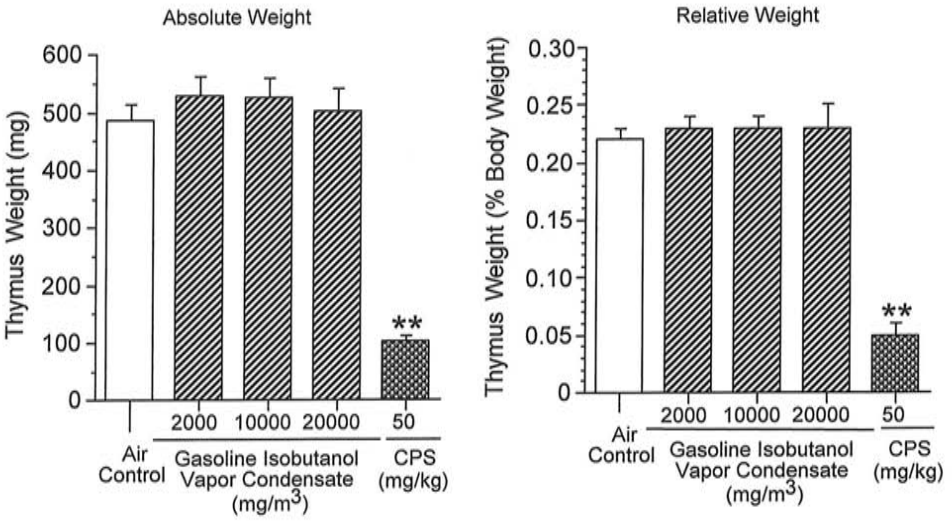



Figure 2

Absolute (mg) and Relative (%) Thymus Weight in Female Crl:CD(SD) CD® IGS Rats Exposed to Gasoline Isobutanol Vapor Condensate via Inhalation for 5 Days per Week for 4 Weeks



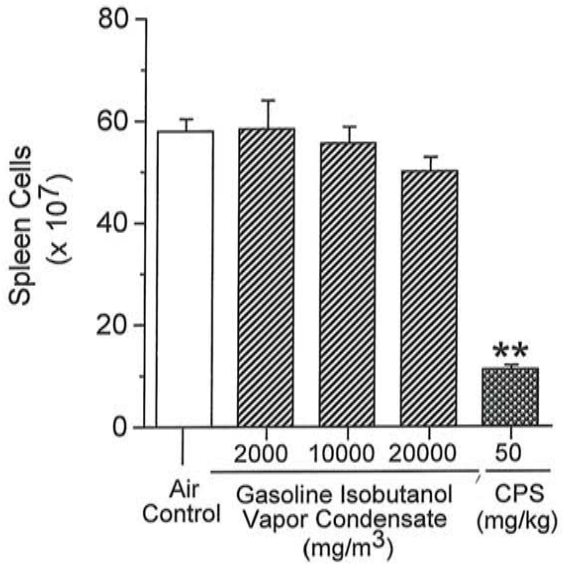
SPLEEN IGM ANTIBODY RESPONSE TO THE T-DEPENDENT ANTIGEN, SRBC. DAY 4 RESPONSE.

The spleen IgM antibody-forming cell response, i.e. plaque assay, was evaluated on spleens removed one day after the last exposure, which was Day 4 after antigen immunization. Day 4 after antigen sensitization is the peak day for the sRBC IgM AFC response in rats. Viabilities were conducted on all cell suspensions using propidium iodide (PI) and the Coulter EPICS XL-MCL Flow Cytometer. The viabilities from all samples were greater than 95%.

The results of the AFC response are shown in Table 2 and in Figures 3 and 4, where the mean and SE are provided. In addition, shown in Figure 5 are the individual animal responses presented in scatter diagrams. As indicated above, exposure to Gasoline Isobutanol Vapor Condensate did not result in spleen weights that were significantly different from the vehicle control group. Furthermore, as shown graphically in Figure 3, there were no significant differences in spleen cell number following exposure to Gasoline Isobutanol Vapor Condensate as compared to the vehicle control group. As expected, the positive control, CPS, produced an 80% decrease in spleen cell number when compared to the vehicle control group.

Figure 3

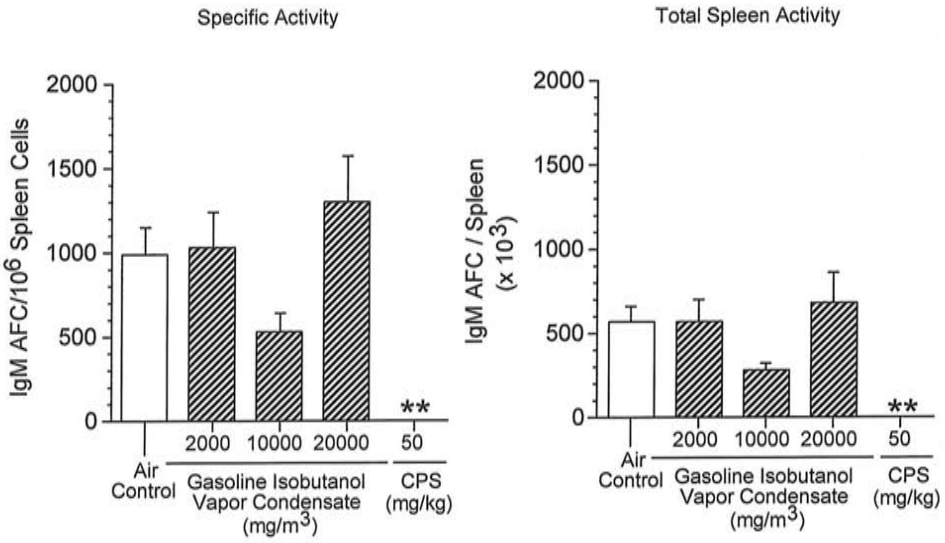
Spleen Cell Number in Female Crl:CD(SD) CD® IGS Rats Exposed to Gasoline Isobutanol Vapor Condensate via Inhalation for 5 Days per Week for 4 Weeks



Shown in Figure 4 are the functional results from the AFC assay where the response is expressed as mean ± SE values for Specific Activity (AFC/$10^6$ Spleen Cells) in the left panel or as Total Spleen Activity (AFC/Spleen) in the right panel. As can be seen, there were no significant differences between the vehicle animals and any of the Isobutanol treatment groups when evaluated as either Specific Activity or as Total Spleen Activity. As anticipated, the positive control, CPS, produced statistically significant decreases in Specific Activity (100%) and Total Spleen Activity (100%) when compared to the vehicle control animals.

Figure 4

IgM Antibody-Forming Cell Response to Sheep Erythrocytes in Female Crl:CD(SD) CD® IGS Rats Exposed to Gasoline Isobutanol Vapor Condensate via Inhalation for 5 Days per Week for 4 Weeks




Shown in Figure 5 are the results of the plaque assay where the AFC response is expressed as individual animal values for Specific Activity in the left panel and Total Spleen Activity in the right panel. By evaluating the individual animal data from the female outbred Crl:CD(SD) CD® IGS rats, the variability in the immune response, which occurs from outbred animals becomes apparent. As can be seen in the scatter diagrams of Figure 5, both "high" and "low" responders are found in each of the groups. This range of immune responses is controlled by a group of genes known as the immune response genes. There are several of these genes and depending on which of these genes an animal has, the greater or smaller the magnitude of the response for a specific immune assay.

In inbred strains of mice and rats, the immune response genes in a specific inbred strain are all identical. This is due to the breeding of brother – sister matings for over 100 generations. Accordingly, there are

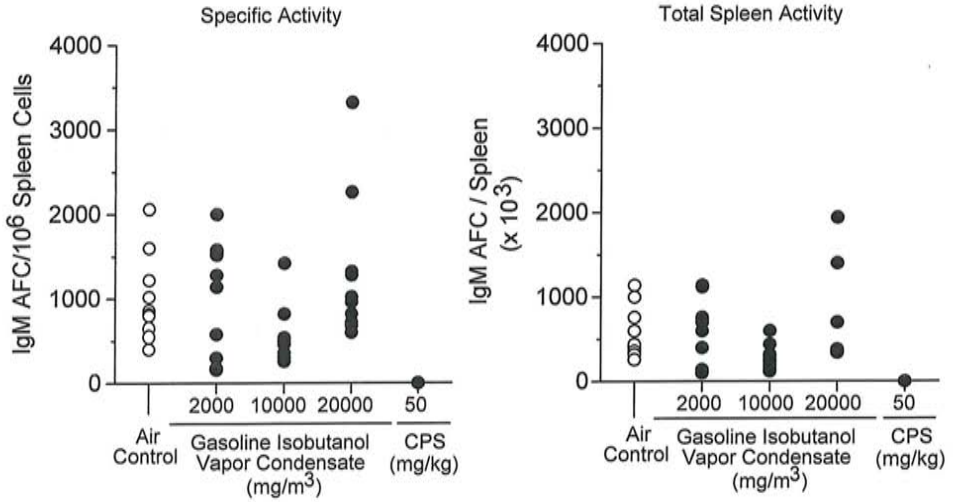
different levels (or magnitudes) of responses in the same assay depending on what strain is used. For example, some inbred rat strains are very low responders to the T-dependent antigen, sRBC, as measured by the Plaque Assay or the sRBC ELISA. In contrast, other inbred rat strains are much better responders to sRBC in the Plaque Assay.

In contrast to the inbred strains of rats, the outbred animals have various combinations of the immune response genes, and thus they also have various degrees of responses based on these genes. In general, the immune responses of outbred strains in immunotoxicological assays, particularly the T-dependent antibody response (TDAR), fall into three categories. These include high responders, medium responders, and low/non-responders. The response of the outbred animals is controlled by the different combinations of immune response genes that the outbred animals have inherited from their two parents, thus it is not surprising that one sees such a wide range of responses. While there is increased variability in the TDAR response in outbred rats, as compared to inbred strains, studies using outbred animals are valid and can be used for evaluating the immunotoxic potential of a compound.

As can also be seen in Figure 5, the known immunosuppressive agent, CPS, produced a decreased response in all of the animals that was statistically significant from the vehicle animals. This demonstrates that had an immunosuppressive effect occurred it would have been detected in the assay.

Figure 5

Individual IgM Antibody-Forming Cell Response to Sheep Erythrocytes in Female Crl:CD(SD) CD® IGS Rats Exposed to Gasoline Isobutanol Vapor Condensate via Inhalation for 5 Days per Week for 4 Weeks



## VIII. CONCLUSION

Exposure of female Crl:CD(SD) CD® IGS rats to Gasoline Isobutanol Vapor Condensate for a period of 5 days per week for 4 weeks resulted in no effects in the humoral immune response to the T-dependent antigen, sheep erythrocytes. Therefore, based on this study, the NOAEL was 20,000 mg/m$^3$.

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Table 1

Terminal Body Weight (g) and Organ Weights (mg) in Female Crl:CD(SD) CD® Rats Exposed to Gasoline Isobutanol Vapor Condensate via Inhalation for 5 Days per Week for 4 Weeks

14-6485

| Parameter | Air Control | Gasoline Isobutanol Vapor ($mg/m^3$) | | | Cyclophosphamide | H/NH | Trend Analysis |
|---|---|---|---|---|---|---|---|
| | | 2000 | 10000 | 20000 | 50 mg/kg | | |
| | (10) | (10) | (10) | (10) | (10) | | |
| Body Wgt (g) | 225.4 ± 4.0 | 233.2 ± 7.2 | 230.7 ± 6.8 | 220.8 ± 3.0 | 216.4 ± 3.6 | NH | NS |
| Spleen (mg) | 589 ± 19 | 641 ± 49 | 606 ± 37 | 575 ± 17 | 291 ± 18** | NH | NS |
| % Body Wgt | 0.26 ± 0.01 | 0.27 ± 0.02 | 0.26 ± 0.01 | 0.26 ± 0.01 | 0.14 ± 0.01** | H | NS |
| Thymus (mg) | 489 ± 26 | 528 ± 35 | 527 ± 33 | 503 ± 38 | 103 ± 8** | H | NS |
| % Body Wgt | 0.22 ± 0.01 | 0.23 ± 0.01 | 0.23 ± 0.01 | 0.23 ± 0.02 | 0.05 ± 0.01** | H | NS |

Female Crl:CD(SD) CD® rats were administered air control or Gasoline Isobutanol Vapor Condensate by inhalation via whole-body exposure for 5 days per week for 4 weeks. The positive control, cyclophosphamide, was administered i.p. on the last 4 days of exposure. On the day of euthanasia, spleens were placed in tubes containing media and sent to Richmond, VA, on ice for next day cell preparation. The rats were necropsied and indicated organs weighed. Values represent the mean ± SE derived from the number of animals indicated in parentheses. H = homogeneous data and NH = non-homogeneous data using the Bartlett's Test for homogeneity. Homogeneous data were evaluated using a parametric analysis of variance. When significant differences occurred, exposed groups were compared to the vehicle control group using the Dunnett's t Test. The positive control was compared to the vehicle control using the Student's t Test. Values significantly different from vehicle control at $p \leq 0.05$ are indicated by an asterisk, while those significant at $p \leq 0.01$ are noted by a double asterisk. The Jonckheere's Test was used to test for dose-related trends among the vehicle and exposed groups.

Key: g = grams; mg = milligrams; $m^3$ = cubic meter of air; kg = kilograms; Wgt = weight; i.p. = intraperitoneal; NS = not significant for p values greater than 0.05.

Table 2

Spleen Antibody-Forming Cell Response to T-Dependent Antigen Sheep Erythrocytes in Female Crl:CD(SD) CD® IGS Rats Exposed to Gasoline Isobutanol Vapor Condensate via Inhalation for 4 Weeks

14-6485

| Exposure | Body Weight (g) | Spleen Weight (mg) | Spleen Cells ($\times 10^7$) | IgM AFC/ $10^6$ Spleen Cells | IgM AFC/Spleen ($\times 10^3$) |
|---|---|---|---|---|---|
| Air Control | 225.4 ± 4.0 (10) | 589 ± 19 (10) | 58.18 ± 2.37 (10) | 991 ± 160 (10) | 573 ± 94 (10) |
| Gasoline Isobutanol Vapor Condensate | | | | | |
| 2000 mg/m$^3$ | 233.2 ± 7.2 (10) | 641 ± 49 (10) | 58.76 ± 5.49 (10) | 1030 ± 212 (10) | 579 ± 122 (10) |
| 10000 mg/m$^3$ | 230.7 ± 6.8 (10) | 606 ± 37 (10) | 55.67 ± 3.36 (10) | 533 ± 111 (10) | 282 ± 45 (10) |
| 20000 mg/m$^3$ | 220.8 ± 3.0 (10) | 575 ± 17 (10) | 50.36 ± 2.73 (10) | 1300 ± 272 (10) | 688 ± 174 (10) |
| Cyclophosphamide 50 mg/kg | 216.4 ± 3.6 (10) | 291 ± 18** (10) | 11.42 ± 0.75** (10) | 0 ± 0** (10) | 0 ± 0** (10) |
| H/NH | NH | NH | H | H | NH |
| Trend Analysis | NS | NS | $p \leq 0.05$ | NS | NS |

Female Crl:CD(SD) CD® IGS rats were administered air control or Gasoline Isobutanol Vapor Condensate via inhalation for a 4 week (6 hours per day, 5 days per week) exposure period. The positive control, cyclophosphamide, was administered via intraperitoneal injection to the positive control animals once per day for four days prior to euthanasia. Four days prior to euthanasia, animals were immunized with 2 x $10^8$ sRBC via tail vein injection. On the day after the final test substance exposure or final positive control dosing, the animals were euthanized by isoflurane inhalation followed by exsanguination. Spleens were removed, weighed, and placed into tubes containing EBSS with 15mM HEPES and supplemented with gentamicin. Spleen samples were then sent to Richmond, VA on wet ice for next day cell preparation. Spleens were prepared into single cell suspensions and the number of IgM sRBC antibody-forming cells was determined. Values represent the mean ± SE (standard error) derived from the number of animals indicated in parentheses. H = homogeneous data and NH = non-homogeneous data were evaluated using the Bartlett's Test for homogeneity. Homogeneous data were evaluated using a parametric analysis of variance. When significant differences occurred, exposed groups were compared to the vehicle using the Dunnett's Test. Non-homogeneous data were evaluated using a non-parametric analysis of variance. When significant differences occurred, exposed groups were compared to the vehicle using the Wilcoxon Rank Test. The positive control was compared to the vehicle using the Student's t Test. Values significantly different from the vehicle at $p \leq 0.01$ are noted by a double asterisk. The Jonckheere's Test was used to test for exposure level-related trends among the vehicle and exposed groups.

Key: g = grams; mg = milligrams; m$^3$ = cubic meter of air; kg = kilograms; NS = not significant for p values greater than 0.05.

## Annex 9 GFAP report

# Assessment of gasoline isobutanol vapor condensate neurotoxicity using an ELISA for the astrocyte protein, glial fibrillary acidic protein (GFAP)

**Envigo Study No.:** **14-6485**
Date: 25 February 2016

**Summary Report**
Gasoline Isobutanol Vapor Condensate:
A 13-Week Whole Body Inhalation Toxicity Study in the Rat

Envigo Study No. 14-6485
Measurement of Glial Fibrillary Acidic Protein


| **Principal Investigator:** | Study Director: |
|---|---|
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## STATEMENT OF COMPLIANCE

This study was conducted in the spirit of compliance with 79.60, CFR Vol. 59, No. 122, 27 June 1994. This study was performed according to protocol and Standard Operating Procedures.

[redacted] 25 February 2016

James P. O'Callaghan, Ph.D. Date
Principal Investigator

## SCIENTIST SIGNATURE

The following Scientist was responsible for the overall conduct of this study:

[redacted] 25 February 2016

James P. O'Callaghan, Ph.D. Date
Principal Investigator

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**Summary**

Toxicant-induced injury of the adult or developing central nervous system of the rat results in hypertrophy of astrocytes at the site of injury. The hallmark of this response is the enhanced expression of the major intermediate filament protein of astrocytes, GFAP. A 13-week inhalation exposure to Gasoline Isobutanol Vapor Condensate did not change GFAP levels in any of the eight brain regions examined in either males or females. Overall, the data suggest that exposure to Gasoline Isobutanol Vapor Condensate under the regimen employed does not result in gliosis in any of the eight brain regions examined.

**Introduction**

A characteristic feature of chemical-induced damage of the nervous system is selectivity; exposure to different nervous system toxicants results in damage to different brain regions and cell types (Switzer, 1991; Balaban, 1992; O'Callaghan et al., 1995). The differential susceptibility of nervous system cell types to injury often is referred to as "selective vulnerability"(Spencer and Schuamburg, 1980; Baumgarten and Zimmerman, 1992). An implicit assumption underlying this concept is that intrinsic properties of individual neural cell types render them susceptible to damage by specific chemical exposures (Baumgarten and Zimmerman, 1992). Unfortunately, our knowledge of the mechanisms that confer such vulnerability to specific toxic insults is limited. Thus, often there is no *a priori* basis for predicting the cell types affected by toxic exposures of the nervous system. Given the extreme cellular and molecular heterogeneity of the nervous system (McKay and Hockfield, 1982; Sutcliffe, 1988), the fact that targets of chemical-induced neurotoxicity are diverse and unpredictable should not be surprising. This biologically-based situation does, however, make assessment of neurotoxicity difficult because one must face the problem of deciding where to look for damage. Overcoming this obstacle requires a "marker" of neural injury that can be used to localize (i.e. "mark") sites of damage anywhere in the nervous system.

A universal cellular reaction to damage of the central nervous system is hypertrophy of astrocytes. The hallmark of this response, often termed "reactive gliosis," is the enhanced expression of the major intermediate filament protein of astrocytes, glial fibrillary acidic protein (GFAP). Thus, an increase in the brain concentration of GFAP serves as a bio-chemical indicator of neurotoxicity. To validate the use of GFAP as a biomarker of neurotoxicity, prototype neurotoxicants have been administered to experimental animals and the effects of these agents on the tissue content of GFAP have been determined by immunoassay (O'Callaghan, 1991; Norton et al., 1992). Assays of GFAP were found to reveal dose-, time- and region-dependent patterns of neurotoxicity at toxicant dosages below those that cause light microscopic evidence of cell loss or damage (O'Callaghan, 1988; Norton et al., 1992). Moreover, the temporal and regional increments in GFAP correspond to the temporal and regional patterns of neuronal damage, as revealed by sensitive silver stains (Balaban, 1992). These findings indicate that assays of GFAP represent a sensitive, simple and quantitative approach for evaluation of nervous system damage (O'Callaghan, 1991; Norton et al., 1992; O'Callaghan and Sriram, 2005).

As part of the U.S. Environmental Protection Agency's testing requirements under the Clean Air Act, identification and characterization of the potential adverse effects of gasoline and various oxygenate-gasoline blends is to be determined. Neurotoxicity assessment constitutes a portion of these testing activities. The purpose of the present study was to use the GFAP assay for assessing the potential neurotoxic effects of Gasoline Isobutanol Vapor Condensate. A control (air) and three exposure levels to the test

condensate (2,000, 10,000 and 20,000 mg/$m^3$) were used. Although the EPA Guidelines (CFR 59, No. 122, 79.67, 1994) specify six regions to be analyzed, we expanded our analysis to include an additional two areas of the brain to maximize the potential for detecting enhanced expression of GFAP due to exposure to the test substance.

**Materials, Methods/Procedures**

**STUDY DATES**

**STUDY INITIATION**

03 February 2015 (Date Study Director signed the Protocol)

**DATE OF ANIMAL RECEIPT**

03 February 2015

**EXPOSURE INITIATION**

23 February 2015 (Experimental Start Date)

**EXPOSURE TERMINATION**

27 May 2015

**TERMINAL SACRIFICE**

28 May 2015

**STUDY COMPLETION**

25 February 2016 (Date Principal Investigator signed the Final Report)

**I. Basic Protocol 1: GFAP Sandwich ELISA**

A. **Introduction**: The GFAP sandwich ELISA is suitable for assaying the concentration of GFAP present in homogenates of brain tissue. This method has successfully been applied to analysis of at least the following species: mouse, rat, guinea pig, dog, monkey, man, chicken, pigeon, trout and cod. Because GFAP is evolutionarily conserved, it is likely that this assay can be very broadly applied across many species. The assay does not require preparation of any special materials or reagents; all components are available from commercial sources at modest cost. The 96-well microplate format lends itself to processing large numbers of samples and it makes the assay suitable for automation with a variety of liquid handling systems. It takes a minimum of 5 hours to process a single 96-well plate after preparation of the tissue homogenates (Support Protocol 1).

B. **Materials**:

Vortex Mixer or Ultrasonic Cell Disruptor (e.g. Qsonica Cat. # Q125, 2 mm probe)
Pipettes
Hot/Stir Plate
Microplate Reader
96-well Microtiter Plates (Immulon 2, Dynatech)
Pipette tips
Rabbit anti-Glial Fibrillary Acidic Protein Antibody (DAKO, Cat. #Z0334)
Non-Fat Dry Milk (Carnation)
Mouse anti-Glial Fibrillary Acidic Protein Antibody (Sigma Cat.

#G3893)
Phosphate Buffered Saline (e.g. Pierce Cat. #28374)
Alkaline Phosphatase conjugated anti-mouse IgG (Jackson Immuno Research Ca.t #315-055-003)
Alkaline Phosphatase Substrate Kit (e.g. Bio-Rad Cat. #172-1063)
Triton X-100 (e.g. Sigma Cat. #X-100)
Sodium Hydroxide (e.g., 10N NaOH, Fisher SS255-1)

C. **Protocol Steps:**

**1. Standard Curve Preparation**

1. Prepare a GFAP standard: The preferred standard consists of an aliquot of a brain homogenate prepared as described in Support Protocol 1. This standard was prepared from the same species that was used to prepare the samples to be assayed for GFAP because GFAP immunoreactivity with a given set of immunodetection reagents will differ among different species. A large number of standards were prepared in advance from a single "pool" of a 1% SDS homogenate prepared as described in Support Protocol 1. This homogenate was aliquoted and stored frozen at -80°C prior to use. *Thus, the GFAP standard essentially consists of a control sample. This is preferable over using a pure GFAP standard because using control tissue as a standard obviates any influence of the tissue "matrix" on the assay performance*. To express the data in units of GFAP per unit of total protein, aliquots of a 1% SDS homogenate were used as a GFAP standard. This was accomplished by "standardizing the standard" with addition of a known amount of pure GFAP to the 1% SDS homogenate (i.e. an internal standard). Immunoreactivity values generated from standard curves of the GFAP "spiked" homogenate and the homogenate alone were used to determine the concentration of GFAP in homogenate. For analysis of GFAP in regions of rat brain, we used aliquots of a hippocampal homogenate as a standard. It contains approximately 2.5 μg GFAP per mg of total protein. Other species (e.g. mouse) contain different levels of GFAP in hippocampus.
2. Prepare dilutions of the GFAP standard: A tube of the GFAP standard was removed from the freezer, thawed at room temperature and vortexed prior to dilution. The rat hippocampal homogenate, was used as the standard (~2.5 μg GFAP/mg total protein), the total protein value from this homogenate (~ 10 mg/ml) was used to prepare the standard curve in PBS plus 0.5% Triton X-100. For rat hippocampal homogenate, the protein values for the standard curve should be between approximately 0.25 to 10 μg/100μl/microplate well (i.e. 0.25, 0.5, 1.0, 2.5, 5.0, 7.5, 10μg total protein/100μl). Table 1 shows an example of dilutions needed to prepare a standard curve from a homogenate of rat hippocampus (hippocampus std.). *Typically, standards are run in duplicate. Detergents act as wetting agents, therefore, more than a single use of a pipette tip with SDS- or Triton X-100-containing samples can lead to carry-over errors. Thus, it is recommended to use only a single pipette tip per sample and to withdraw the sample only a single time per tip.*

**2. Sample Preparation**

1. Thaw and mix samples: Samples were removed from the freezer, thawed at room temperature and vortexed or sonified prior to dilution.
2. Prepare dilutions of the samples: The samples were diluted in PBS + 0.5% Triton X-100 to a concentration of approximately 10µg total protein/ 100µl. Samples high in GFAP (e. g. cerebellum) may need to be diluted to a concentration of 5µg total protein/100µl of PBS + 0.5% Triton X-100. Samples low in GFAP (e.g. striatum) may need to be diluted to 20µg total protein/100µl of PBS + 0.5% Triton X-100. These dilution factors are determined empirically. *The best practice is to prepare multiple dilutions of each sample to insure that optical density readings for a given sample fall on the linear portion of the standard curve. Typically, samples (like standards) are run in duplicate. Detergents act as wetting agents, therefore, more than a single use of a pipette tip with SDS- or Triton-X-100-containing samples can lead to carry-over errors. Thus, it is recommended to use only a single pipette tip per sample and to withdraw the sample only a single time per tip.*

**3. GFAP Assay**

1. Coat Immulon-2 flat bottom plates with rabbit anti-GFAP. 1.0µg total immunoglobulin protein was added to /100 µl PBS /well, (~35µl of anti-GFAP [Dako] in 10 ml of PBS is the quantity needed per plate).
2. The coated plates were incubated at 37$^{o}$C for 1 hour. This step may be done at the beginning of the assay or plated the day before and stored overnight at 4$^{o}$C. All other incubation and reagent addition steps were performed at room temperature.
3. The plates were emptied into a sink and tapped on absorbent paper to remove excess liquid. *This latter procedure is important to eliminate the possibility of any reagent carry-over between steps.*
4. Plates were washed 4X with PBS (200 µl per well), tapping and blotting between each wash.
5. Plates were blocked 1 hour with 5% non-fat powdered milk in PBS at 100 µl per well.
6. Plates were emptied, tapped on absorbent paper (upside down) to remove excess liquid. Diluted standard curve and samples were loaded in a volume of 100 µl per well, then incubated for 1 hour. The template, Table 2, is an example of a typical 96-well microplate layout for GFAP standards and unknowns.
7. Plates were washed 4X with PBS + 0.5% Triton X-100, 200 µl/well.
8. Plates were incubated for 1 hour in monoclonal anti-GFAP (1:1500)(Sigma) + alkaline phosphatase conjugated anti-mouse IgG (1:1500)(Jackson ImmunoResearch) made up in 5% non-fat dry milk + 0.5% Triton X-100, 100µl /well.
9. Plates were washed 4X with PBS + 0.5% Triton X-100, 200 µl/well.
10. P-nitrophenylphosphate substrate (Bio-Rad) was added in a volume of 100 µl/well and incubated for 20 minutes.
11. "Popped" any bubbles in the plate wells with a needle or pipette tip to insure uniform and accurate readings of standard and sample ODs. Read plates at 405 nm.

12. Calculated the GFAP concentration in the samples by comparing their optical density (OD) values to those obtained for the linear portion of the GFAP standard curve. Software programs linked to specific plate readers should be programmed to plot OD vs. GFAP values in linear vs. log linear fashion. Typically, we utilize the 4-parameter curve fit equation and generate curves as shown in Fig. 1 and Table 3. Most programs allow for automatic subtraction of blanks and incorporation of dilution factors. Data was expressed as μg GFAP/per mg total protein or, if the absolute amount of GFAP in the standard is not available, data was expressed as GFAP-like immunoreactivity/per mg total protein. Total protein concentration in the samples was estimated from the total protein assay described in Support Protocol 2. Data also can be expressed on the basis of tissue wet weight (μg GFAP/gram wet weight or GFAP immunoreactivity/gram wet weight). Although this approach permits elimination of the total protein assay (Basic Support Protocol 2), we find that the GFAP values obtained are slightly more variable.

## II. Support Protocol 1: Brain tissue preparation

**A. Introduction**: This support protocol describes the procedure for preparing brain tissue for subsequent analysis of GFAP by Sandwich ELISA (Basic Protocol 1). This procedure does not describe or recommend a specific approach for dissecting brain tissue. *It is noted, however, that reliable dissections are essential for obtaining reproducible results with the GFAP ELISA (see commentary).*

**B. Materials:**

Dissecting Instruments
Balance
Ultrasonic Cell Disruptor (e.g. Qsonica #Q125, 2 mm probe)
Pipettes
Hot/Stir Plate
Pipette tips
Microfuge tubes

**C. Protocol Steps:**

1. Animals were sacrificed and the brains removed as rapidly as possible.
2. Brain regions were dissected. If a number of regions are to be dissected, this process can be aided by keeping the brain firm on a cold plate (e.g. Thermoelectrics cold plate, Aldrich Chemical Co. or simply an inverted petri dish placed on ice) maintained at approximately 4°C. Rat or mouse brains can be dissected into 10-15 regions, free hand, within approximately 10 minutes. For this study, eight regions were dissected: Striatum, Hippocampus, Cortex, Olfactory Bulb, Thalamus, Hypothalamus, Cerebellum, and Rest of Brain. *This number of regions can be prepared on a cold plate or at room temperature without degradation of GFAP as assessed by immunoblot analysis. All brain regions can be stored frozen indefinitely in capped microfuge tubes at this step in the protocol, or you can proceed to the next step.*
3. Brain regions were placed in appropriately labeled microfuge tubes, or other suitable storage tube, and placed on dry ice until transferred to -80°C for storage.

## III. Support Protocol 2: Assay for Total Protein

A. **Introduction**: This support protocol describes the procedure for assaying the concentration of total protein in the SDS-homogenates. The procedure described essentially is the bicinchoninic acid (BCA) method described by Smith et al. (1985) which is available in kit form (see materials). To assay total protein concentration of the SDS-homogenates the assay must be compatible with 1% SDS. Use of the BCA assay is not an absolute requirement as other detergent compatible methods are available (e.g. Bio-Rad DC protein assay). Bovine serum albumin is used as the protein standard in the described procedure. Other protein standards can be substituted.

**B. Materials:**

Microplate Reader
Pipettes
Pipette tips
96-well Microtiter Plates
Microfuge tubes
Incubator
Vortex Mixer
Miscellaneous Laboratory Glassware
BCA Protein Kit (Pierce #23225)
Bovine Serum Albumin (BSA) (Sigma A7906)
Sodium Dodecyl Sulfate (e.g., 10% SDS Bio-Rad #161-0416)

**C. Protocol Steps:**

1. 1% SDS was prepared by adding 10ml of 10% SDS to 90 ml dH2O.
2. The dissected brain parts were weighed and homogenized. The tissues were immersed in 10 volumes of hot (85-95°C) 1% (w/v) SDS. For example, 0.1 grams of tissue was immersed in 1.0 ml of SDS. While the SDS is still hot, the tissue was homogenized by sonification with an ultrasonification microprobe. Large brain areas are sonified in the glass homogenization vessel with the ultrasonification microprobe, then homogenized using a motor-driven Teflon pestle. Samples were stored frozen (-80°C) at time of sacrifice prior to assay. *Samples prepared and stored in this manner retain their GFAP content for at least 5 years.*
3. Total protein standards were prepared. A 1 mg/ml solution of BSA in 1% (w/v) SDS was prepared by adding 10mg BSA to 10 ml 1% SDS. *Aliquots of this standard can be stored frozen at -80° C for future use. Thaw as needed, but do not re-freeze.*
4. A total protein standard curve was prepared. The BSA standard was diluted in 1% SDS as follows: 1.0, 2.5, 5.0, 7.5, and 10 µg/10µl of 1% SDS (no dilution is required for last standard). Each tube was vortexed and 10 µl of each standard was added to a well of the microtiter plate; 10 µl of 1% SDS was added to serve as a blank. *Typically, standards are run in duplicate. Detergents act as wetting agents, therefore, more than a single use of a pipette tip with SDS-containing samples can lead to carry-over errors. Thus, it is recommended to use only a single pipette tip per sample and to withdraw the sample only a single time per tip.*

5. Dilutions of the samples were prepared by thawing the samples, vortexing and diluting a 10 µl aliquot with 190 µl of 1% SDS. The dilution tube was vortexed and a 10 µl aliquot was added into a well of a microtiter plate.
6. The protein assay reagent was added. 200 µl of the BCA reagent (composed of 50:1 ratio of solution A: solution B of the Pierce BCA reagent) was added to each standard and sample
7. The plates were incubated at 37°C for 30 minutes. *Other incubation temperatures are permissible; follow direction provided with the kit.*
8. Any bubbles were "popped" in the microtiter plate wells with a needle or pipette tip to insure uniform and accurate readings and the plates were read at 562 nm. The concentration of total protein in the samples was calculated from the standard curve. Software programs linked to specific plate readers should be programmed to plot OD vs. total protein in a linear fashion. Most programs allow for automatic subtraction of blanks and incorporation of dilution factors. Because the samples were prepared in 10 volumes of diluent, typically, total protein values are approximately 10 mg/ml.

## IV. Reagents and Solutions

1. **Phosphate Buffered Saline (PBS)-** One packet of PBS was mixed thoroughly with 500 ml of deionized water to give a final concentration of: 137 mM NaCl/1.0 mM KCl/2 mM $KH_2PO_4$/8.0 mM $Na_2HPO4{\cdot}7H_2O$/pH 7.4 (can be stored at 4°C for at least a month). For this and all subsequent reagents and solutions, determine the total volume that needs to be prepared based on the use of 100 µl/well and 96 wells per plate (washes take 200 µl/well).
2. **PBS+0.5% Triton X-100**- 2.5ml of Triton X-100 was added to 500 ml of PBS (can be stored at 4°C for at least a month).
3. **Blocking agent(BLOTTO)- (**PBS + 5% powdered milk or PBS + 0.5% Triton X-100 + 5% powdered milk). Five grams of non-fat powdered milk was added per 100 ml of PBS or per 100 ml of PBS + Triton X-100. Prepare at least 100 ml of each to facilitate dissolving the powdered milk; PBS may be warmed slightly to facilitate this process. Make these solutions up fresh the day of assay and do not save. Also, do not retain the powdered milk for greater than a month or two (room temperature). The dry milk tends to discolor and will not go into solution at shelf times longer than 2 months.
4. **Polyclonal anti-GFAP** (Dako)- 35µl of antibody solution was added to 10ml of PBS. The assay is based on the use of this antibody as a "capture" reagent. Substitution of an antibody from another vendor may not yield suitable results. Make this solution fresh on the day of use and do not save.
5. **Monoclonal anti-GFAP** (Sigma) **combined with Alkaline Phosphatase-conjugated anti-mouse IgG** (Jackson ImmunoResearch)- A stock solution of alkaline phosphatase-conjugated anti- mouse IgG was made up as per the vendors' instructions. Stock stored at 4°C as per the vendor's instructions. 7µl of the monoclonal antibody solution stock and 7 µl of the alkaline phosphatase conjugate stock was added to10ml powdered milk +0.5% Triton X-100. The assay is based on the use of the monoclonal antibody as a "detection" reagent and the alkaline phosphatase conjugate to bind to the detection antibody and generate a colored reaction product proportional to the amount of antigen (GFAP) present in the samples. Substitution of antibodies from other vendors may not yield suitable results. Make these solutions fresh on

the day of use and do not save.

6. **P-nitrophenylphosphate substrate** (BioRad)- 2ml of diethanolamine buffer was mixed with 2 p-nitrophenylphosphate tablets and 8 ml of deionized water. Make this solution fresh on the day of use and do not save.
7. **Sodium Hydroxide** (Fisher)- 40ml of 10N Sodium Hydroxide was mixed with 960ml of deionized water.

## V: General Commentary on GFAP Assays; Specific Commentary on the GFAP ELISA

### A. Background Information

It has long been known that damage to the central nervous system results in astrogliosis (gliosis, reactive gliosis, glial activation), a response to brain injury characterized by hypertrophy and, less often, hyperplasia of astrocytes, a sub-type of CNS glia (Eng, 1988; Norenberg, 1994). At the electron microscopic level, astrogliosis is characterized by the accumulation of glial filaments. GFAP was found to be the major protein component of these filaments (Eng, 1988). As such, GFAP serves as a biomarker for filament accumulation and, therefore, of gliosis (Eng, 1988; Norton et al., 1992; O'Callaghan, 1993). With the development of antibodies to GFAP, immunohistochemical analysis of this protein soon documented that gliosis occurs in response to diverse insults of the CNS, including trauma, disease, and toxic exposures (Eng, 1988; Norenberg, 1994; Norton et al., 1992; O'Callaghan, 1993; O'Callaghan et al., 1995). Thus, a large body of evidence now has been accumulated demonstrating the ubiquity of the glial response to all types of CNS damage based on immunohistochemistry of GFAP. Only recently, however, have methods been introduced to assay levels of GFAP as a means of quantifying gliosis.

While GFAP immunohistochemistry has proven useful for revealing patterns of gliosis after brain injury, this approach does not lend itself to quantification or the analysis of large numbers of samples. Small (25-50%), but toxicologically significant increases, also may be difficult to detect by immunohistochemistry. These drawbacks, combined with the need to develop quantitative biomarkers of neurotoxicity (O'Callaghan et al., 1995), and to define quantitative aspects of toxicant- and disease-induced gliosis, has prompted the development and implementation of a number of GFAP assays. These assays have been applied to examine gliosis in specific brain areas already known to be affected by disease or other insult. In addition, they also can be broadly applied in a risk assessment context (U.S. EPA) to screen for potential sites of neural damage resulting from toxic exposures of the CNS. Recently, analysis of GFAP has been used to demonstrate that the degree of cortical gliosis in postmortem brain tissue from victims of Alzheimer's disease correlates with the severity of dementia scores in these individuals prior to death (G. Webster Ross, submitted). Analysis of GFAP in cerebrospinal fluid (CSF) also has been applied to the human condition as an indicator of the severity of traumatic injury to the brain (Rosengren et al., 1994). Finally, analysis of GFAP can be used as an indicator of the presence of brain or spinal cord contamination of meat (Schmidt et al., 1999).

Of the number of GFAP assays that have appeared in the literature over the last 15 years, all essentially fall into two categories: 1) solid phase immunoassays where GFAP is immobilized on a solid support matrix and detected by mono- or polyclonal antibodies or 2) liquid-phase assays where GFAP from brain extracts or solubilized brain tissue (or CSF) is "captured" by one antibody and then detected by another antibody raised in a different host species (Butler et al., 1986). The assay described in this study is of the second type and it has a number of advantages over the solid phase assays. Specifically, solid-phase detection and "quantification" of GFAP most commonly involves the time-consuming resolution of a protein mixture by SDS-PAGE, followed by electrophoretic transfer to a solid support membrane. Anti-GFAP antibodies coupled to a variety of detection reagents then can be used for quantification of GFAP bound to the membranes. Unfortunately, this approach has been found to severely underestimate the concentration of GFAP in the resolved mixture of proteins and the effects of treatments known to increase GFAP (O'Callaghan et.al., 1999). Other solid phase assays for GFAP have been developed that do not rely on prior resolution of protein mixtures by SDS-PAGE (Wang et al., 1990; O'Callaghan, 1991b). These assays incorporate manual spotting of brain homogenates on solid supports, with or without the aid of a template. The membranes are then incubated with anti-GFAP polyclonal or monoclonal antibodies, which, in turn, are bound by $^{125}$I Protein A. Quantification is achieved by gamma spectrometry or by densitometry of the autoradiographs. These assays give a linear signal over a fairly large range of spotted protein. However, they require large amounts of reagents, including radiolabeled reagents, and they do not have impressive throughput.

The sandwich ELISA for GFAP described in this study or similar ELISAs described previously (Eng et al., 1986; Kretzschmar et al., 1985; O'Callaghan, 1991; Rosengren et al., 1994), have several advantages in comparison to the other methods for assaying GFAP described above. They are easier to perform because they have fewer steps. They are more sensitive. Although they may require a greater number of reagents, ELISAs adapted to the microplate format permit the use of very small volumes, which results in a significant overall cost reduction. The 96-well microplate format also has the advantage of speed and high throughput. From sample application to data collection, all steps can be performed in the plate. Moreover, the microplate-based format permits the entire assay to be automated through the use of robotic liquid handling processors. Finally, radioactivity is not involved, making the assay safer to perform and allowing the user to avoid costly and time-consuming radioactivity disposal procedures. While most of the GFAP sandwich ELISAs described to date are similar and share the advantages afforded by this technique, the assay described in this study may have a few additional advantages. Because it is based on detergent-solubilized homogenates of a given brain area, any treatment effects can be directly related to effects in that brain area, rather than an arbitrarily defined extract or sub-fraction that may contain only a portion of the total GFAP in that area. Using a solubilized homogenate rather than a subfraction of a given brain area also facilitates comparisons of quantitative data on GFAP to immunohistochemical staining of GFAP in that area. Moreover, it also helps rule out inter-laboratory differences associated with assaying GFAP content in one type of extract in one lab, and another type of extract/fraction in another lab. Finally, the same SDS-denatured homogenate used to assay GFAP can be subjected to multiple assays for additional glial or neuronal proteins, thereby permitting comparisons to be made among multiple markers of neurotoxicity in a single sample.

For example, the dopaminergic neurotoxicant, 1-methyl-4-phenyl-1,2,3,6-tetra-hydropyridine, causes a large increase in GFAP that results from damage to dopaminergic nerve terminals, damage that can be quantified by immunoassay of tyrosine hydroxylase (TH), a marker of dopamine containing nerve terminals in the target region (O'Callaghan et al., 1990). Both markers can be assayed from aliquots of the same tissue sample and, on this basis, we find that larger decreases in TH predict greater increases in GFAP.

**B. Critical Parameters**

The most critical aspect of the GFAP assay is the absolute requirement for preparation of consistently dissected regions of the brain (see Support Protocol 1). Consistent dissections yield consistent GFAP values with the use of only a few animals per dose or time point (see Anticipated Results). The particular regions to be dissected depend on the questions being addressed. If a target region is known or suspected, dissections can be limited to the region of interest. If the GFAP assay is being applied in a screening context, multiple (10-15) brain regions must be dissected in order to avoid the possibility of diluting localized increases in GFAP. The possibility exists that extremely localized increases in GFAP may fail to be detected with the assay. While GFAP immunohistochemistry is relatively insensitive in comparison to the GFAP assay, and it may not detect small increases in GFAP, it can reveal small "hot spots" of gliosis (e.g. see effects of MK-801) (Fix et al., 1995). Such discrete astrocytic responses could escape quantification with the GFAP assay due to dilution of signal by surrounding tissue. No one approach can be broadly applied to detect all toxicant-induced damage of the CNS. Therefore, it is prudent to use the GFAP ELISA in conjunction with GFAP immunohistochemistry and other sensitive morphological approaches for detection of neural damage, such as silver degeneration stains (Switzer, 2000), Fluoro-Jade (Schmued et al., 2000), and stains that detect activated microglia (Streit et al., 1999).

In terms of the GFAP ELISA itself, the key requirements for optimal performance of the assay include: 1) use of the specified antibodies, 2) addition of the reagents at room temperature, 3) fresh (daily) preparation of all reagents containing antibodies and/or non-fat dry milk and 4) mixing of the standards and samples prior to their dilution or addition to the microplate wells. A troubleshooting guide is provided in Table 4 that covers most problems encountered with the assay.

**C. Troubleshooting (see Table 4)**

**D. Typical Results**

Typical GFAP assay values obtained for different regions of the rat brain are presented in Fig. 2 (i.e. historical data). Absolute values for GFAP (μg/mg total protein) may vary depending on the GFAP standard used and the species subjected to evaluation. Region-to-region differences in GFAP values from untreated animals of a given species, however, should remain stable, if consistent dissections are performed.

**E. Time Considerations**

The GFAP assay requires approximately 5 hours for one person to process a 96-well microplate. The time required to prepare brain samples depends on the number of brain areas to be dissected and on whether the areas are stored frozen prior to homogenization With practice, 10 brain areas can be prepared (and homogenized) from 50 rats in a day. Two people are required: one to dissect the brains and one (or more) to weigh and homogenize the tissue. The total protein assay requires approximately 1 hour for one person to process a 96-well microplate.

**Statistics**:

The effect of treatment on GFAP concentration was determined by separate one-way Analysis of Variance for each of the eight brain areas from males and females utilizing SigmaPlot statistical software (v 12). The significance level was set a $P<0.05$. No significant differences were found in any brain region, at any concentration or in either males or females.

**Results and Conclusions**

The results of the GFAP analysis are presented in Tables 5, 6, 7 &8. Results are reported according to gender, because sex-dependent responses to toxic substances are not uncommon, including responses reflected in levels of GFAP. Control levels for GFAP varied markedly according to brain region, consistent with known levels observed for GFAP across different brain regions (see Fig. 2). The 13-week exposure to Gasoline Isobutanol Vapor Condensate did not affect GFAP levels in any brain region in either male or females. These data suggest that under the exposure conditions employed, damage-induced gliosis did not occur in any of the brain regions examined. The known hippocampal neurtoxicant, TMT, was used as a positive control compound to asses the GFAP response to hippocampal damage (Table 8). These TMT samples were generated from rats exposed to 8 mg/kg, i.p. at the CDC in Morgantown, WV. OB samples from the Gasoline Isobutanol Vapor Condensate study were re-assayed for GFAP to assess reproducibility of the GFAP assay. TMT samples showed large-fold (> 5) increases in GFAP. OB samples showed GFAP levels consistent with the original assay values (Tables 6 & 7). Overall, these data suggest that under the exposure conditions employed, damage-induced gliosis as a function of exposure to Gasoline Isobutanol Vapor Condensate did not occur in the brain regions examined. Toxicant-induced gliosis (as reflected by an enhanced expression of GFAP) is highly dose-, region-, and time-dependent. Therefore, it is possible that exposure to higher concentrations, examination of more brain regions, examination of more discrete dissections of a given brain region, or the inclusion of more time points, might have resulted in positive findings. In conclusion, exposure to Gasoline Isobutanol Vapor Condensate did not appear to result in gliosis in eight representative brain regions in males or females.

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**Figure Legends**

Figure 1. Sample GFAP standard curve. GFAP values in nanograms correspond to levels found in .25 –10 μg total hippocampal homogenate protein. Dilutions of this homogenate were used to construct the GFAP standard curve shown.

Figure 2. Levels of GFAP found in different regions of untreated rat brain. OB, olfactory bulbs; Str, striatum; Hip, hippocampus; Hypo, hypothalamus; Ctx, cortex; Cbm, cerebellum; BS, brain stem. Values are mean ± SE. Adapted from Martin and O'Callaghan, 1995.

**Figure 1**

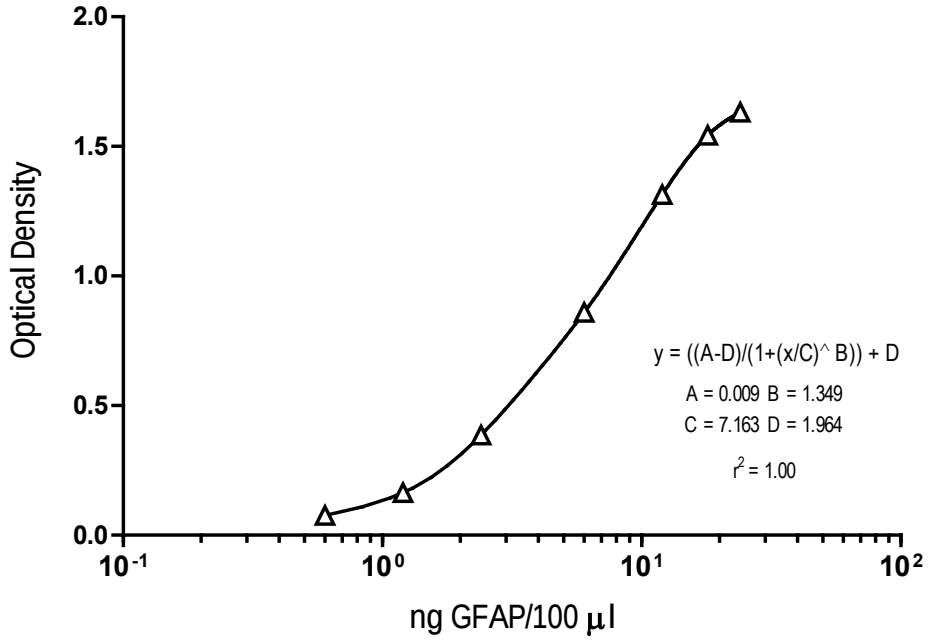
2.0
1.5
1.0
0.5
0.0
Optical Density
$10^{-1}$
$10^{0}$
$10^{1}$
$10^{2}$
ng GFAP/100 µl
y = ((A-D)/(1+(x/C)^ B)) + D
A = 0.009 B = 1.349
C = 7.163 D = 1.964
$r^2$ = 1.00

**Figure 2**

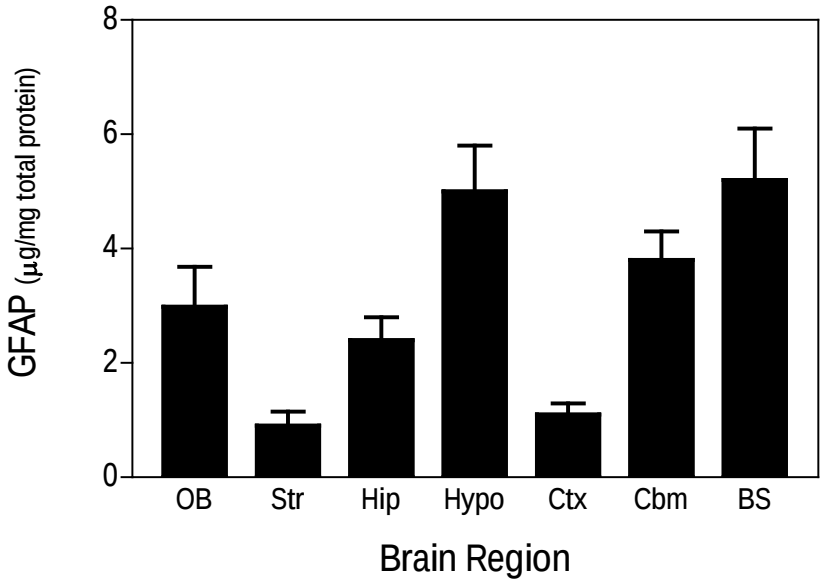
GFAP (µg/mg total protein)
8
6
4
2
0
OB
Str
Hip
Hypo
Ctx
Cbm
BS
Brain Region

**TABLE 1: GFAP Standard Curve Preparation**

| Tube # | µg of total protein/100µl/well (ng of GFAP) | µl of Hippo-campus Std. (10.34 mg/ml) | Serial Dilution | µl of PBS+ 0.5% Triton X-100 |
|---|---|---|---|---|
| 1 | 10 µg (25.00ng) | 29 µl | | 2971 µl |
| 2 | 7.5 µg (18.75ng) | | 2063 µl from tube #1 | 687 µl |
| 3 | 5.0 µg (12.50ng | | 1833 µl from tube #2 | 917 µl |
| 4 | 2.5 µg (6.25ng) | | 1000 µl from tube #3 | 1000 µl |
| 5 | 1.0 µg (2.50ng) | | 800 µl from tube #4 | 1200 µl |
| 6 | 0.5 µg (1.25ng) | | 1000 µl from tube #5 | 1000 µl |
| 7 | 0.25 µg (0.625ng) | | 700µl from tube #6 | 700 µl |

**Table 2: Microtiter Plate Template**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **A** | Blk | Blk | ? 1 | ? 1 | ? 9 | ? 9 | ? 17 | ? 17 | ? 25 | ? 25 | ? 33 | ? 33 |
| **B** | Std 1 | Std 1 | ? 2 | ? 2 | ? 10 | ? 10 | ? 18 | ? 18 | ? 26 | ? 26 | ? 34 | ? 34 |
| **C** | Std 2 | Std 2 | ? 3 | ? 3 | ? 11 | ? 11 | ? 19 | ? 19 | ? 27 | ? 27 | ? 35 | ? 35 |
| **D** | Std 3 | Std 3 | ? 4 | ? 4 | ? 12 | ? 12 | ? 20 | ? 20 | ? 28 | ? 28 | ? 36 | ? 36 |
| **E** | Std 4 | Std 4 | ? 5 | ? 5 | ? 13 | ? 13 | ? 21 | ? 21 | ? 29 | ? 29 | ? 37 | ? 37 |
| **F** | Std 5 | Std 5 | ? 6 | ? 6 | ? 14 | ? 14 | ? 22 | ? 22 | ? 30 | ? 30 | ? 38 | ? 38 |
| **G** | Std 6 | Std 6 | ? 7 | ? 7 | ? 15 | ? 15 | ? 23 | ? 23 | ? 31 | ? 31 | ? 39 | ? 39 |
| **H** | Std 7 | Std 7 | ? 8 | ? 8 | ? 16 | ? 16 | ? 24 | ? 24 | ? 32 | ? 32 | ? 40 | ? 40 |

Blk= Blank; Std= Standard; ? = Unknowns

**Table 3: Sample Values for GFAP Standard Curve**

| PLATE BLANK | Well | OD | Mean | Std Dev | CV |
|---|---|---|---|---|---|
| **BL** | A1 | 0.001 | 0.0 | 0.001 | 0.0 |
| | A2 | -0.001 | | | |

| STANDARDS µg total protein (ng GFAP) | Value | Well | OD | Mean | Std Dev | CV |
|---|---|---|---|---|---|---|
| **STD01** | 10µg (25.00ng) | B1 | 1.694 | 1.632 | 0.087 | 5.4 |
| | | B2 | 1.570 | | | |
| **STD02** | 7.5 µg (18.75ng) | C1 | 1.537 | 1.543 | 0.008 | 0.5 |
| | | C2 | 1.549 | | | |
| **STD03** | 5.0µg (12.50ng) | D1 | 1.295 | 1.314 | 0.027 | 2.1 |
| | | D2 | 1.334 | | | |
| **STD04** | 2.5µg (6.25ng) | E1 | 0.857 | 0.859 | 0.002 | 0.3 |
| | | E2 | 0.861 | | | |
| **STD05** | 1.0 µg (2.50ng) | F1 | 0.386 | 0.386 | 0.000 | 0.1 |
| | | F2 | 0.386 | | | |
| **STD06** | 0.5 µg (1.25ng) | G1 | 0.175 | 0.164 | 0.016 | 10.0 |
| | | G2 | 0.152 | | | |
| **STD07** | 0.25 µg (.625ng) | H1 | 0.072 | 0.076 | 0.006 | 7.6 |
| | | H2 | 0.080 | | | |

BL=Blank; STD=Standard; OD=Optical Density; Std Dev=Standard Deviation; CV=Coefficient of Variation

**Table 4: Troubleshooting Guide**

| Problem | Possible Cause | Solution |
|---|---|---|
| No color reaction | Incorrect preparation of color reagent | If color reaction has not been terminated, remove reagent, add new color reagent and continue assay |
| | Antibody was not as specified in the protocol | Obtain correct antibody and repeat assay |
| | One or more antibodies were omitted or used at the wrong dilution | Repeat assay with proper reagents used at the correct dilutions |
| Color reaction abnormally low | Incubator was set at less that 37°C | Repeat assay with incubator temperature set at 37°C |
| | Antibody solution too dilute; incorrect preparation of color reagent | Repeat assay with correct reagent dilutions |
| Color reaction abnormally high | P-nitrophenylphosphate substrate kit is too old | Repeat assay with fresh kit |
| | Color reaction was not terminated | Repeat assay and terminate reaction with 0.4 N NaOH |
| Standard curve not sigmoid | Incorrect plate template set in the plate reader | Use correct plate template and re-read plate |
| | Incorrect standard dilution | Repeat assay with correct standard dilution |
| Samples not on linear portion of curve | Incorrect standard dilution | Repeat assay with correct dilution of standard |
| | Incorrect sample dilution | Run multiple dilutions of samples to obtain OD values from the linear portion of the curve |
| Duplicates are not similar | Carry over from using same tip | Change tips after each use |
| | Poor pipetting technique | Check precision by weighing |
| | Plate washer malfunction | Check plate washer for even dispensing and aspiration |
| | Bubbles throughout the plate | Pop bubbles and re-read plate |
| Color reaction obtained for standards and samples, but OD values not as expected | Plate read at incorrect wavelength | Read plate at 405 nm |

Table 5: Mean GFAP Levels in Specific Regions of Male Rat Brains Following a 13-Week Whole -Body Inhalation Exposure to Gasoline Isobutanol Vapor Condensate

| Brain Area | Group I Air Control 0 mg/m$^3$ | Group II Test Substance 2,000 mg/m$^3$ | Group III Test Substance 10,000 mg/m$^3$ | Group IV Test Substance 20,000 mg/m$^3$ |
|---|---|---|---|---|
| Striatum | 1.05 ± 0.11* | 0.86 ± 0.02 | 0.89 ± 0.08 | 1.12 ± 0.07 |
| Hippocampus | 3.59 ± 0.23 | 3.28 ± 0.13 | 3.23 ± 0.10 | 3.51 ± 0.10 |
| Cortex | 1.02 ± 0.06 | 0.93 ± 0.03 | 0.95 ± 0.07 | 1.09 ± 0.04 |
| Olfactory Bulb | 2.49 ± 0.22 | 2.33 ± 0.11 | 1.89 ± 0.06 | 2.21 ± 0.11 |
| Thalamus | 4.08 ± 0.43 | 4.01 ± 0.49 | 3.24 ± 0.76 | 3.57 ± 0.51 |
| Hypothalamus | 6.70 ± 0.54 | 7.11 ± 0.54 | 6.16 ± 1.23 | 7.09 ± 0.80 |
| Cerebellum | 3.71 ± 0.17 | 3.34 ± 0.16 | 3.55 ± 0.09 | 3.70 ± 0.22 |
| Rest of Brain | 3.39 ± 0.51 | 3.22 ± 0.39 | 3.05 ± 0.25 | 3.02 ± 0.39 |

*Each value represents the mean ± SEM (Standard Error of Mean) for the concentration of GFAP (µg/mg Total Protein)
n= 5; see Results and Conclusion and Table 7

Table 6: Mean GFAP Levels in Specific Regions of Female Rat Brains Following a 13-Week Whole -Body Inhalation Exposure to Gasoline Isobutanol Vapor Condensate

| Brain Area | Group I Air Control 0 mg/m$^3$ | Group II Test Substance 2,000 mg/m$^3$ | Group III Test Substance 10,000 mg/m$^3$ | Group IV Test Substance 20,000 mg/m$^3$ |
|---|---|---|---|---|
| Striatum | 0.88 ± 0.06* | 0.82± 0.05 | 0.87± 0.07 | 0.94± 0.08 |
| Hippocampus | 3.36 ± 0.13 | 3.46 ± 0.22 | 3.30 ± 0.11 | 3.43 ± 0.08 |
| Cortex | 1.01 ± 0.11 | 0.97 ± 0.07 | 0.89 ± 0.04 | 0.99 ± 0.03 |
| Olfactory Bulb | 2.19 ± 0.13 | 2.23 ± 0.17 | 2.23 ± 0.18 | 2.09 ± 0.11 |
| Thalamus | 4.32 ± 0.39 | 3.80 ± 0.76 | 4.49 ± 0.87 | 4.70 ± 0.43 |
| Hypothalamus | 6.39 ± 1.14 | 6.94 ± 0.59 | 6.25 ± 0.49 | 6.45 ± 1.04 |
| Cerebellum | 3.53 ± 0.32 | 3.61 ± 0.31 | 3.27 ± 0.18 | 3.48 ± 0.23 |
| Rest of Brain | 2.61 ± 0.19 | 2.81 ± 0.08 | 2.96 ± 0.24 | 2.92 ± 0.16 |

*Each value represents the mean ± SEM (Standard Error of Mean) for the concentration of GFAP (µg/mg Total Protein)

Table 7: Individual GFAP Levels in Specific Regions of Rat Brains Following a 13 Week Whole-Body Inhalation Exposure to Gasoline Isobutanol Vapor Condensate

| Group | Animal no. | Sex | Striatum | Hippocampus | Cortex | Olfactory Bulb | Thalamus | Hypothalamus | Cerebellum | Rest of Brain |
|---|---|---|---|---|---|---|---|---|---|---|
| Group I Air Control 0 mg/m3 | 1026 | Male | 1.407◊ | 3.888 | 1.000 | 2.933 | 3.882 | 6.229 | 3.674 | 5.401 |
| | 1027 | | 0.863 | 3.515 | 0.841 | 2.847 | 2.876 | 8.819 | 3.678 | 3.037 |
| | 1028 | | 1.106 | 4.297 | 1.230 | 2.760 | 3.517 | 5.847 | 3.644 | 3.168 |
| | 1029 | | 0.758 | 3.004 | 1.059 | 2.000 | 5.219 | 6.371 | 3.270 | 2.654 |
| | 1030 | | 1.112 | 3.233 | 0.990 | 1.899 | 4.885 | 6.239 | 4.306 | 2.701 |
| | 1526 | Female | 0.965 | 3.259 | 1.032 | 2.375 | 3.532 | 3.001 | 3.744 | 2.444 |
| | 1527 | | 1.045 | 3.469 | 0.951 | 2.563 | 5.177 | 10.127 | 4.520 | 3.065 |
| | 1528 | | 0.699 | 3.102 | 0.963 | 2.140 | 3.234 | 5.850 | 3.070 | 2.504 |
| | 1529 | | 0.917 | 3.811 | 1.377 | 2.040 | 4.877 | 6.248 | 3.649 | 2.991 |
| | 1530 | | 0.765 | 3.153 | 0.722 | 1.830 | 4.772 | 6.711 | 2.646 | 2.051 |
| Group II Isobutanol Vapor 2,000 mg/m3 | 2026 | Male | 0.823 | 3.390 | 0.963 | 2.266 | 2.091 | 7.082 | 3.286 | 3.009 |
| | 2027 | | 0.816 | 3.238 | 0.918 | 2.515 | 4.307 | 9.185 | 2.981 | 2.800 |
| | 2028 | | 0.865 | 3.532 | 1.032 | 2.362 | 4.252 | 6.479 | 3.426 | 2.957 |
| | 2029 | | 0.877 | 2.802 | 0.838 | 1.961 | 4.933 | 6.233 | 3.085 | 4.751 |
| | 2023 | | 0.916 | 3.421 | 0.907 | 2.562 | 4.468 | 6.550 | 3.905 | 2.576 |
| | 2526 | Female | 0.808 | 3.537 | 0.885 | 2.053 | 4.454 | 7.199 | 4.506 | 2.736 |
| | 2527 | | 0.769 | 2.924 | 0.957 | 2.211 | 5.821 | 6.546 | 3.340 | 2.646 |
| | 2528 | | 0.989 | 4.044 | 1.087 | 2.851 | 3.095 | 8.432 | 4.124 | 2.952 |
| | 2529 | | 0.852 | 3.792 | 1.152 | 2.179 | 1.321 | 5.602 | 3.262 | 3.060 |
| | 2530 | | 0.703 | 3.010 | 0.744 | 1.875 | 4.301 | * | 2.807 | 2.648 |
| Group III Isobutanol Vapor 10,000 mg/m3 | 3026 | Male | 0.871 | 2.904 | 0.868 | 2.110 | 3.911 | 3.749 | 3.694 | 3.022 |
| | 3027 | | 0.985 | 3.268 | 0.913 | 1.791 | 4.523 | 2.909 | 3.337 | 3.436 |
| | 3028 | | 0.627 | 3.091 | 0.858 | 1.931 | 1.293 | 6.575 | 3.542 | 2.539 |
| | 3029 | | 0.859 | 3.463 | 1.231 | 1.761 | 4.889 | 8.886 | 3.408 | 3.761 |
| | 3030 | | 1.110 | 3.409 | 0.871 | 1.862 | 1.561 | 8.668 | 3.788 | 2.506 |
| | 3526 | Female | 0.732 | 3.123 | 0.799 | 2.748 | 1.399 | 7.147 | 3.843 | 2.981 |
| | 3527 | | 0.778 | 3.022 | 0.818 | 2.268 | 4.588 | 5.785 | 3.238 | 2.434 |
| | 3528 | | 1.057 | 3.459 | 0.915 | 2.439 | 4.239 | 5.004 | 3.225 | 3.546 |
| | 1530 | | 0.782 | 3.628 | 0.974 | 2.050 | 5.781 | 7.612 | 2.694 | 2.409 |
| | 3530 | | 1.007 | 3.260 | 0.959 | 1.667 | 6.421 | 5.696 | 3.328 | 3.451 |
| Group IV Isobutanol Vapor 20,000 mg/m3 | 4026 | Male | 1.092 | 3.445 | 1.059 | 2.582 | 4.699 | 8.680 | 3.229 | 2.643 |
| | 4027 | | 1.274 | 3.696 | 1.083 | 2.313 | 4.627 | 8.165 | 3.383 | 3.513 |
| | 4028 | | 0.893 | 3.160 | 0.997 | 2.066 | 3.734 | 6.158 | 3.747 | 2.190 |
| | 4029 | | 1.266 | 3.702 | 1.247 | 1.957 | 2.534 | 8.026 | 3.648 | 4.319 |
| | 4030 | | 1.084 | 3.526 | 1.065 | 2.129 | 2.281 | 4.399 | 4.471 | 2.441 |
| | 4526 | Female | 1.066 | 3.468 | 1.049 | 2.495 | 4.331 | 5.481 | 4.105 | 3.318 |
| | 4527 | | 0.821 | 3.503 | 0.974 | 2.127 | 3.629 | 4.981 | 3.698 | 2.336 |
| | 4528 | | 1.185 | 3.542 | 1.077 | 1.993 | 5.187 | 10.572 | 3.646 | 2.919 |
| | 4529 | | 0.794 | 3.120 | 0.881 | 1.870 | 6.088 | 5.347 | 2.832 | 2.921 |
| | 4530 | | 0.848 | 3.529 | 0.993 | 1.987 | 4.258 | 5.846 | 3.108 | 3.114 |

◊ Each value represents the concentration of GFAP (µg/mg Total Protein)

* Hypothalamus lost during dissection

**Table 8:** Individual GFAP Levels in OB Following 13-Week Whole-Body Inhalation Exposure to Gasoline Isobutanol Vapor Condensate compared to individual GFAP Levels In Hippocampus Following a Single Administration of Trimethlytin (TMT) Used as a GFAP Assay Positive Control

| Group | Brain Area | Animal no. | GFAP (µg/mg Total Protein) | Average GFAP (µg/mg Total Protein) |
|---|---|---|---|---|
| Saline Control | Hippocampus | 1 | 1.990 | 1.660 |
| | | 2 | 1.567 | |
| | | 3 | 1.167 | |
| | | 4 | 1.915 | |
| TMT Positive Control | | 6 | 14.188 | 10.596 |
| | | 7 | 10.968 | |
| | | 9 | 9.195 | |
| | | 10 | 8.034 | |
| Group I Air Control 0 mg/m3 | Olfactory Bulbs | 1026 | 2.363 | 2.529 |
| | | 1027 | 2.730 | |
| | | 1028 | 2.886 | |
| | | 1029 | 2.135 | |
| Group II Isobutanol Vapor 2,000 mg/m3 | | 2026 | 1.905 | 2.078 |
| | | 2027 | 2.098 | |
| | | 2028 | 2.371 | |
| | | 2029 | 1.938 | |
| Group III Isobutanol Vapor 10,000 mg/m3 | | 3026 | 1.646 | 1.755 |
| | | 3027 | 1.671 | |
| | | 3028 | 1.836 | |
| | | 3029 | 1.866 | |
| Group IV Isobutanol Vapor 20,000 mg/m3 | | 4026 | 2.219 | 2.061 |
| | | 4027 | 2.154 | |
| | | 4028 | 2.035 | |
| | | 4029 | 1.838 | |

TMT was administered to male Long-Evans rats at a single dosage of 8.0 mg/kg, i.p.. Rats were sacrificed at 14 days post dosing, hippocampus was dissected free-hand as per the studies on Gasoline Isobutanol Vapor Condensate. OB samples described in Tables 6 & 7 were re-assayed for GFAP along with the homogenates from the TMT-treated hippocampal samples.

# Annex 10 Neurohistopathology phase report

# NEUROHISTOPATHOLOGY PHASE REPORT

## Gasoline Isobutanol Vapor Condensate: A 13 Week Inhalation (Whole-Body) Toxicity Study In Rats With Neurotoxicity, Genotoxicity And Immunotoxicity Assessments And With A 4 Week Recovery

| | |
|---|---|
| **Envigo reference number:** | HUD0486 |
| **Sponsor study number:** | 14-6485 |
| **Version ID:** | Final Report |
| **Issue date:** | 24 March 2016 |

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Sponsor study number: 14-6485
Envigo: HUD0486

# Compliance with Good Laboratory Practice

## Gasoline Isobutanol Vapor Condensate: A 13 Week Inhalation (Whole-Body) Toxicity Study In Rats With Neurotoxicity, Genotoxicity And Immunotoxicity Assessments And With A 4 Week Recovery – Neurohistopathology phase

The study phase described in this report was conducted in compliance with the following Good Laboratory Practice standards and I consider the data generated to be valid.

The UK Good Laboratory Practice Regulations (Statutory Instrument 1999 No. 3106, as amended by Statutory Instrument 2004 No. 994).

OECD Principles of Good Laboratory Practice (as revised in 1997), ENV/MC/CHEM(98)17.

EC Commission Directive 2004/10/EC of 11 February 2004 (Official Journal No. L 50/44).

These principles of Good Laboratory Practice (GLP) are accepted by the regulatory authorities of the United States of America and Japan on the basis of intergovernmental agreements.

The identity of treatment groups from the study work performed at the Test Facility are included in this phase report for reference only. No claim of GLP compliance is made.

[redacted]

Jane Schofield BSc (Hons), PG Dip, RSci
Principal Investigator
Envigo

24. March 2016
Date

# Quality Assurance Statement

## Gasoline Isobutanol Vapor Condensate: A 13 Week Inhalation (Whole-Body) Toxicity Study In Rats With Neurotoxicity, Genotoxicity And Immunotoxicity Assessments And With A 4 Week Recovery – Neurohistopathology phase

The following inspections and audits have been carried out in relation to the phase of the study conducted at Envigo (Eye) UK:

| Study Phase | Date(s) of Inspection | Date of Reporting to Principal Investigator and Test Site Management | Date of Reporting to Study Director, Test Facility Management and Lead QA |
|---|---|---|---|
| Protocol Audit | 03 Mar 2015 | 03 Mar 2015 | 03 Mar 2015 |
| Protocol Amendment No.3 | 10 Jun 2015 | 10 Jun 2015 | 10 Jun 2015 |
| Protocol Amendment No.4 | 07 Jul 2015 | 07 Jul 2015 | 07 Jul 2015 |
| Neurohistopathology Phase Report Audit | 18 Sep 2015 - 28 Sep 2015 | 28 Sep 2015 | 28 Sep 2015 |

**Process based inspections**: At or about the time this study was in progress inspections of procedures employed on this type of study were carried out. These were conducted and reported to appropriate Company Management as indicated below:

| Process Based Inspections | Date(s) of Inspection | Date of Reporting to Management |
|---|---|---|
| Sectioning/Slide preparation, Staining, Slide collation | 16 Jun 2015, 07 Jul 2015 | 07 Jul 2015 |
| Histology processes including Tissue trimming and Decalcification, Tissue processing, Tissue embedding | 22 Sep 2015 | 22 Sep 2015 |
| Slide reading | 24 Jun 2015 | 29 Jun 2015 |

In addition, an inspection of the facility where this study was conducted was carried out on an annual basis. These inspections were reported to Company Management.

[redacted]

Chris Jeffs MRQA
Lead Auditor
Department of Quality Assurance
Envigo

24 MARCH 2016
Date

Sponsor study number: 14-6485
Envigo: HUD0486

## Contributing Scientist, Pathology Signature Page

**Gasoline Isobutanol Vapor Condensate: A 13 Week Inhalation (Whole-Body) Toxicity Study In Rats With Neurotoxicity, Genotoxicity And Immunotoxicity Assessments And With A 4 Week Recovery – Neurohistopathology phase**

[redacted]

Ian Taylor BSc DIBT CBiol MRSB
Study Pathologist
Envigo

24 MARCH 2016
Date

# Details of Sponsor, Test Facility and Test Site

| | |
|---|---|
| **Sponsor** | Butamax Advanced Biofuels, LLC<br>200 Powder Mill Road<br>E356 Third Floor<br>Wilmington<br>DE<br>19880-0356 |
| **Test facility**<br>(Primary location) | Envigo CRS Inc.<br>Princeton<br>100 Mettlers Road<br>Somerset<br>NJ 08873<br>USA |
| **Test site**<br>(Necropsy, Histology and Pathology) | Envigo CRS Limited<br>Eye<br>Suffolk<br>IP23 7PX<br>UK |
| **Test site**<br>(Special Pathology Services) | Envigo CRS Limited<br>Huntingdon<br>Woolley Road<br>Alconbury<br>Huntingdon<br>Cambridgeshire<br>PE28 4HS<br>UK |

## Contributing Scientists

| | |
|---|---|
| **Principal Investigator** | Jane Schofield |
| **Pathology** | Ian Taylor<br>Associate Director of Pathology |
| **Pathology Peer Review** | Vasanthi Mowat<br>Director of Pathology |

## Summary

This phase of the study was performed to undertake histological processing and pathological evaluation of the fixed tissues from the neuropathology animals from a study performed at Envigo, Princeton to assess the toxic potential of the test article, Gasoline Isobutanol Vapor Condensate, when administered via inhalation, to male and female rats for 13 weeks.

| Group | Treatment (a) | Exposure Level | Number of animals | |
|---|---|---|---|---|
| | | | Males | Females |
| 1 | Air Control | 0 mg/m$^3$ | 5 | 5 |
| 2 | Gasoline Isobutanol Vapor Condensate | 2,000 mg/m$^3$ | 5 | 5 |
| 3 | Gasoline Isobutanol Vapor Condensate | 10,000 mg/m$^3$ | 5 | 5 |
| 4 | Gasoline Isobutanol Vapor Condensate | 20,000 mg/m$^3$ | 5 | 5 |

a Inhalation exposure levels are expressed as mg/m3 of test substance

This study was conducted at the Princeton facility of Envigo CRS Inc.
Histological processing, including brain weight and measurements, and pathological evaluation of tissues were conducted at the Eye site of Envigo CRS Limited. Resin processing was conducted at the Huntingdon site of Envigo CRS Limited.

### Results

There were no findings in the tissues examined from the neurohistopathology phase of this study which were considered to be related to treatment with Gasoline Isobutanol Vapor Condensate.

There were no effects of treatment on the weight or size of the brains of animals treated with Gasoline Isobutanol Vapor Condensate compared to controls.

### Conclusion

Following a 13 week inhalation (whole body) exposure of CD rats to Gasoline Isobutanol Vapor Condensate, there were no findings in the tissues examined from the neurohistopathology phase of this study which were considered to be related to treatment.

# 1. Introduction

## 1.1 Objective

This phase of the study was performed to undertake tissue collection, brain measurements and weight, histological processing and pathological evaluation of the fixed tissues from the neuropathology animals from a study performed at Envigo, Princeton to assess the toxic potential of the test article, Gasoline Isobutanol Vapor Condensate, when administered via inhalation, to male and female rats for 13 weeks.

This study was conducted at the Princeton facility of Envigo CRS Inc.
Tissue collection, brain measurements and weights, histological processing and pathological evaluation of tissues were conducted at the Eye site of Envigo CRS Limited. Resin processing was conducted at the Huntingdon site of Envigo CRS Limited.

# 2. Experimental Procedure

## 2.1 Study schedule and structure

### 2.1.1 Time schedule

Study initiation: (Protocol signed by Study Director) — 03 February 2015

Neurohistopathology phase start: (Start of data recording) — 07 July 2015

Neurohistopathology phase completion: (Pathology) — 02 September 2015

Study phase completion: — When the Principal Investigator signs the final phase report

### 2.1.2 Identity of treatment groups

The study consisted of one control and three treated groups identified as follows:

| Group | Treatment (a) | Exposure Level | Number of animals | |
|---|---|---|---|---|
| | | | Males | Females |
| 1 | Air Control | 0 mg/m$^3$ | 5 | 5 |
| 2 | Gasoline Isobutanol Vapor Condensate | 2,000 mg/m$^3$ | 5 | 5 |
| 3 | Gasoline Isobutanol Vapor Condensate | 10,000 mg/m$^3$ | 5 | 5 |
| 4 | Gasoline Isobutanol Vapor Condensate | 20,000 mg/m$^3$ | 5 | 5 |

a Inhalation exposure levels are expressed as mg/m3 of test substance

## 2.2 Terminal Procedures

All neuropathology study animals were subject to perfusion fixation, tissue retention and preservation in appropriate fixative at the Envigo, Princeton Test Facility.

Tissues were dissected from the carcass, with the brain measured and weighed, at the Test Site.

The tissue samples processed and sections examined microscopically as part of the neurohistopathology phase of the study are detailed as follows:

| **Tissue and regions examined** | **Histology** | **Pathology** |
|---|---|---|
| | | **Light microscopy** |
| Brain (forebrain, central cerebrum, hippocampus, basal ganglia, midbrain, cerebellum and pons, medulla) | * | * |
| Eye with optic nerve | * | * |
| Spinal cord (cervical, thoracic, lumbar, cross and longitudinal sections) | * | * |
| Sciatic nerve (cross and longitudinal sections) | * | * |
| Tibial nerve (cross and longitudinal sections) | * | * |
| Sural nerve (cross and longitudinal sections) | * | * |
| Trigeminal ganglia | * | * |
| Dorsal root ganglia (from C3-C6 and L1- L4) | * | * |
| Dorsal root fibres (from C3-C6 and L1- L4) | * | * |
| Ventral root fibres (from C3-C6 and L1- L4) | * | * |
| Lungs and trachea | * | * |

The brain for each animal was weighed and measured post fixation at the Test Site.

### 2.2.1 Histology

| | |
|---|---|
| Processing | Paraffin processing. Tissue samples were dehydrated, embedded in paraffin wax and sectioned at a nominal six micron thickness. For bilateral organs, sections of both organs were prepared. A single section was prepared from each of the remaining tissues required.<br><br>Resin processing. Peripheral nerves were post fixed in 1% osmium tetroxide, processed and embedded in epoxy resin and sectioned at a nominal two micron thickness. |
| Full List | Neurohistopathology study animals of Groups 1 and 4 euthanized at termination. |
| Lung and trachea | All neurohistopathology study animals of Groups 2 and 3 euthanized at termination. |
| Routine staining | Paraffin sections were stained with haematoxylin and eosin. Resin sections were stained with toluidine blue. |

### 2.2.2 Light microscopy

Tissues preserved for examination were examined as follows:

| Category | Animals | Tissues |
|---|---|---|
| Scheduled kill | Neurohistopathology study All animals of Groups 1 to 4. | All specified in Section 2.2. |

Findings were either reported as "present" or assigned a severity grade. In the latter case one of the following five grades was used - minimal, slight, moderate, marked or severe. A reviewing pathologist undertook a peer review of the microscopic findings.

Tissues preserved for examination were examined for all animals sacrificed on completion of the scheduled treatment period.

## 2.3 Computer systems

| System name* | System function |
|---|---|
| Liberate Global | In-house system used for reporting necropsy observations and pathology**. |
| Xybion Pristima | Used for tissue collection, brain measurement and weight recording and pathology data collection and reporting. |

* All version numbers of the systems are maintained by Envigo

** Prints identified using a unique request ID reference number.

## 2.4 Quality assurance and archiving procedures

### 2.4.1 Quality assurance

Details of the Quality Assurance inspections and audits undertaken at Envigo CRS Limited are presented on the Quality Assurance Statement.

### 2.4.2 Archiving procedures

Following completion of this study phase the final phase report, all raw data, Principal Investigator study file, specimens and samples were returned to the Test Facility.

At the Test Site a copy of the final phase report will be retained indefinitely and all Quality Assurance inspection records for a period of 20 years.

## 2.5 Deviations from protocol

The following deviations from protocol occurred:

> Contrary to section 10.1 of the study protocol, macroscopic observations were not recorded for the neurohistopathology animals in error. The microscopic evaluation of the processed tissues revealed no test article related effects.

These deviations were considered to have not affected the integrity or validity of the study.

# 3. Results

## 3.1 Histopathology

Table 1, Appendix 1

### 3.1.1 Test Article-Related Findings

There were no findings in the tissues examined from the neurohistopathology phase of this study which were considered to be related to treatment with Gasoline Isobutanol Vapor Condensate.

### 3.1.2 Miscellaneous Findings

All histopathology findings in the neuropathology animals were considered to be incidental and unrelated to treatment with Gasoline Isobutanol Vapor Condensate.

## 3.2 Brain measurements

Table 2, Appendix 2

The brains from all animals assigned to the neurohistopathology phase of the study were weighed and measured post-fixation. There were no effects of treatment on the weight or size of the brains of animals treated with Gasoline Isobutanol Vapor Condensate compared to controls.

# 4. Discussion

Examination of the peripheral nerves revealed a variable incidence of minimal degenerative changes in these tissues. These changes occurred at similar incidences in control and high exposure animals and were considered unrelated to treatment.

# 5. Conclusion

Following a 13 week inhalation (whole body) exposure of CD rats to Gasoline Isobutanol Vapor Condensate, there were no findings in the tissues examined from the neurohistopathology phase of this study which were considered to be related to treatment.

Sponsor study number: 14-6485
Envigo: HUD0486

TABLE 1 Neuropathology - group distribution of findings for all animals Request ID: 5086525

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Group | 1 | 2 | 3 | 4 |
| Exposure Level (mg/m3) | 0 | 2000 | 10000 | 20000 |

| | | Number of animals affected | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group/Sex | 1M | 2M | 3M | 4M | 1F | 2F | 3F | 4F |
| Tissue/Organ and Findings | No. of animals | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Brain, Cerebellum + Pons | No. examined | 5 | 0 | 0 | 5 | 5 | 0 | 0 | 5 |
| Brain, Cerebrum | No. examined | 5 | 0 | 0 | 5 | 5 | 0 | 0 | 5 |
| Brain, Forebrain | No. examined | 5 | 0 | 0 | 5 | 5 | 0 | 0 | 5 |
| Brain, Medulla Oblongata | No. examined | 5 | 0 | 0 | 5 | 5 | 0 | 0 | 5 |
| Brain, Midbrain | No. examined | 5 | 0 | 0 | 5 | 5 | 0 | 0 | 5 |
| Brain, Olfactory Bulbs | No. examined | 5 | 0 | 0 | 5 | 5 | 0 | 0 | 5 |
| DandV Root Fibers Cervical | No. examined | 5 | 0 | 0 | 5 | 5 | 0 | 0 | 5 |
| DandV Root Fibers Lumbar | No. examined | 5 | 0 | 0 | 5 | 5 | 0 | 0 | 5 |
| Eyes | No. examined | 5 | 0 | 0 | 5 | 5 | 0 | 0 | 5 |

Sponsor study number: 14-6485
Envigo: HUD0486

TABLE 1 (cont) Neuropathology - group distribution of findings for all animals Request ID: 5086525

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Group | 1 | 2 | 3 | 4 |
| Exposure Level (mg/m3) | 0 | 2000 | 10000 | 20000 |

| | | Number of animals affected | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group/Sex | 1M | 2M | 3M | 4M | 1F | 2F | 3F | 4F |
| Tissue/Organ and Findings | No. of animals | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Ganglia, Dorsal Cervical | No. examined | 5 | 0 | 0 | 5 | 5 | 0 | 0 | 5 |
| Ganglia, Dorsal Lumbar | No. examined | 5 | 0 | 0 | 5 | 5 | 0 | 0 | 5 |
| Ganglia, Trigeminal | No. examined | 5 | 0 | 0 | 5 | 5 | 0 | 0 | 5 |
| Lungs and Bronchi | No. examined | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Alveolar Macrophages, Foamy | Minimal | 1 | 1 | 2 | 1 | 0 | 1 | 0 | 0 |
| | Total | 1 | 1 | 2 | 1 | 0 | 1 | 0 | 0 |
| Nerve, Optic | No. examined | 5 | 0 | 0 | 5 | 5 | 0 | 0 | 4 |
| Nerve, Sciatic | No. examined | 5 | 0 | 0 | 5 | 5 | 0 | 0 | 5 |
| Degeneration, Axonal | Minimal | 1 | 0 | 0 | 2 | 2 | 0 | 0 | 1 |
| | Total | 1 | 0 | 0 | 2 | 2 | 0 | 0 | 1 |
| Nerve, Sural | No. examined | 5 | 0 | 0 | 5 | 5 | 0 | 0 | 5 |
| Degeneration, Axon | Minimal | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sponsor study number: 14-6485
Envigo: HUD0486

TABLE 1 (cont) Neuropathology - group distribution of findings for all animals Request ID: 5086525

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Group | 1 | 2 | 3 | 4 |
| Exposure Level (mg/m3) | 0 | 2000 | 10000 | 20000 |

| | | Number of animals affected | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group/Sex | 1M | 2M | 3M | 4M | 1F | 2F | 3F | 4F |
| Tissue/Organ and Findings | No. of animals | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Nerve, Tibial | No. examined | 5 | 0 | 0 | 5 | 5 | 0 | 0 | 5 |
| Degeneration, Axon | Minimal | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | Total | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Spinal Cord Cervical | No. examined | 5 | 0 | 0 | 5 | 5 | 0 | 0 | 5 |
| Spinal Cord Lumbar | No. examined | 5 | 0 | 0 | 5 | 5 | 0 | 0 | 5 |
| Spinal Cord Thoracic | No. examined | 5 | 0 | 0 | 5 | 5 | 0 | 0 | 5 |
| Trachea | No. examined | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |

TABLE 2 Neuropathology - Brain dimensions – Group mean values for all animals

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Group | 1 | 2 | 3 | 4 |
| Exposure Level (mg/m3) | 0 | 2000 | 10000 | 20000 |

| Group/ Sex | | Brain (g) | Brain length (mm) | Brain width (mm) |
|---|---|---|---|---|
| 1M | Mean | 1.935 | 21.78 | 16.04 |
| | SD | 0.213 | 0.432 | 0.611 |
| | N | 5 | 5 | 5 |
| 2M | Mean | 1.950 | 21.68 | 16.00 |
| | SD | 0.121 | 0.517 | 0.644 |
| | N | 5 | 5 | 5 |
| 3M | Mean | 1.920 | 22.02 | 15.48 |
| | SD | 0.198 | 0.965 | 0.782 |
| | N | 5 | 5 | 5 |
| 4M | Mean | 1.915 | 21.88 | 15.92 |
| | SD | 0.164 | 0.622 | 0.363 |
| | N | 5 | 5 | 5 |

TABLE 2 (cont) Neuropathology - Brain dimensions – Group mean values for all animals

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Group | 1 | 2 | 3 | 4 |
| Exposure Level (mg/m3) | 0 | 2000 | 10000 | 20000 |

| Group/ Sex | | Brain (g) | Brain length (mm) | Brain width (mm) |
|---|---|---|---|---|
| 1F | Mean | 1.698 | 21.12 | 15.34 |
| | SD | 0.026 | 0.415 | 0.207 |
| | N | 5 | 5 | 5 |
| 2F | Mean | 1.707 | 21.30 | 15.20 |
| | SD | 0.083 | 0.292 | 0.245 |
| | N | 5 | 5 | 5 |
| 3F | Mean | 1.714 | 20.80 | 15.32 |
| | SD | 0.102 | 0.316 | 0.228 |
| | N | 5 | 5 | 5 |
| 4F | Mean | 1.741 | 20.72 | 15.06 |
| | SD | 0.108 | 0.650 | 0.329 |
| | N | 5 | 5 | 5 |

Sponsor study number: 14-6485
Envigo: HUD0486

APPENDIX 1 Neuropathology - individual findings for all animals Request ID: 5086539

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Group | 1 | 2 | 3 | 4 |
| Exposure Level (mg/m3) | 0 | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Tissue | Findings |
|---|---|---|---|---|---|
| 1M | 1021 | 95 (14) | Treatment | All examined tissues | No histopathology findings |
| | 1022 | 95 (14) | Treatment | Nerve, Tibial | Degeneration, Axon, minimal |
| | 1023 | 95 (14) | Treatment | All examined tissues | No histopathology findings |
| | 1024 | 95 (14) | Treatment | Lungs and Bronchi | Alveolar Macrophages, Foamy, minimal, multifocal |
| | 1025 | 95 (14) | Treatment | Nerve, Sciatic | Degeneration, Axonal, minimal |
| | | | | Nerve, Sural | Degeneration, Axon, minimal |
| 2M | 2021 | 95 (14) | Treatment | Lungs and Bronchi | Alveolar Macrophages, Foamy, minimal |
| | 2022 | 95 (14) | Treatment | All examined tissues | No histopathology findings |
| | 2023 | 95 (14) | Treatment | All examined tissues | No histopathology findings |
| | 2024 | 95 (14) | Treatment | All examined tissues | No histopathology findings |
| | 2025 | 95 (14) | Treatment | All examined tissues | No histopathology findings |
| 3M | 3021 | 95 (14) | Treatment | Lungs and Bronchi | Alveolar Macrophages, Foamy, minimal |

Sponsor study number: 14-6485
Envigo: HUD0486

APPENDIX 1 (cont) Neuropathology - individual findings for all animals Request ID: 5086539

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Group | 1 | 2 | 3 | 4 |
| Exposure Level (mg/m3) | 0 | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Tissue | Findings |
|---|---|---|---|---|---|
| 3M | 3022 | 95 (14) | Treatment | All examined tissues | No histopathology findings |
| | 3023 | 95 (14) | Treatment | All examined tissues | No histopathology findings |
| | 3024 | 95 (14) | Treatment | Lungs and Bronchi | Alveolar Macrophages, Foamy, minimal, multifocal |
| | 3025 | 95 (14) | Treatment | All examined tissues | No histopathology findings |
| 4M | 4021 | 95 (14) | Treatment | Nerve, Sciatic | Degeneration, Axonal, minimal |
| | 4022 | 95 (14) | Treatment | Lungs and Bronchi | Alveolar Macrophages, Foamy, minimal |
| | 4023 | 95 (14) | Treatment | Nerve, Sciatic | Degeneration, Axonal, minimal |
| | 4024 | 95 (14) | Treatment | All examined tissues | No histopathology findings |
| | 4025 | 95 (14) | Treatment | Nerve, Tibial | Degeneration, Axon, minimal |

APPENDIX 1 (cont) Neuropathology - individual findings for all animals Request ID: 5086539

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Group | 1 | 2 | 3 | 4 |
| Exposure Level (mg/m3) | 0 | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Tissue | Findings |
|---|---|---|---|---|---|
| 1F | 1521 | 95 (14) | Treatment | All examined tissues | No histopathology findings |
| | 1522 | 95 (14) | Treatment | Nerve, Sciatic | Degeneration, Axonal, minimal |
| | 1523 | 95 (14) | Treatment | Nerve, Sciatic | Degeneration, Axonal, minimal |
| | 1524 | 95 (14) | Treatment | All examined tissues | No histopathology findings |
| | 1525 | 95 (14) | Treatment | All examined tissues | No histopathology findings |
| 2F | 2521 | 95 (14) | Treatment | Lungs and Bronchi | Alveolar Macrophages, Foamy, minimal |
| | 2522 | 95 (14) | Treatment | All examined tissues | No histopathology findings |
| | 2523 | 95 (14) | Treatment | All examined tissues | No histopathology findings |
| | 2524 | 95 (14) | Treatment | All examined tissues | No histopathology findings |
| | 2525 | 95 (14) | Treatment | All examined tissues | No histopathology findings |
| 3F | 3521 | 95 (14) | Treatment | All examined tissues | No histopathology findings |
| | 3522 | 95 (14) | Treatment | All examined tissues | No histopathology findings |

Sponsor study number: 14-6485
Envigo: HUD0486

APPENDIX 1 (cont) Neuropathology - individual findings for all animals Request ID: 5086539

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Group | 1 | 2 | 3 | 4 |
| Exposure Level (mg/m3) | 0 | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Day (Week) of Death | Phase | Tissue | Findings |
|---|---|---|---|---|---|
| 3F | 3523 | 95 (14) | Treatment | All examined tissues | No histopathology findings |
| | 3524 | 95 (14) | Treatment | All examined tissues | No histopathology findings |
| | 3525 | 95 (14) | Treatment | All examined tissues | No histopathology findings |
| 4F | 4521 | 95 (14) | Treatment | All examined tissues | No histopathology findings |
| | 4522 | 95 (14) | Treatment | Nerve, Optic | Status: Both, tissue missing |
| | 4523 | 95 (14) | Treatment | Nerve, Sciatic | Degeneration, Axonal, minimal |
| | 4524 | 95 (14) | Treatment | All examined tissues | No histopathology findings |
| | 4525 | 95 (14) | Treatment | All examined tissues | No histopathology findings |

APPENDIX 2 Neuropathology - Brain dimensions – Individual values for all animals

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Group | 1 | 2 | 3 | 4 |
| Exposure Level (mg/m3) | 0 | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Brain (g) | Brain length (mm) | Brain width (mm) |
|---|---|---|---|---|
| 1M | 1021 | 1.657 | 22.0 | 15.2 |
| | 1022 | 2.077 | 21.5 | 16.0 |
| | 1023 | 2.187 | 22.3 | 16.9 |
| | 1024 | 1.793 | 21.9 | 15.9 |
| | 1025 | 1.963 | 21.2 | 16.2 |
| 2M | 2021 | 1.930 | 21.2 | 16.2 |
| | 2022 | 1.900 | 21.8 | 16.1 |
| | 2023 | 2.008 | 22.3 | 16.6 |
| | 2024 | 2.117 | 22.0 | 16.2 |
| | 2025 | 1.794 | 21.1 | 14.9 |
| 3M | 3021 | 1.670 | 22.8 | 15.3 |
| | 3022 | 1.773 | 21.4 | 14.9 |
| | 3023 | 1.989 | 20.7 | 14.9 |
| | 3024 | 2.001 | 23.0 | 15.5 |
| | 3025 | 2.168 | 22.2 | 16.8 |
| 4M | 4021 | 2.013 | 21.7 | 16.5 |
| | 4022 | 2.108 | 22.9 | 15.5 |
| | 4023 | 1.769 | 21.4 | 15.8 |
| | 4024 | 1.962 | 22.0 | 15.9 |
| | 4025 | 1.723 | 21.4 | 15.9 |

APPENDIX 2 (cont) Neuropathology - Brain dimensions – Individual values for all animals

| | Vehicle Control | Gasoline Isobutanol Vapor Condensate | | |
|---|---|---|---|---|
| Group | 1 | 2 | 3 | 4 |
| Exposure Level (mg/m3) | 0 | 2000 | 10000 | 20000 |

| Group /Sex | Animal Number | Brain (g) | Brain length (mm) | Brain width (mm) |
|---|---|---|---|---|
| 1F | 1521 | 1.699 | 21.1 | 15.5 |
| | 1522 | 1.734 | 21.3 | 15.1 |
| | 1523 | 1.705 | 20.6 | 15.6 |
| | 1524 | 1.694 | 21.7 | 15.3 |
| | 1525 | 1.660 | 20.9 | 15.2 |
| 2F | 2521 | 1.805 | 21.1 | 15.1 |
| | 2522 | 1.766 | 21.7 | 15.1 |
| | 2523 | 1.708 | 21.5 | 15.4 |
| | 2524 | 1.658 | 21.2 | 15.5 |
| | 2525 | 1.597 | 21.0 | 14.9 |
| 3F | 3521 | 1.800 | 21.2 | 15.1 |
| | 3522 | 1.788 | 20.4 | 15.3 |
| | 3523 | 1.706 | 20.8 | 15.5 |
| | 3524 | 1.545 | 20.6 | 15.1 |
| | 3525 | 1.730 | 21.0 | 15.6 |
| 4F | 4521 | 1.781 | 19.9 | 14.7 |
| | 4522 | 1.869 | 20.7 | 15.3 |
| | 4523 | 1.602 | 20.3 | 14.7 |
| | 4524 | 1.659 | 21.5 | 15.3 |
| | 4525 | 1.792 | 21.2 | 15.3 |

## Annex 1 GLP Compliance statements

Department of Health

# THE DEPARTMENT OF HEALTH OF THE GOVERNMENT OF THE UNITED KINGDOM

## GOOD LABORATORY PRACTICE

## STATEMENT OF COMPLIANCE
## IN ACCORDANCE WITH DIRECTIVE 2004/9/EC

**TEST FACILITY**

**Envigo CRS Limited - Eye**
**Occold**
**Eye**
**Suffolk**
**IP23 7PX**

**TEST TYPE(S)**

**Analytical/Clinical Chemistry**
**Environmental Fate**
**Environmental Toxicity**
**Ecosystems**
**Phys.Chem. Testing**
**Residue Studies**
**Toxicology**

**DATE OF INSPECTION** **01 to 03 December 2015**

An inspection for compliance with the Principles of Good Laboratory Practice was carried out at the above test facility as part of the UK Good Laboratory Practice Compliance Monitoring Programme.

This statement confirms that, on the date of issue, the UK Good Laboratory Practice Monitoring Authority were satisfied that the above test facility was operating in compliance with the OECD Principles of Good Laboratory Practice.

This statement constitutes a Good Laboratory Practice Instrument (as defined in the UK Good Laboratory Practice Regulations 1999).

[redacted]

15/2/16

**Dr. Andrew J. Gray**
**Head, UK GLP Monitoring Authority**

MHRA

Department of Health

# THE DEPARTMENT OF HEALTH OF THE GOVERNMENT OF THE UNITED KINGDOM

## GOOD LABORATORY PRACTICE

## STATEMENT OF COMPLIANCE IN ACCORDANCE WITH DIRECTIVE 2004/9/EC

**TEST FACILITY**

**Envigo CRS Limited - Huntingdon**
**Woolley Road**
**Alconbury**
**Cambs.**
**PE28 4HS**

**TEST TYPE(S)**

**Analytical/Clinical Chemistry**
**Environmental Fate**
**Environmental Toxicity**
**Ecosystems**
**Phys.Chem. Testing**
**Mutagenicity**
**Toxicology**

**DATE OF INSPECTION** **25 to 27 November 2015**

An inspection for compliance with the Principles of Good Laboratory Practice was carried out at the above test facility as part of the UK Good Laboratory Practice Compliance Monitoring Programme.

This statement confirms that, on the date of issue, the UK Good Laboratory Practice Monitoring Authority were satisfied that the above test facility was operating in compliance with the OECD Principles of Good Laboratory Practice.

This statement constitutes a Good Laboratory Practice Instrument (as defined in the UK Good Laboratory Practice Regulations 1999).

[redacted]

15/2/16

**Dr. Andrew J. Gray**
**Head, UK GLP Monitoring Authority**

MHRA

# Annex 11 Statistical analysis report

# STATISTICAL ANALYSIS REPORT

# Gasoline Isobutanol Vapor Condensate: A 13-Week Inhalation (Whole-Body) Toxicity Study in Rats with Neurotoxicity, Genotoxicity and Immunotoxicity Assessments and with a 4 Week Recovery

## Motor Activity

| | |
|---|---|
| **Envigo study number:** | 14-6485 |
| **Version ID:** | Final Report |
| **Issue date:** | 22 March 2016 |

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# Signature Page

## STATISTICAL ANALYSIS REPORT

## Gasoline Isobutanol Vapor Condensate: A 13-Week Inhalation (Whole-Body) Toxicity Study in Rats with Neurotoxicity, Genotoxicity and Immunotoxicity Assessments and with a 4 Week Recovery

## Motor Activity

[redacted]

22 March 2016

Gareth Thomas, BSc (Hons)
Contributing Scientist
Global Head of Statistics and Data Management
Statistics and Data Management Department
Envigo

Date

# 1. Introduction

The study comprised an air control and three treatment groups (Gasoline Isobutanol Vapor Condensate at 2000, 10000 and 20000 mg/m$^3$, referred to as Groups 1 to 4 respectively). Motor activity data were provided for pre-treatment and during Weeks 4, 8 and 13. Counts of motor activity were recorded over 12 5-minute intervals for 10 animals per sex per group.

# 2. Methodology

If there were more than six distinct responses recorded, across all groups, the data were considered to be continuous. Bartlett's test for variance homogeneity (Bartlett, 1937) was applied. If this test was not significant at the 1% level, then parametric analysis was applied. The F1 approximate test was applied to Groups 1 to 4. This test is designed to detect significant departure from monotonicity of means when the main test for the comparison of the means is a parametric monotonic trend test, such as Williams' test (Williams 1971, 1972). The test statistic compares the mean square, NMS, for the deviations of the observed means from the maximum likelihood means, calculated under a constraint of monotonicity with the usual error mean square, EMS. The null hypothesis is that the true means are monotonically ordered. The test statistic is F1 = NMS/EMS which can be compared with standard tables of the F distribution with 1 and error degrees of freedom. If the F1 test was not significant at the 1% level, Williams' test for a monotonic trend was applied to compare Groups 2, 3 and 4 to Group 1, otherwise Dunnett's test (Dunnett 1955, 1964) was performed instead.

If Bartlett's test was significant at the 1% level, then logarithmic and square-root transformations were tried. If Bartlett's test was still significant, then non-parametric tests were applied. The H1 approximate test, the non-parametric equivalent of the F1 test described above, was applied to Groups 1 to 4. This test is designed to be used when the main test for comparison of the means is a non-parametric monotonic trend test, such as Shirley's test. The test statistic compares the non-monotonicity sums of squares, NRSS, for the deviations of the observed mean ranks from the maximum likelihood mean ranks with the non-parametric equivalent of the error sums of squares, ERSS = N*(N*1)/12. The test statistic is H1 = NRSS/ERSS which can be compared to standard tables of the $\chi^2$-distribution with 1 degree of freedom. If the H1 test was not significant at the 1% level, Shirley's test for a monotonic trend (Shirley, 1977) was applied to compare Groups 2, 3 and 4 to Group 1, otherwise Steel's test (Steel, 1959) was performed instead.

For pre-treatment data, if Bartlett's test for variance homogeneity was not significant at the 1% level, then parametric methods were applied. Analysis of variance was used to test for any group differences. Where this was significant ($p$<0.05) inter group comparisons using $t$-tests, with the error mean square from the one-way analysis of variance, were made. If Bartlett's test was significant at the 1% level, then logarithmic and square-root transformations will be tried. If Bartlett's test was still significant, then non-parametric methods were applied to mean ranks. Kruskal-Wallis' test (Kruskal and Wallis 1952, 1953) was used to test for any group differences. Where this was significant ($p$<0.05) inter group comparisons using Wilcoxon rank sum tests (Wilcoxon, 1945) were made.

If there were between three and six distinct responses recorded, across all groups, the data were considered to be discrete. Test-article treated groups (Groups 2, 3 and 4) were compared back to the control (Group 1) using Jonckheere-Terpstra test (Jonckheere, 1954). If the Jonckheere-Terpstra test was significant at the 5% level, then the direction of the trend was established and one-tailed step-down testing in this direction was performed. If the Jonckheere-Terpstra test was not significant at the 5% level, then the Kruskal-Wallis test was applied to Groups 1 to 4. If the Kruskal-Wallis test was significant at the 5% level, the test-article treated groups (Groups 2, 3 and 4) were compared to the control (Group 1) using exact Wilcoxon rank sum tests, otherwise, no further comparisons were made. For pre-treatment data, a Kruskal-Wallis test was performed. If the test was significant at the 5% level treated groups were compared to control using exact Wilcoxon rank sum tests.

If there were two distinct responses recorded, across all groups, the data were considered to be binary. Test article-treated groups (Groups 2 to 4) were compared to the control (Group 1) using the Cochran-Armitage test (Armitage, 1955). If the Cochran-Armitage test was significant at the 5% level, then the direction of the trend was established and one-tailed step-down testing in this direction was performed. If the Cochran-Armitage test was not significant at the 5% level, then the $\chi^2$ test (Armitage *et al* 2002) was applied to Groups 1 to 4. If the $\chi^2$ test was significant at the 5% level, the test-article treated groups (Group 2 to 4) were compared to the saline control (Group 1) using Fisher's exact tests (Fisher, 1973), otherwise, no further comparisons were made. For pre-treatment data, an exact $\chi^2$ test was performed. If the $\chi^2$ test was significant at the 5% level, the test-article treated groups were compared to the control using Fisher's exact tests.

Statistical significance was declared at the 5% and 1% levels.

# 3. Data Handling

The data were received electronically and analysed using Quasar 1.4.1 (Quasar 1.4.1 2015).

# 4. Results

The results are presented in Table 1 to Table 8.

## 4.1 Males

**Horizontal**

**Pre-treatment**

There was a significant overall difference between the groups at time interval 7 ($p$=0.002, ANOVA). There were statistically significant differences between Groups 1 and 2 and between Groups 1 and 4 for interval 7 ($p$=0.037 and $p$<0.001 respectively, $t$-test).

**Week 4**

The 10000 and 20000 mg/m$^3$ treated groups had significantly increased motor activity compared to control during interval 4 ($p \leq 0.004$, Williams' test). The 20000 mg/m$^3$ treated group had significantly increased motor activity compared to control during intervals 6 and 7 ($p \leq 0.033$, Williams' test).

**Week 8**

The 20000 mg/m$^3$ treated group had significantly increased motor activity compared to control during interval 8 ($p=0.050$, Williams' test).

**Week 13**

There were no statistically significant differences between the control and treated groups.

**Vertical**

**Pre-treatment**

There were no statistically significant differences between the groups at pre-treatment.

**Week 4**

The 20000 mg/m$^3$ treated group had significantly increased motor activity compared to control during interval 3 ($p=0.043$, Williams' test), interval 6 ($p=0.012$, Shirley's test) and interval 7 ($p=0.016$, Williams' test).

**Week 8**

The 20000 mg/m$^3$ treated group had significantly increased motor activity compared to control during interval 8 ($p=0.014$, Shirley's test).

**Week 13**

There were no statistically significant differences between the control and treated groups.

## 4.2 Females

**Horizontal**

**Pre-treatment**

There were no statistically significant differences between the groups at pre-treatment.

**Week 4**

The 20000 mg/m$^3$ treated group had significantly decreased motor activity compared to control during interval 2 ($p=0.049$, Williams' test).

**Week 8**

There were no statistically significant differences between the control and treated groups.

**Week 13**

There were no statistically significant differences between the control and treated groups.

**Vertical**

**Pre-treatment**

There were no statistically significant differences between the groups at pre-treatment.

**Week 4**

The 2000, 10000 and 20000 mg/m$^3$ treated groups had significantly decreased motor activity compared to control during interval 5 ($p$=0.036, Williams' test).

**Week 8**

There were no statistically significant differences between the control and treated groups.

**Week 13**

There were no statistically significant differences between the control and treated groups.

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# 6. Key to Tables

The means presented in Table 1 to Table 8 are the observed means unless otherwise stated.

L Data were log transformed for the statistical analysis.
S Data were square root transformed for the statistical analysis.

Unless indicated otherwise (using symbols listed below), Groups 2, 3 and 4 were compared to Group 1 using Williams' test.

Av Comparison of all groups using Analysis of variance.
Ch Comparison of all groups using Chi-squared test.
KW Comparison of all groups using Kruskal-Wallis test.
Sh Groups 2, 3 and 4 compared to Group 1 using Shirley's test.
Tt Groups 2, 3 and 4 compared to Group 1 using *t*-tests.

## Table 1 Horizontal results – Pre-treatment

| Sex | Interval | Overall test | Control | 2000 mg/m$^3$ | 10000 mg/m$^3$ | 20000 mg/m$^3$ |
|---|---|---|---|---|---|---|
| | | *p*-value | Mean | Mean | Mean | Mean |
| Males | 1 | 0.278 Av | 701.5 | 655.2 | 738.3 | 666.0 |
| | 2 | 0.449 Av | 232.5 | 251.2 | 250.3 | 313.8 |
| | 3 | 0.702 Av | 203.3 | 148.3 | 210.5 | 203.2 |
| | 4 | 0.732 Av | 171.3 | 128.9 | 152.1 | 192.8 |
| | 5 | 0.066 Av | 164.0 | 120.3 | 54.8 | 119.9 |
| | 6 | 0.632 Av | 76.6 | 80.8 | 41.1 | 88.5 |
| | 7 | 0.002** Av | 17.6 | 40.7 | 23.1 | 57.7 |
| | 8 | 0.744 Av | 38.0 | 47.7 | 30.4 | 60.8 |
| | 9 S | 0.525 Av | 60.5 | 54.3 | 41.3 | 78.1 |
| | 10 | 0.762 Av | 48.2 | 48.8 | 37.8 | 64.7 |
| | 11 | 0.780 Av | 74.4 | 49.5 | 61.4 | 44.5 |
| | 12 S | 0.236 Av | 66.7 | 23.4 | 43.4 | 38.0 |
| Females | 1 | 0.682 Av | 676.5 | 670.8 | 680.2 | 623.5 |
| | 2 | 0.715 Av | 259.0 | 328.4 | 319.6 | 321.9 |
| | 3 | 0.075 Av | 159.3 | 89.1 | 205.9 | 201.6 |
| | 4 | 0.675 Av | 91.1 | 108.8 | 159.9 | 119.5 |
| | 5 | 0.564 Av | 76.9 | 100.7 | 82.3 | 49.5 |
| | 6 | 0.644 Av | 52.4 | 95.6 | 78.4 | 45.9 |
| | 7 S | 0.632 Av | 81.4 | 42.8 | 43.8 | 57.1 |
| | 8 | 0.649 Av | 99.3 | 81.9 | 58.8 | 42.8 |
| | 9 | 0.739 Av | 55.9 | 70.6 | 47.0 | 90.8 |
| | 10 S | 0.164 Av | 30.1 | 55.0 | 41.8 | 103.1 |
| | 11 S | 0.564 Av | 54.6 | 78.3 | 44.5 | 25.4 |
| | 12 S | 0.415 Av | 26.2 | 58.6 | 28.1 | 48.2 |

** $p<0.01$ for overall treatment test

### Pairwise comparisons (following significant overall test)

| Sex | Comparison (Group numbers) | Interval 7 *p*-value Tt |
|---|---|---|
| Males | 1 *vs* 2 | 0.037* |
| | 1 *vs* 3 | 0.610 |
| | 1 *vs* 4 | <0.001** |

* $p<0.05$, ** $p<0.01$

## Table 2 Horizontal results – Week 4 Post-treatment

| Sex | Interval | Overall test | Control | 2000 mg/m$^3$ | | 10000 mg/m$^3$ | | 20000 mg/m$^3$ | |
|---|---|---|---|---|---|---|---|---|---|
| | | *p*-value | Mean | Mean | *p*-value | Mean | *p*-value | Mean | *p*-value |
| Males | 1 | - | 692.3 | 640.1 | 0.694 | 683.8 | 0.694 | 650.0 | 0.568 |
| | 2 | - | 408.3 | 414.6 | 1.000 | 425.6 | 1.000 | 391.3 | 0.889 |
| | 3 | - | 273.2 | 281.5 | 0.882 | 311.5 | 0.593 | 388.3 | 0.055 |
| | 4 | - | 139.6 | 191.9 | 0.257 | 279.4 | 0.004** | 289.2 | 0.002** |
| | 5 | - | 116.0 | 100.9 | 1.000 | 151.1 | 0.494 | 201.0 | 0.063 |
| | 6 L | - | 59.5 | 37.3 | 1.000 | 117.3 | 0.261 | 195.0 | 0.004** |
| | 7 | - | 42.2 | 37.8 | 1.000 | 87.3 | 0.143 | 107.5 | 0.033* |
| | 8 S | - | 95.5 | 15.6 | 0.657 | 67.3 | 0.657 | 87.4 | 0.657 |
| | 9 S | - | 73.3 | 11.1 | 0.076 | 30.3 | 0.076 | 25.0 | 0.076 |
| | 10 | - | 37.5 | 22.0 | 0.313 | 21.1 | 0.313 | 9.4 | 0.071 |
| | 11 S | - | 13.9 | 46.1 | 0.307 | 24.0 | 0.307 | 30.5 | 0.227 |
| | 12 S | - | 12.8 | 34.4 | 0.534 | 34.3 | 0.534 | 43.2 | 0.412 |
| Females | 1 | - | 778.2 | 803.5 | 1.000 | 792.0 | 1.000 | 707.9 | 0.320 |
| | 2 | - | 537.4 | 474.2 | 0.457 | 495.0 | 0.457 | 411.0 | 0.049* |
| | 3 | - | 333.2 | 271.4 | 0.788 | 329.8 | 0.788 | 228.6 | 0.209 |
| | 4 | - | 223.0 | 231.1 | 0.915 | 310.1 | 0.440 | 279.6 | 0.440 |
| | 5 | - | 211.3 | 94.8 | 0.107 | 132.5 | 0.107 | 124.6 | 0.107 |
| | 6 | - | 92.4 | 75.8 | 1.000 | 85.5 | 1.000 | 96.9 | 1.000 |
| | 7 | - | 116.4 | 89.8 | 0.903 | 97.0 | 0.903 | 74.0 | 0.737 |
| | 8 S | - | 92.7 | 36.5 | 0.743 | 55.5 | 0.743 | 47.8 | 0.743 |
| | 9 | - | 45.8 | 49.7 | 0.945 | 72.3 | 0.932 | 57.3 | 0.932 |
| | 10 | - | 70.5 | 40.0 | 0.780 | 44.3 | 0.780 | 60.4 | 0.780 |
| | 11 S | - | 47.3 | 73.4 | 1.000 | 54.1 | 0.808 | 17.0 | 0.333 |
| | 12 | - | 17.7 | 55.5 | 1.000 Sh | 74.0 | 1.000 Sh | 15.9 | 0.574 Sh |

- not applicable
* $p<0.05$, ** $p<0.01$

## Table 3 Horizontal results – Week 8 Post-treatment

| Sex | Interval | Overall test | Control | 2000 mg/m$^3$ | | 10000 mg/m$^3$ | | 20000 mg/m$^3$ | |
|---|---|---|---|---|---|---|---|---|---|
| | | *p*-value | Mean | Mean | *p*-value | Mean | *p*-value | Mean | *p*-value |
| Males | 1 | - | 619.5 | 666.8 | 0.813 | 641.8 | 0.813 | 627.6 | 0.813 |
| | 2 | - | 366.4 | 367.3 | 1.000 Sh | 359.3 | 1.000 Sh | 348.2 | 0.873 Sh |
| | 3 | - | 207.2 | 195.7 | 0.989 | 199.3 | 0.989 | 152.8 | 0.326 |
| | 4 | - | 123.3 | 205.9 | 0.514 | 116.7 | 0.514 | 177.3 | 0.336 |
| | 5 | - | 35.5 | 89.6 | 0.198 | 63.0 | 0.198 | 76.8 | 0.198 |
| | 6 | - | 49.0 | 37.5 | 0.598 | 30.3 | 0.502 | 30.3 | 0.502 |
| | 7 | - | 50.3 | 23.9 | 1.000 | 53.2 | 1.000 | 58.2 | 1.000 |
| | 8 S | - | 16.6 | 33.3 | 0.866 | 20.4 | 0.866 | 89.4 | 0.050* |
| | 9 S | - | 11.7 | 43.1 | 0.169 | 50.8 | 0.095 | 33.1 | 0.095 |
| | 10 | - | 9.7 | 38.8 | 1.000 Sh | 41.5 | 0.758 Sh | 35.4 | 0.469 Sh |
| | 11 | - | 12.9 | 53.5 | 1.000 Sh | 5.3 | 0.662 Sh | 13.8 | 0.662 Sh |
| | 12 S | - | 14.5 | 26.5 | 0.455 | 10.9 | 0.455 | 44.4 | 0.113 |
| Females | 1 | - | 717.0 | 752.8 | 1.000 | 754.3 | 1.000 | 635.2 | 0.095 |
| | 2 | - | 449.0 | 437.4 | 0.839 | 416.5 | 0.680 | 354.4 | 0.128 |
| | 3 | - | 219.5 | 209.3 | 1.000 | 197.5 | 1.000 | 236.9 | 0.956 |
| | 4 | - | 135.5 | 177.8 | 1.000 | 118.2 | 0.957 | 115.8 | 0.957 |
| | 5 | - | 140.0 | 83.2 | 0.256 | 51.9 | 0.205 | 88.2 | 0.205 |
| | 6 | - | 52.1 | 36.0 | 1.000 | 112.6 | 0.412 | 64.0 | 0.412 |
| | 7 S | - | 31.2 | 39.8 | 0.763 | 80.6 | 0.306 | 65.5 | 0.306 |
| | 8 S | - | 12.5 | 18.8 | 0.710 | 30.2 | 0.267 | 37.9 | 0.128 |
| | 9 S | - | 51.1 | 22.4 | 0.857 | 41.9 | 0.857 | 61.9 | 0.857 |
| | 10 | - | 65.0 | 9.3 | 0.529 Sh | 17.1 | 0.529 Sh | 80.8 | 0.529 Sh |
| | 11 S | - | 11.3 | 46.6 | 0.402 | 37.9 | 0.402 | 36.4 | 0.402 |
| | 12 S | - | 59.2 | 74.3 | 1.000 | 39.1 | 0.864 | 12.7 | 0.286 |

- not applicable
* $p<0.05$

## Table 4 Horizontal results – Week 13 Post-treatment

| Sex | Interval | Overall test | Control | 2000 mg/m$^3$ | | 10000 mg/m$^3$ | | 20000 mg/m$^3$ | |
|---|---|---|---|---|---|---|---|---|---|
| | | *p*-value | Mean | Mean | *p*-value | Mean | *p*-value | Mean | *p*-value |
| Males | 1 | - | 599.3 | 579.8 | 1.000 | 644.8 | 1.000 | 581.1 | 0.877 |
| | 2 | - | 345.6 | 284.3 | 1.000 | 385.8 | 1.000 | 306.7 | 0.633 |
| | 3 S | - | 206.5 | 117.6 | 0.598 | 159.9 | 0.598 | 166.4 | 0.598 |
| | 4 S | - | 42.8 | 63.1 | 0.458 | 111.8 | 0.371 | 72.4 | 0.371 |
| | 5 | - | 24.4 | 51.4 | 0.651 | 29.9 | 0.651 | 26.9 | 0.651 |
| | 6 | - | 22.9 | 18.2 | 1.000 | 34.7 | 0.599 | 32.3 | 0.599 |
| | 7 | - | 17.4 | 46.3 | 0.581 | 25.7 | 0.581 | 22.7 | 0.581 |
| | 8 S | - | 19.2 | 25.5 | 1.000 | 15.1 | 1.000 | 25.7 | 1.000 |
| | 9 | - | 17.4 | 11.4 | 1.000 Sh | 5.2 | 1.000 Sh | 53.8 | 0.295 Sh |
| | 10 S | - | 10.1 | 9.2 | 1.000 | 28.4 | 0.814 | 12.8 | 0.814 |
| | 11 | - | 24.0 | 28.9 | 1.000 | 36.3 | 1.000 | 18.1 | 0.988 |
| | 12 S | - | 24.2 | 60.0 | 0.841 | 11.8 | 0.841 | 71.9 | 0.244 |
| Females | 1 | - | 637.9 | 719.3 | 1.000 | 673.7 | 1.000 | 598.3 | 0.587 |
| | 2 | - | 296.6 | 326.5 | 1.000 | 317.2 | 1.000 | 258.6 | 0.626 |
| | 3 | - | 136.4 | 229.5 | 0.612 | 173.2 | 0.612 | 123.9 | 0.612 |
| | 4 L | - | 51.1 | 102.1 | 1.000 | 78.6 | 0.942 | 46.7 | 0.765 |
| | 5 S | - | 9.7 | 47.0 | 0.173 | 34.6 | 0.173 | 35.3 | 0.170 |
| | 6 | - | 12.9 | 46.9 | 0.567 Sh | 71.0 | 0.176 Sh | 20.3 | 0.176 Sh |
| | 7 S | - | 15.0 | 33.3 | 1.000 | 56.0 | 0.352 | 23.6 | 0.352 |
| | 8 | - | 5.9 | 18.2 | 0.250 Sh | 77.6 | 0.083 Sh | 39.3 | 0.083 Sh |
| | 9 S | - | 12.8 | 41.2 | 0.398 | 42.2 | 0.306 | 26.5 | 0.306 |
| | 10 | - | 8.7 | 41.6 | 0.144 Sh | 76.2 | 0.144 Sh | 19.2 | 0.133 Sh |
| | 11 | - | 11.5 | 50.1 | 1.000 Sh | 60.3 | 1.000 Sh | 8.8 | 0.597 Sh |
| | 12 S | - | 68.3 | 41.5 | 0.813 | 29.2 | 0.352 | 22.0 | 0.352 |

- not applicable

## Table 5 Vertical results – Pre-treatment

| Sex | Interval | Overall test *p*-value | Control Mean | 2000 mg/m$^3$ Mean | 10000 mg/m$^3$ Mean | 20000 mg/m$^3$ Mean |
|---|---|---|---|---|---|---|
| Males | 1 | 0.532 Av | 39.9 | 35.6 | 45.3 | 42.1 |
| | 2 | 0.218 Av | 9.8 | 11.0 | 7.9 | 16.9 |
| | 3 | 0.707 Av | 9.9 | 5.1 | 8.1 | 8.3 |
| | 4 | 0.857 Av | 7.1 | 4.5 | 6.2 | 8.2 |
| | 5 S | 0.326 Av | 3.5 | 2.9 | 0.5 | 1.5 |
| | 6 S | 0.928 Av | 1.3 | 2.1 | 0.5 | 2.0 |
| | 7 †† | 1.000 Ch | 0.0 | 0.0 | 0.0 | 0.4 |
| | 8 † | 0.229 KW | 0.0 | 1.2 | 0.0 | 1.3 |
| | 9 † | 0.497 KW | 0.6 | 1.1 | 0.0 | 0.2 |
| | 10 † | 0.561 KW | 0.0 | 1.7 | 0.0 | 0.5 |
| | 11 † | 0.787 KW | 1.2 | 0.5 | 0.2 | 0.0 |
| | 12 † | 0.104 KW | 1.2 | 0.0 | 0.0 | 0.0 |
| Females | 1 | 0.881 Av | 32.1 | 37.5 | 33.6 | 33.2 |
| | 2 | 0.605 Av | 13.9 | 20.8 | 13.0 | 17.2 |
| | 3 S | 0.235 Av | 6.8 | 2.0 | 7.5 | 7.8 |
| | 4 | 0.797 Av | 3.3 | 8.2 | 6.5 | 6.8 |
| | 5 | 0.138 KW | 3.2 | 4.0 | 0.5 | 0.4 |
| | 6 S | 0.484 Av | 1.1 | 5.0 | 1.5 | 2.5 |
| | 7 | 0.515 KW | 3.2 | 0.1 | 0.1 | 3.6 |
| | 8 | 0.382 KW | 4.9 | 5.4 | 1.3 | 0.1 |
| | 9 † | 0.828 KW | 1.2 | 3.4 | 0.2 | 1.8 |
| | 10 † | 0.205 KW | 0.0 | 0.5 | 0.1 | 2.3 |
| | 11 † | 0.787 KW | 1.1 | 1.1 | 0.1 | 0.0 |
| | 12 † | 0.561 KW | 0.0 | 2.4 | 0.0 | 0.3 |

† Between three and six distinct responses across all groups
†† Two distinct responses across all groups
- not applicable

## Table 6 Vertical results – Week 4 Post-treatment

| Sex | Interval | Overall test | Control | 2000 mg/m$^3$ | | 10000 mg/m$^3$ | | 20000 mg/m$^3$ | |
|---|---|---|---|---|---|---|---|---|---|
| | | *p*-value | Mean | Mean | *p*-value | Mean | *p*-value | Mean | *p*-value |
| Males | 1 | - | 47.5 | 41.7 | 0.240 Sh | 39.8 | 0.214 Sh | 39.3 | 0.214 Sh |
| | 2 | - | 22.8 | 24.2 | 1.000 | 20.9 | 0.758 | 19.0 | 0.442 |
| | 3 | - | 11.5 | 11.5 | 1.000 | 10.1 | 1.000 | 19.2 | 0.043* |
| | 4 | - | 5.4 | 6.7 | 0.697 | 11.3 | 0.097 | 11.6 | 0.084 |
| | 5 | - | 3.9 | 2.2 | 1.000 | 3.6 | 1.000 | 6.3 | 0.408 |
| | 6 | - | 0.6 | 0.2 | 1.000 Sh | 3.3 | 0.250 Sh | 8.7 | 0.012* Sh |
| | 7 S | - | 0.4 | 0.5 | 0.771 | 1.5 | 0.219 | 2.5 | 0.016* |
| | 8 | - | 2.9 | 0.0 | 0.523 | 1.5 | 0.523 | 2.4 | 0.523 |
| | 9 † | 0.528 KW | 0.8 | 0.0 | - | 0.1 | - | 0.4 | - |
| | 10 †† | 1.000 Ch | 0.5 | 0.0 | - | 0.0 | - | 0.0 | - |
| | 11 † | 0.538 KW | 0.0 | 1.0 | - | 0.1 | - | 0.9 | - |
| | 12 † | 0.603 KW | 0.2 | 0.4 | - | 0.5 | - | 1.0 | - |
| Females | 1 | - | 43.5 | 49.0 | 1.000 | 44.5 | 1.000 | 38.2 | 0.486 |
| | 2 | - | 24.0 | 29.8 | 1.000 | 26.7 | 1.000 | 21.1 | 0.621 |
| | 3 | - | 13.1 | 11.0 | 0.849 | 12.1 | 0.849 | 10.5 | 0.691 |
| | 4 | - | 9.5 | 9.9 | 0.936 | 13.8 | 0.465 | 15.0 | 0.346 |
| | 5 | - | 7.5 | 1.8 | 0.036* | 3.2 | 0.036* | 2.7 | 0.036* |
| | 6 | - | 1.6 | 2.8 | 0.794 | 2.8 | 0.794 | 3.8 | 0.553 |
| | 7 S | - | 3.3 | 3.6 | 1.000 | 6.4 | 1.000 | 2.3 | 1.000 |
| | 8 † | 0.949 KW | 1.5 | 0.2 | - | 3.2 | - | 0.4 | - |
| | 9 † | 0.888 KW | 0.4 | 0.9 | - | 3.0 | - | 2.5 | - |
| | 10 † | 0.934 KW | 0.9 | 2.4 | - | 1.4 | - | 1.5 | - |
| | 11 | - | 1.5 | 3.3 | 1.000 Sh | 1.5 | 0.794 Sh | 0.2 | 0.675 Sh |
| | 12 † | 0.293 KW | 0.0 | 0.7 | - | 2.3 | - | 0.0 | - |

† Between three and six distinct responses across all groups
†† Two distinct responses across all groups
- not applicable
* $p<0.05$

## Table 7 Vertical results – Week 8 Post-treatment

| Sex | Interval | Overall test | Control | 2000 mg/m$^3$ | | 10000 mg/m$^3$ | | 20000 mg/m$^3$ | |
|---|---|---|---|---|---|---|---|---|---|
| | | *p*-value | Mean | Mean | *p*-value | Mean | *p*-value | Mean | *p*-value |
| Males | 1 | - | 30.8 | 37.9 | 0.758 | 31.7 | 0.758 | 29.8 | 0.758 |
| | 2 | - | 17.0 | 18.1 | 1.000 | 12.0 | 0.198 | 13.1 | 0.198 |
| | 3 | - | 6.4 | 7.5 | 1.000 | 5.9 | 1.000 | 3.7 | 0.400 |
| | 4 | - | 2.2 | 7.1 | 0.404 | 1.7 | 0.404 | 6.1 | 0.115 |
| | 5 † | 0.076 KW | 0.1 | 1.2 | - | 0.6 | - | 1.6 | - |
| | 6 † | 1.000 KW | 0.8 | 0.3 | - | 0.1 | - | 0.1 | - |
| | 7 † | 0.453 KW | 0.8 | 0.1 | - | 1.8 | - | 0.8 | - |
| | 8 | - | 0.0 | 1.0 | 0.452 Sh | 0.1 | 0.452 Sh | 3.0 | 0.014* Sh |
| | 9 † | 0.787 KW | 0.0 | 0.8 | - | 0.8 | - | 0.1 | - |
| | 10 † | 1.000 KW | 0.1 | 1.0 | - | 0.9 | - | 0.1 | - |
| | 11 † | 0.787 KW | 0.1 | 1.5 | - | 0.0 | - | 0.1 | - |
| | 12 † | 0.540 KW | 0.6 | 0.2 | - | 0.0 | - | 1.2 | - |
| Females | 1 | - | 35.5 | 37.9 | 1.000 | 38.4 | 1.000 | 32.7 | 0.684 |
| | 2 | - | 22.0 | 20.1 | 0.648 | 17.5 | 0.338 | 14.2 | 0.082 |
| | 3 | - | 8.0 | 9.1 | 1.000 | 4.8 | 0.905 | 8.6 | 0.905 |
| | 4 | - | 3.7 | 7.0 | 0.931 | 3.8 | 0.931 | 3.3 | 0.931 |
| | 5 | - | 4.4 | 1.9 | 0.331 | 1.4 | 0.331 | 2.8 | 0.331 |
| | 6 S | - | 1.9 | 1.1 | 1.000 | 4.9 | 0.739 | 1.9 | 0.739 |
| | 7 S | - | 0.7 | 1.1 | 0.889 | 1.1 | 0.869 | 2.3 | 0.869 |
| | 8 † | 0.561 KW | 0.0 | 0.0 | - | 0.3 | - | 0.6 | - |
| | 9 | - | 2.2 | 0.0 | 0.870 | 1.1 | 0.870 | 2.7 | 0.870 |
| | 10 † | 0.306 KW | 1.1 | 0.0 | - | 0.3 | - | 1.0 | - |
| | 11 † | 0.787 KW | 0.0 | 0.9 | - | 1.0 | - | 0.4 | - |
| | 12 | - | 1.8 | 1.8 | 1.000 | 1.2 | 0.824 | 0.0 | 0.306 |

† Between three and six distinct responses across all groups
- not applicable
* $p<0.05$

## Table 8 Vertical results – Week 13 Post-treatment

| Sex | Interval | Overall test | Control | 2000 mg/m$^3$ | | 10000 mg/m$^3$ | | 20000 mg/m$^3$ | |
|---|---|---|---|---|---|---|---|---|---|
| | | *p*-value | Mean | Mean | *p*-value | Mean | *p*-value | Mean | *p*-value |
| Males | 1 | - | 30.4 | 28.6 | 1.000 | 31.7 | 1.000 | 26.6 | 0.497 |
| | 2 | - | 16.4 | 10.1 | 0.887 | 20.2 | 0.887 | 11.0 | 0.214 |
| | 3 | - | 7.6 | 2.5 | 0.096 | 4.1 | 0.096 | 4.0 | 0.096 |
| | 4 S | - | 0.6 | 0.9 | 1.000 | 3.5 | 0.468 | 1.6 | 0.468 |
| | 5 † | 0.443 KW | 0.6 | 1.6 | - | 0.2 | - | 0.2 | - |
| | 6 ††† | - | 0.0 | 0.0 | - | 0.0 | - | 0.0 | - |
| | 7 † | 0.550 KW | 0.2 | 0.5 | - | 0.4 | - | 0.0 | - |
| | 8 † | 0.561 KW | 0.0 | 0.2 | - | 0.0 | - | 0.5 | - |
| | 9 † | 0.104 KW | 0.0 | 0.0 | - | 0.0 | - | 1.3 | - |
| | 10 †† | 1.000 Ch | 0.0 | 0.0 | - | 0.6 | - | 0.0 | - |
| | 11 † | 0.293 KW | 0.0 | 0.4 | - | 0.4 | - | 0.0 | - |
| | 12 † | 0.117 KW | 0.0 | 1.6 | - | 0.0 | - | 1.9 | - |
| Females | 1 | - | 27.7 | 33.4 | 0.339 | 33.3 | 0.339 | 28.1 | 0.339 |
| | 2 | - | 7.5 | 9.4 | 0.585 | 13.6 | 0.413 | 8.3 | 0.413 |
| | 3 | - | 3.7 | 8.4 | 0.469 | 6.4 | 0.469 | 5.9 | 0.469 |
| | 4 S | - | 0.5 | 2.8 | 0.678 | 2.6 | 0.678 | 0.6 | 0.678 |
| | 5 † | 0.581 KW | 0.0 | 0.8 | - | 0.3 | - | 0.4 | - |
| | 6 † | 0.823 KW | 0.1 | 1.0 | - | 2.8 | - | 0.2 | - |
| | 7 † | 0.631 KW | 0.2 | 1.1 | - | 1.3 | - | 0.6 | - |
| | 8 | - | 0.0 | 0.1 | 0.317 Sh | 3.5 | 0.142 Sh | 0.8 | 0.142 Sh |
| | 9 † | 0.538 KW | 0.0 | 0.8 | - | 0.5 | - | 0.1 | - |
| | 10 † | 0.086 KW | 0.0 | 0.5 | - | 4.3 | - | 0.0 | - |
| | 11 † | 0.261 KW | 0.0 | 0.2 | - | 2.7 | - | 0.0 | - |
| | 12 S | - | 1.8 | 0.7 | 0.970 | 2.1 | 0.970 | 0.5 | 0.786 |

† Between three and six distinct responses across all groups
†† Two distinct responses across all groups
††† One distinct response across all groups, no animals had vertical motor activity, no analysis performed
- not applicable

# Appendix E
# Toxicology Report for Gasoline Isobutanol Vapor Condensate: Inhalation (Whole-body) Embryo-fetal Toxicity Study in Rats

STUDY NO. 14-4418

# GASOLINE ISOBUTANOL VAPOR CONDENSATE:

# INHALATION (WHOLE-BODY) EMBRYO-FETAL TOXICITY STUDY IN RATS

**Final Report**


Author: Gary M. Hoffman, BA, DABT

Performed by: Envigo
Mettlers Road
East Millstone, New Jersey 08875-2360


Submitted to: Butamax Advanced Biofuels, LLC
200 Powder Mill Road
E356 Third Floor
Wilmington, Delaware 19880-0356

Attn: James Baustian

Date: 21 March 2016



On 21 September 2015 the legal entity Huntingdon Life Sciences, Inc was renamed as Envigo CRS, Inc. No other changes to the legal entity have occurred.

## STATEMENT OF COMPLIANCE

This study was conducted in compliance with the following Good Laboratory Practices:

- Organization for Economic Cooperation and Development (OECD) Principles of Good Laboratory Practices ENV/MC/CHEM/(98)17
- US EPA 79.60, CFR Vol. 59, No. 122, 27 June 1994.

With the exception of the following that were not considered to have impacted the validity or integrity of the study:

The expiry date for the test substance is not available.

Test substance analysis by Chevron Energy & Technology Company was done non-GLP.

Study Director: [redacted]

Gary M. Hoffman, BA, DABT
Study Director

January 2016
Date

## SIGNATURE PAGE

### SCIENTIST

The following Scientist was responsible for the overall conduct of this study:

[redacted]

Gary M. Hoffman, BA, DABT
Study Director

January 2016
Date

### SCIENTIFIC REVIEW

The following Scientist has reviewed and approved this report:

[redacted]

Robert M. Parker, PhD, DABT
Director, Developmental and Reproductive Toxicology

21 Jan 16
Date

## QUALITY ASSURANCE STATEMENT

Listed below are the dates that this study was inspected by the Quality Assurance Unit of Envigo, East Millstone, New Jersey, and the dates that findings were reported to the Study Director and Management. This report reflects the raw data as far as can be reasonably established.

| Type of Inspection | Date(s) of Inspection | Reported to Study Director and Management |
|---|---|---|
| GLP Protocol Review | 13, 18 May 2015 | 18 May 2015 |
| Exposure Monitoring and Pharmacy Data Review | 01 Jun 2015 | 01 Jun 2015 |
| Gestation Cesarean Sacrifice (GD 20) and Equipment Records | 16 Jun 2015 | 16 Jun 2015 |
| Visceral Evaluations and Training Records | 10 Jul 2015 | 10 Jul 2015 |
| Analytical Formulation Report and Data | 16, 20 Oct 2015 | 27 Oct 2015 |
| Aerosol Technology Report and Data | 12-13, 15 Oct, 11 Nov 2015 | 11 Nov 2015 |
| Draft Final Report Text, Tables, Appendices and Data, Summary, Results and Discussion and Conclusion | 22-23, 26-29 Oct, 05-06, 11 Nov 2015 | 12 Nov 2015 |
| Protocol Amendment 1 | 13 Jan 2016 | 13 Jan 2016 |
| Protocol Amendment 2 | 24 Feb 2016 | 24 Feb 2016 |
| Final Report Review | 10, 14 Mar 2016 | 14 Mar 2016 |

[redacted] 21MAR16

Jennifer Callahan B.S. AALAS RLAT Date
Quality Assurance Auditor

## LIST OF ABBREVIATIONS

| Abbreviation | Term |
|---|---|
| AAALAC | Association for Assessment and Accreditation of Laboratory Animal Care International |
| COA | Certificate of Analysis |
| EMS | error mean square |
| EPA | Environmental Protection Agency |
| GC | Gas chromatography |
| GD | Gestation Day |
| GES | gestation phase |
| GLP | Good Laboratory Practices |
| HLS | Huntingdon Life Sciences |
| hr(s) | hour(s) |
| LEL | lower explosive limit |
| min(s) | minute(s) |
| M | Male(s) |
| F | Female(s) |
| ~ | approximately |
| $mg/m^3$ | milligrams of test substance per cubic meter |
| NBF | neutral buffered formalin |
| MSDS | material safety data sheet |
| OECD | Organization for Economic Cooperation and Development |
| NOEL | No observable effect level |
| IR | infrared |
| US EPA | United States Environmental Protection Agency |

## SUMMARY

**Gasoline Isobutanol Vapor Condensate: Inhalation (Whole-Body) Embryo-Fetal Toxicity Study in Rats**

Time-mated female Sprague-Dawley CD® rats (24/group) were administered 0 (Air), 2,000, 10,000, or 20,000 mg/m$^3$ Gasoline Isobutanol Vapor Condensate via whole body inhalation once daily for 6 hours continuously and for 15 consecutive days from Gestation Days (GD) 5 to 19, inclusive (the period of major organogenesis, from implantation to the approximate day of closure of the hard palate). All animals were euthanized and Cesarean sections performed on GD 20. Parameters evaluated during the study were: viability, clinical observations, body weights and food consumption. A macroscopic postmortem evaluation was performed on all animals on GD 20, during which counts of corpora lutea and implantations and uterine weights were recorded; fetuses were removed, weighed (live fetuses only), sexed and examined externally for defects, for soft tissue abnormalities and for skeletal abnormalities and ossification state. Placentas were examined and weighed.

Gas chromatography (GC) analysis of the major components in the neat test substance and the test atmospheres showed a reasonably close comparison between the neat test substance and the vaporized test substance. This data demonstrated that the test animals were exposed, as expected, to all of the major components of the test substance in their reasonably proper proportion. The data were consistent from week-to-week during the study indicating stability of the test substance and the atmosphere generation techniques.

Overall target, nominal and achieved (per IR analysis) mean exposure concentrations are summarized below:

| Group | Test Substance | Atmosphere Concentration (mg/m$^3$) | | |
|---|---|---|---|---|
| | | Target | Nominal | Achieved |
| 1 | Air Control | 0 | 0 | 0 |
| 2 | Gasoline Isobutanol Vapor Condensate | 2,000 | 2,455 | 2,043 |
| 3 | Gasoline Isobutanol Vapor Condensate | 10,000 | 11,270 | 10,410 |
| 4 | Gasoline Isobutanol Vapor Condensate | 20,000 | 20,280 | 20,720 |

## SUMMARY

By IR analysis, no Gasoline Isobutanol Vapor Condensate was detected in Group 1 samples. Mean atmosphere concentrations were 2.2%, 4.1% and 3.6% above target for Groups 2, 3 and 4, respectively.

The differences between the nominal and measured concentrations for Groups 2 and 3 may be attributed to the limited sensitivity of the balance used to weigh test substance storage cylinders and the small volume of test substance dispensed during each exposure.

Particle size analysis confirmed the absence of condensation aerosol in all groups during pretest evaluations and throughout the study.

All animals survived until the completion of exposures.

Whole-body inhalation exposure of Gasoline Isobutanol Vapor Condensate at 2,000, 10,000 and 20,000 $mg/m^3$ was not associated with any effects on time-mated female rats and their fetuses.

Under the conditions of this study, the NOEL (no observable effect level) for Gasoline Isobutanol Vapor Condensate was considered to be 20,000 $mg/m^3$ for maternal and developmental effects.

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# 1. INTRODUCTION

This study was designed to assess any gross maternal and/or embryo-fetal toxicity of Gasoline Isobutanol Vapor Condensate in the rat, when administered daily via inhalation (whole-body) during the period of major organogenesis, from implantation to the approximate day of closure of the hard palate, GD 5 to 19, with Cesarean sections on GD 20.

# 2. MATERIALS AND METHODS

## 2.1. STUDY MANAGEMENT

### 2.1.1. SPONSOR

Butamax Advanced Biofuels, LLC
200 Powder Mill Road
E356 Third Floor
Wilmington, Delaware 19880-0356

### 2.1.2. SPONSOR REPRESENTATIVE

James Baustian

### 2.1.3. TESTING FACILITY

Envigo
P.O. Box 2360
Mettlers Road
East Millstone, New Jersey 08875-2360

### 2.1.4. STUDY DIRECTOR

Gary M. Hoffman, BA, DABT

## 2.2. STUDY DATES

### 2.2.1. STUDY INITIATION

21 May 2015 (Date Study Director signed the Protocol)

### 2.2.2. MATING - GESTATION DAY 0

27, 28, 29 and 30 May 2015

#### 2.2.3. DATE OF ANIMAL RECEIPT (OECD EXPERIMENTAL START DATE)

29 May 2015 and 1 June 2015

#### 2.2.4. GESTATION DAY 4 (GD 4)

31 May 2015 and 1, 2 and 3 June 2015

#### 2.2.5. DOSING INITIATION GD 5 (EPA EXPERIMENTAL START DATE)

1, 2, 3 and 4 June 2015

#### 2.2.6. DOSING TERMINATION (GD 19)

15, 16, 17 and 18 June 2015

#### 2.2.7. TERMINAL SACRIFICE (CESAREAN-SECTION, GD 20)

16. 17, 18 and 19 June 2015

#### 2.2.8. EXPERIMENTAL COMPLETION DATE

23 September 2015 (Date of last data collection)

#### 2.2.9. STUDY COMPLETION

21 March 2016 (Date Study Director signed the Final Report)

### 2.3. EXPERIMENTAL OUTLINE

Four (4) experimental groups (one control and 3 treated groups) consisting of twenty-four (24) time-mated females per group were exposed via inhalation (whole-body) administration daily for 6 hours continuously from GD 5 to 19. Terminal Cesarean sections occurred on GD 20 with evaluation of pregnancies for pre- and post-implantation loss, enumerating corpora lutea, live and dead/resorbed implantations. Live fetuses were examined externally, weighed and preserved. Placentas were examined and weighed. Approximately half of the fetuses from each litter were examined subsequently for soft-tissue abnormalities, the remaining half for skeletal abnormalities.

| Group | | Exposure Level ($mg/m^3$) | Number of Females |
|---|---|---|---|
| 1 | Control | 0 | 24 |
| 2 | Low | 2,000 | 24 |
| 3 | Mid | 10,000 | 24 |
| 4 | High | 20,000 | 24 |

Group 1 was operated under the same conditions as Group 4 but only with exposure to room air.

## 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 Gasoline Isobutanol Vapor Condensate. The duration of the study and frequency of exposures were considered to be the minimum necessary for making occupational and environmental health risk assessments and as per OECD and US EPA guidelines. This study was intended to support uses of the test substance that could lead to exposure of humans, by evaluating embryo-fetal toxicity. The OECD and US EPA guidelines for the design of embryo-fetal toxicity studies recommends that the period of treatment should be from the time of implantation to the time of closure of the hard palate. This will permit detection of effects on major organogenesis.

### 2.4.2. EXPOSURE LEVEL SELECTION

The exposure levels were based on the lower explosive limit (LEL) of the test substance such that the low and high exposure levels were ~5 and ~50% of the LEL. The high exposure level was considered to be the highest safe exposure level for laboratory use. Multiple gasoline products (including neat gasoline, gasoline with other oxygenates and this test substance) have been safely tested at this laboratory at these same exposure levels for up to 20 weeks of daily exposures without any clinical signs.

Neat isobutanol was tested previously with clinical signs of hypoactivity, diminished startle reflex and decreased motor activity in the range of exposure levels of 7,580 to 18,120 $mg/m^3$ (OECD,

2004). The test substance evaluated in this study contained ~2-3% isobutanol, thus the high exposure level of ~20,000 mg/m$^3$ of test substance provided an exposure of only ~400-600 mg/m$^3$ of isobutanol. Similar clinical signs are not expected in this study that will test gasoline blended with isobutanol.

A two week inhalation range-finding toxicity study (HLS 14-6484) with this test substance was recently completed at exposure levels of 2,000 and 20,000 mg/m$^3$ without any clinical signs. A thirteen week inhalation toxicity study (HLS 14-6485) and a 1-generation inhalation toxicity study (HLS 14-4417) with this test substance were also recently completed at exposure levels of 2,000, 10,000 and 20,000 mg/m$^3$ without any clinical signs.

### 2.4.3. TEST ANIMAL SELECTION

Non-clinical studies in a rodent species are required by the OECD and US EPA to evaluate potential occupational and environmental exposure to humans. The rat is accepted by Regulatory Authorities (e.g., OECD and US EPA) as a surrogate for humans in the detection of effects on embryo-fetal development. It is the preferred rodent species for most aspects of reproductive toxicity testing, for practical reasons and in view of the large amount of accumulated background information in the species.

### 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 US EPA test guidelines. As per OECD test guideline, "Each test and control group should contain a sufficient number of females to result in approximately 20 female animals with implantation sites at necropsy." Since some of the endpoints of principal interest (e.g. embryo-fetal death, fetal malformations) are low-frequency events and in the expectation of pregnancy rates of 80-100%, the group size of 24 mated female rats was considered appropriate for this study to provide a sufficient number of litters for evaluation in each group.

In the range-finding study for this test substance, there was a pregnancy success rate of 80%. Although a pregnancy rate of 90%

or greater is more typical and likely, the historical range is 80-100%. If fewer than 24 rats per group were used, and a pregnancy success rate of <90% occurred in any of the groups, the study would fall short of the benchmark of "20 litters" per group, which is generally recognized as the minimum number of litters needed to produce a sufficient number of pups. Since previous developmental toxicity studies conducted under the API 211(b) test program used 24 pregnant rats per group, that number has become the standard of expectation set with EPA.

Three test substance-treated groups receiving low, medium and high exposure levels and a negative air control group were considered the minimum number of groups necessary to provide a range of effects and allow for extrapolation of results to humans.

## 2.5. TEST SUBSTANCE

Gasoline Isobutanol Vapor Condensate

### 2.5.1. TEST SUBSTANCE CATEGORY

Gasoline product

### 2.5.2. SUPPLIER

Chevron Global Technology Services
100 Chevron Way 51-2126
Richmond, California 94802

### 2.5.3. LOT NUMBERS

Batch 1 (run 1970)
Batch 2 (run 1972)
Batch 3 (run 1973)
Batch 5 (run 1975)
Batch 6 (run 1976)
Batch 7 (run 1986)
Batch 9 (run 2022)

### 2.5.4. PURITY ANALYSIS

100% Gasoline Isobutanol Vapor Condensate

### 2.5.5. DESCRIPTION

Colorless liquid

### 2.5.6. EXPIRATION DATE

Not available, stable per MSDS.

### 2.5.7. ANALYSIS

Documentation of the identity, strength, purity, composition, stability, and method of synthesis, fabrication, and/or derivation of the test substance and the maintenance of these records were the responsibility of the Sponsor. There was ~2–3% of isobutanol in the vapor condensate.

Certificates of Analysis (COA), or equivalent documentation from Chevron Global Technology Services, was provided to the Testing Facility for the test substance for inclusion in the final report (Annex 1).

### 2.5.8. STORAGE

Stored in an outside solvent shed, except when being used in the inhalation laboratory.

### 2.5.9. DISPENSING

The test substance was received from Chevron in 40 small (5 gallon) cylinders and 2 large (100 gallon) cylinders. Only 5-gallon cylinders were used for exposure operations, therefore, the test substance was dispensed, as needed, at the Testing Facility from the 100-gallon cylinders into 5-gallon cylinders using nitrogen pressurization. The small cylinders were unable to be completely emptied and thus retained approximately 5 to 10% of their original contents, which resulted in a need to blend two different lot numbers for exposure operations.

### 2.5.10. ARCHIVAL SAMPLE

A sample from each lot of test substance was stored in the Archives of the Testing Facility under conditions specified for test substance storage.

#### 2.5.11. DISPOSITION

The unused portion of the test substance and any empty test substance containers will be returned to the Sponsor at time of report finalization.

## 2.6. TEST ANIMALS

### 2.6.1. SPECIES

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

### 2.6.2. SUPPLIER

Charles River Laboratories
Kingston, New York 12484

### 2.6.3. NUMBER OF ANIMALS

Received/Placed on test: 96 time-mated females

The female rats selected for breeding were nulliparous and preferably virgin.

### 2.6.4. AGE AT RECEIPT

The animals were approximately 10-12 weeks of age at receipt on GD 1 to 3, where GD 0 was the day of detection of a copulatory plug *in situ* and/or sperm in a vaginal smear.

### 2.6.5. WEIGHT AT INITIATION OF DOSING

The weight range was 202.8 to 317.9 grams prior to commencement of dosing on GD 5.

### 2.6.6. PRETEST PERIOD

A 1 to 3 day pretest period was completed prior to commencement of dosing. All animals were examined during the pretest period to confirm suitability for study.

## 2.7. ANIMAL ASSIGNMENT

Animals were randomly assigned to control or treated groups upon arrival (24 animals/group). Prior to exposure, the body weights obtained on GD 4 were reviewed to ensure minimization of inter-group variability.

## 2.8. ANIMAL IDENTIFICATION

Upon receipt, each rat was tattooed on the tail with a number assigned by the Testing Facility. 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 that was color-coded for dose 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. HUSBANDRY

### 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 Academies Press, 2011. Envigo, East Millstone, New Jersey is fully accredited by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC).

### 2.10.2. HOUSING

Female rats were housed individually since they were presumed pregnant and individual food consumption was necessary to assess maternal toxicity. Animals were housed in solid-bottomed cages with cellulose-based contact bedding (7070C Teklad Diamond Dry, Harlan Laboratories, Madison, WI).

### 2.10.3. ENVIRONMENTAL ENRICHMENT

An enrichment device (e.g., Nylabone®) was provided in each animal's cage at all times.

### 2.10.4. FEED

Certified Global 18% Protein Rodent Diet (2018C pellets) (Harlan Teklad, Madison, Wisconsin) was available without restriction. Fresh feed was presented every 1 to 3 days. Animals did not have access to food during the exposure period.

### 2.10.5. FEED ANALYSIS

Analysis of feed was performed by the supplier. Results are maintained on file by the manufacturer. Results were provided to the Testing Facility and are maintained on file at the Testing Facility. There were no known contaminants in the feed that were expected to interfere with the results of this study.

### 2.10.6. WATER

Water (New Jersey-American Water Company, Cherry Hill, New Jersey) was available without restriction via an automated watering system. Animals did not have access to water during the exposure period.

### 2.10.7. WATER ANALYSIS

Water analyses are conducted by New Jersey-American Water Company, Cherry Hill, 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 which were expected to interfere with the results of this study.

### 2.10.8. ENVIRONMENTAL CONDITIONS

**Light/Dark Cycle**

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

**Temperature**

Monitored and maintained within the range of 20 to 26 °C and 30 to 70%.

Although conditions were occasionally outside the indicated ranges, these deviations were minor and/or of short duration and were not considered to have influenced the health of the animals and/or the outcome of the study.

## 2.11. TEST SUBSTANCE PREPARATION

Gasoline Isobutanol Vapor Condensate was used as supplied by the Sponsor.

## 2.12. TEST SUBSTANCE ADMINISTRATION

Inhalation - whole-body exposures.

Details of administration and analysis of the test atmospheres together with the results obtained are presented in Annex 3.

## 2.13. FREQUENCY AND DURATION OF ADMINISTRATION

Once daily for 6 hours/day, 7 days per week for 15 consecutive days, from GD 5 to 19, inclusive, where GD 0 is the day of detection of mating (copulatory plug *in situ* and/or sperm in a vaginal smear).

## 2.14. EXPERIMENTAL EVALUATIONS

### 2.14.1. VIABILITY CHECKS AND CLINICAL OBSERVATIONS (CAGE-SIDE)

Animals were observed in their cages twice daily (once in the morning and once in the afternoon) for mortality and general

condition. All animals were observed continuously during each inhalation exposure.

#### 2.14.2. PHYSICAL EXAMINATIONS

Animals were removed from their cages and examined daily from GD 4 through terminal euthanasia. During the stabilization and post-exposure periods, these evaluations were performed in the morning. During the treatment period, these evaluations were performed post-exposure. Examinations included observations of general condition, skin and fur, eyes, nose, oral cavity, abdomen and external genitalia as well as evaluations of respiration.

#### 2.14.3. BODY WEIGHT

Animals were removed from their cages and weighed on Gestation Day (GD) 4 (prior to treatment) and daily from GD 5 to 20 (treatment period).

#### 2.14.4. FOOD CONSUMPTION

Feed was available without restriction 7 days/week. Animals were presented with full feeders of known weight. Feeders were reweighed and the resulting weight was subtracted from the full feeder weight to obtain the grams consumed per day. Food consumption was measured (weighed) on GD 4 to 5, 5 to 6, 6 to 9, 9 to 12, 12 to 15, 15 to 18, 18 to 19 and 19 to 20.

### 2.15. TERMINAL OBSERVATIONS

Scheduled sacrifice was on GD 20.

#### 2.15.1. METHOD OF EUTHANASIA

All adult females were euthanized by carbon dioxide inhalation followed by exsanguination. Live fetuses were euthanized by intraperitoneal injection of sodium pentobarbital.

#### 2.15.2. MATERNAL SACRIFICES

A necropsy (macroscopic examination) comprised of an external examination followed by an internal examination (excluding the

cranial cavity) was performed. Minor sporadic lesions common to this strain of animal (i.e. localized patchy hair loss) were not sampled.

The intact uterus (ovaries attached) was removed from the abdominal cavity. It was weighed for all animals. Corpora lutea were counted and the number per ovary recorded for all animals. The uterus was then opened and the number and location of the following were recorded for each uterine horn:

- live fetuses
- dead fetuses (recently dead, no significant degeneration)
- late embryo-fetal deaths (recognizable dead embryo/fetus undergoing degeneration, regardless of size)
- early embryonic deaths (evidence of implantation, but no recognizable embryo), or stain-positive (see below)

The placenta associated with each fetus was examined macroscopically and weighed.

For apparently non-pregnant animals, and for apparently empty uterine horns, the number of implantation sites were checked by ammonium sulfide staining of the uterus (method modified from Salewski, E., 1964).

### 2.15.3. FETAL EXAMINATIONS

**External Examinations**

All live GD 20 fetuses were weighed, sexed, individually identified and examined externally for abnormalities, including examination of the eyes and palate.

All resorptions were discarded.

**Soft Tissue (Visceral) Examinations**

Following external examination, approximately one-half of the live fetuses in each litter (nominally alternating fetuses within the uterus) were euthanized and placed in Modified Davidson's fixative for preservation and decalcification. These fetuses were examined for soft tissue abnormalities by means of a combination

of a micro-dissection technique derived from that of Staples (1974) for examination of the torso, and a free-hand slicing technique derived from that of Wilson and Warkany (1965) for examination of head and heart structures. During the examination, the sex of each fetus was determined by inspection of the gonads.

**Skeletal Examinations**

Following external examination, approximately one-half of the live fetuses in each litter (nominally, alternating fetuses within the uterus) were euthanized, sexed by internal inspection, then eviscerated and processed for staining of the skeleton with Alizarin Red S. These preparations were then examined for skeletal abnormalities, including any affecting discernible cartilaginous structures, and for ossification state.

## 2.16. STATISTICAL ANALYSIS

The following parameters were analyzed statistically:

maternal body weight
maternal body weight changes
food consumption
fetal weights per litter
placental weights per litter
litter size
count of corpora lutea
count of implantation sites
percent pre-implantation loss
percent post-implantation loss (resorptions and early/fetal deaths)
sex ratio per litter

### 2.16.1. METHOD OF ANALYSIS

The parameters to analyze were identified as continuous, discrete or binary. Test-article treated groups were then compared to the control using the following procedures.

For all parameters, significant differences between control and test article-treated groups were expressed at the 5% ($p<0.05$) or the 1% ($p<0.01$) level.

**Continuous Parameters**

If Bartlett's test for variance homogeneity (Bartlett, 1937) was not significant at the 1% level, then parametric methods were applied. If the F1 approximate test for monotonicity (described below) of dose-response was not significant at the 1% level, Williams' test (Williams', 1971, 1972) for a monotonic trend was applied. If the F1 test was significant, suggesting that the dose-response was not monotone, Dunnett's test (Dunnett, 1955, 1964) was performed instead. If Bartlett's test was significant at the 1% level, then logarithmic and square-root transformations were tried. If Bartlett's test was still significant, then non-parametric methods were applied to mean ranks. If the H1 approximate test for monotonicity (described below) was not significant at the 1% level, Shirley's test for a monotonic trend (Shirley, 1977) was applied. If the H1 test was significant, then Steel's test (Steel, 1959) was performed instead.

The F1 test is designed to detect significant departure from monotonicity of an ordered set of means. The test statistic compares the mean square, NMS, for the deviations of the absolute or adjusted means from the maximum likelihood means, calculated under a constraint of monotonicity, with the usual error mean square, EMS. The null hypothesis is that the true means are monotonically ordered. The test statistic is F1 = NMS/EMS which can be compared with standard tables of the F-distribution with 1 and error degrees of freedom.

The H1 test is the non-parametric equivalent of the F1 test. The test statistic compares the non-monotonicity sums of squares, NRSS, for the deviations of the mean ranks from the maximum likelihood mean ranks, with the non-parametric equivalent of the error sums of squares, ERSS=N(N+1)/12. The test statistic is H1 = NRSS/ERSS which can be compared to standard tables of the $\chi$2-distribution with 1 degree of freedom.

**Discrete Parameters**

If the Jonckheere-Terpstra test (Jonckheere, 1954) was significant at the 5% level, then the direction of the trend was established and one-tailed step-down testing in this direction was performed. If the

Jonckheere-Terpstra test was not significant at the 5% level, then the Kruskal-Wallis test (Kruskal and Wallis, 1952, 1953) was applied. If the Kruskal-Wallis test was significant at the 5% level, the test-article treated groups were compared to the control using exact Wilcoxon rank sum tests (Wilcoxon, 1945), otherwise, no further comparisons were made.

**Binary Parameters**

If the Cochran-Armitage test (Armitage, 1955) was significant at the 5% level, then the direction of the trend was established and one-tailed step-down testing in this direction was performed. If the Cochran-Armitage test was not significant at the 5% level, then the $\chi 2$ test (Armitage et al 2002) was applied. If the $\chi 2$ test was significant at the 5% level, the test-article treated groups were compared to the control using Fisher's Exact tests (Fisher, 1973), otherwise, no further comparisons were made.

## 2.17. MAJOR COMPUTER SYSTEMS

The following major computer/software systems were utilized at Envigo, East Millstone, New Jersey.

| System | Version | Use |
|---|---|---|
| AmegaView Environmental Monitoring System | 3 | Monitoring of environmental conditions within the pharmacy |
| Liberate Reporting System | 2.2 | Generation of report tables in MS Word formats for data collected using the Xybion Path/Tox System |
| Microsoft Word and/or Excel | | Additional formatting of report tables. |
| Quasar | 1.4 | Statistical analysis of data |
| REES Scientific Environmental Monitoring System | WIN 1.5 | Monitor and record temperature, humidity and/or light intensity readings of applicable rooms as |

| | | |
|---|---|---|
| | | well as the temperature readings of applicable refrigerators and/freezers |
| TSI Aerodynamic Particle Sizer Spectrometer | 2.9 | Acquisition of particle size data |
| Xybion Path/Tox System | 4.2.2 | Direct online capture of in-life and postmortem evaluations and generation of report tables for the anatomic pathology data |
| Xybion Pristima® System | 7.0 | Documentation of receipt and tracking of substances received by Pharmacy |

## 2.18. DATA STORAGE

All raw data, preserved specimens, and retained samples, as well as the original study protocol and the original final report are maintained in the Archives of the Testing Facility upon completion of the study. The Sponsor will determine the final disposition of these materials. Electronic raw data generated at the Testing Facility are maintained on the computer system on which the data application resides, or archived off-line.

## 2.19. REGULATORY REFERENCES

### 2.19.1. TEST GUIDELINES

This study was designed to meet or exceed the pertinent requirements of:

- Organization for Economic Cooperation and Development (22 January 2001). OECD Guidelines for Testing of Chemicals; OECD Guideline 414: Prenatal Developmental Toxicity Study.
- US EPA (Environmental Protection Agency) Health Effects Test Guidelines, OPPTS 870.3700, Prenatal Developmental Toxicity Study EPA 712-C-98-207, August 1998.
- US EPA Vehicle Emissions Inhalation Exposure Guideline 79.61, CFR Vol. 59, No. 122, 27 June 1994.

### 2.19.2. GOOD LABORATORY PRACTICES

This study was conducted in compliance with the following Good Laboratory Practices:

- Organization for Economic Cooperation and Development (OECD) Principles of Good Laboratory Practices ENV/MC/CHEM/(98)17
- US EPA 79.60, CFR Vol. 59, No. 122, 27 June 1994.

### 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 deviation occurred during the study but was not considered to have compromised the validity or integrity of the study:

On GD 5, exposure Day 1, Animal Nos. 3549, 3550, 3551, 3552, 3553, 3554, 4573, 4574 and 4575 were inadvertently given a physical in the morning prior to first exposure. Following exposure, these animals were given another detailed physical in the afternoon as per protocol.

# 3. RESULTS AND DISCUSSION

## 3.1. CHAMBER MONITORING RESULTS

**(Annex 2 and Annex 3)**

Gas chromatography analysis (see Annex 2) of the major components in the neat test substance and the test atmospheres showed a reasonably close comparison between the neat test substance and the vaporized test substance. These data demonstrated that the test animals were exposed, as expected, to all of the major components of the test substance in their reasonably proper proportion. The data were consistent from week-to-week during the study indicating stability of the test substance and the atmosphere generation techniques.

Overall target, nominal and achieved (per IR analysis) mean exposure concentrations (see Annex 3) are summarized below:

| Group | Test Substance | Atmosphere Concentration ($mg/m^3$) | | |
|---|---|---|---|---|
| | | Target | Nominal | Achieved |
| 1 | Air Control | 0 | 0 | 0 |
| 2 | Gasoline Isobutanol Vapor Condensate | 2,000 | 2,455 | 2,043 |
| 3 | Gasoline Isobutanol Vapor Condensate | 10,000 | 11,270 | 10,410 |
| 4 | Gasoline Isobutanol Vapor Condensate | 20,000 | 20,280 | 20,720 |

By IR analysis, no Gasoline Isobutanol Vapor Condensate was detected in Group 1 samples. Mean atmosphere concentrations were 2.2%, 4.1% and 3.6% above target for Groups 2, 3 and 4, respectively.

The differences between the nominal and measured concentrations for Groups 2 and 3 may be attributed to the limited sensitivity of the balance used to weigh test substance storage cylinders and the small volume of test substance dispensed during each exposure.

Particle size analysis confirmed the absence of condensation aerosol in all groups during pretest evaluations and throughout the study.

Oxygen levels during animal exposure met protocol requirements of 19% or higher.

All room environmental monitoring for test substance, light and sound were within protocol specifications.

## 3.2. MATERNAL DATA

### 3.2.1. MORTALITY

**(Table 1, Appendix A)**

All animals survived until the completion of exposures.

### 3.2.2. CLINICAL OBSERVATIONS

**(Table 2, Appendix B)**

There were no test substance-related clinical signs.

### 3.2.3. GESTATION BODY WEIGHTS

**(Table 3, Table 4, Appendix C, Appendix D)**

There were no test substance-related effects on body weights.

### 3.2.4. GESTATION FOOD CONSUMPTION

**(Table 5, Appendix E)**

There were no test substance-related effects on food consumption.

### 3.2.5. PREGNANCY OUTCOME AND CESAREAN SECTION DATA

**(Table 7, Table 8, Appendix G)**

There were no test substance-related effects on pregnancy outcome and cesarean section data.

### 3.2.6. MACROSCOPIC

**(Table 6, Appendix F)**

There were no test substance-related effects on grossly examined organs.

## 3.3. FETAL DATA

### 3.3.1. GRAVID UTERINE, PLACENTAL AND FETAL WEIGHTS

**(Table 9, Table 10, Appendix H, Appendix I)**

There were no test substance-related effects on gravid uterine weights, litter weights, fetal weights and placental weights.

### 3.3.2. FETAL OBSERVATIONS

**(Table 11, Table 12, Table 13, Appendix J)**

There were no test substance-related effects on fetal external, visceral and skeletal development.

There were 312, 306, 330 and 292 fetuses from 23, 24, 24 and 23 litters from the 0 (Air), 2,000, 10,000, or 20,000 $mg/m^3$ Gasoline Isobutanol Vapor Condensate groups examined for external findings, respectively. Of these, 156, 152, 165 and 145 fetuses from the respective litters and groups were further examined for visceral findings while 156, 154, 165 and 147 fetuses from the respective litters and groups were examined for skeletal findings.

All fetal findings (external, visceral and skeletal) were not considered related to the test substance as they were low in incidence, not present in an exposure level-related manner, were common in this strain of laboratory animal and/or were generally within current published Charles River Laboratory Historical Control Data (HCD) values (2011 through 2013 [GD 20 and GD 21 rat fetuses]).

It should be noted that in cases when treatment results in true teratogenesis, all of the manifestations of developmental toxicity (post-implantation loss [resorptions], malformation and reduced fetal weights) are generally increased at term. In this study, none

of these manifestations was increased significantly compared to control.

## 4. CONCLUSION

Whole-body inhalation exposure of Gasoline Isobutanol Vapor Condensate at 2,000, 10,000 and 20,000 mg/m$^3$ was not associated with any effects on time-mated female rats and their fetuses.

Under the conditions of this study, the NOEL (no observable effect level) for Gasoline Isobutanol Vapor Condensate was considered to be 20,000 mg/m$^3$ for maternal and developmental effects.

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## CALCULATIONS

**Food Consumption:**

Grams of food consumed per interval ÷ Number of days = grams/day

**Gravid Uterine Adjusted Body Weights:**

Adj Bwt Day 20 = Body weight on Day 20 – Gravid Uterine Weight

Adj Bwt change Days 5-20 = Adjusted body weight Day 20 – Body weight on Day 5

**Pre-implantation Loss:**

Number of corpora lutea - Number of implantations

**Percent Pre-implantation Loss:**

(Number of corpora lutea - Number of implantations) ÷ Number of corpora lutea x100

**Post-implantation Loss:**

Total number of resorptions + number of dead fetuses

**Percent Post-implantation Loss:**

(Total number of resorptions and dead fetuses) ÷ Number of implantation sites x 100

**Sex Ratio (% Males):**

(Number of male pups ÷ Number of total pups) x 100

## GENERAL PREFACE

Individual animal data presented in this report may be rounded. Unrounded individual animal data were 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.

The data collection system used for collecting the in-life and post-life data divides the study into phases. The phases presented in this report are:

Gestation Phase (GES): Begins the day of detection of a copulatory plug *in situ* and/or sperm in a vaginal smear (GD 0).

**Corresponding exposure levels for each group were as follows:**

Group 1 - 0 $mg/m^3$
Group 2 - 2,000 $mg/m^3$
Group 3 - 10,000 $mg/m^3$
Group 4 - 20,000 $mg/m^3$

| Females | Summary of Survival | Table 1 |
|---|---|---|

| Dose Group | 1 | | 2 | | 3 | | 4 | |
|---|---|---|---|---|---|---|---|---|
| Dose Level (mg/m3) | 0 | | 2000 | | 10000 | | 20000 | |
| | N | (%) | N | (%) | N | (%) | N | (%) |
| Number of females entered on study | 24 | | 24 | | 24 | | 24 | |
| Removed before scheduled termination | | | | | | | | |
| Died | 0 | (0) | 0 | (0) | 0 | (0) | 0 | (0) |
| Moribund/elective sacrifice | 0 | (0) | 0 | (0) | 0 | (0) | 0 | (0) |
| Total | 0 | (0) | 0 | (0) | 0 | (0) | 0 | (0) |

| Females | Summary of Clinical Observations | Table 2 |
|---|---|---|

| | Phase | GES | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Day | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| | Session | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY |
| Observations | Group | | | | | | | | | | | | | | | |
| Examined | 1 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| | 2 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| | 3 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| | 4 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| Within Normal Limits | 1 | 24 | 24 | 24 | 24 | 23 | 22 | 23 | 23 | 22 | 22 | 21 | 20 | 20 | 19 | 19 |
| | 2 | 24 | 24 | 24 | 24 | 24 | 24 | 23 | 23 | 23 | 23 | 22 | 21 | 21 | 21 | 21 |
| | 3 | 24 | 24 | 24 | 24 | 23 | 23 | 23 | 23 | 23 | 24 | 24 | 24 | 23 | 22 | 22 |
| | 4 | 24 | 24 | 24 | 23 | 24 | 23 | 23 | 23 | 23 | 23 | 22 | 22 | 22 | 21 | 21 |
| Dermal General, Alopecia (Head/Neck) | 1 | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | | | | |
| | 3 | | | | | 1 | 1 | 1 | 1 | 1 | | | | | | |
| Dermal General, Alopecia (Limbs) | 1 | | | | | 1 | 1 | | | | 1 | 2 | 4 | 4 | 5 | 5 |
| | 2 | | | | | | | | | | | 1 | 2 | 2 | 2 | 2 |
| | 3 | | | | | | | | | | | | | 1 | 2 | 2 |
| | 4 | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 3 |
| Dermal General, Alopecia (Torso) | 1 | | | | | | | | | | | | 1 | 1 | 1 | 1 |
| | 2 | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 4 | | | | | | | | | | | 1 | 1 | 1 | 1 | 2 |
| Dermal General, Scab(s) | 1 | | | | | | | | | 1 | | | | | | |

GES = gestation, PHY = physical examination

| Females | Summary of Clinical Observations | Table 2 |
|---|---|---|

| | Phase | GES | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Day | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| | Session | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY |
| Observations | Group | | | | | | | | | | | | | | | |
| Ocular, Chromodacryorrhea (Unilateral) | 4 | | | | 1 | | | | | | | | | | | |

GES = gestation, PHY = physical examination

| Females | Summary of Clinical Observations | Table 2 |
|---|---|---|

| | Phase | GES | |
|---|---|---|---|
| | Day | 19 | 20 |
| | Session | PHY | PHY |
| Observations | Group | | |
| Examined | 1 | 24 | 24 |
| | 2 | 24 | 24 |
| | 3 | 24 | 24 |
| | 4 | 24 | 24 |
| Within Normal Limits | 1 | 17 | 17 |
| | 2 | 21 | 21 |
| | 3 | 20 | 20 |
| | 4 | 18 | 19 |
| Dermal General, Alopecia (Limbs) | 1 | 7 | 7 |
| | 2 | 3 | 3 |
| | 3 | 4 | 3 |
| | 4 | 5 | 5 |
| Dermal General, Alopecia (Torso) | 1 | 1 | 2 |
| | 3 | 1 | 1 |
| | 4 | 2 | 2 |
| Dermal General, Piloerection | 4 | 1 | |

GES = gestation, PHY = physical examination

| Females | Mean Gestation Body Weights (g) | Table 3 |
|---|---|---|

| Phase | GES | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| Group 1 - 0 mg/m3 | | | | | | | | | | | | |
| Mean | 251.3 | 245.8 | 250.2 | 253.8 | 256.9 | 261.9 | 269.0 | 274.2 | 279.6 | 283.8 | 289.7 | 297.0 |
| SD | 17.49 | 15.12 | 16.47 | 14.95 | 15.70 | 15.01 | 15.16 | 15.13 | 15.81 | 15.81 | 15.57 | 16.62 |
| N | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |
| Group 2 - 2000 mg/m3 | | | | | | | | | | | | |
| Mean | 256.3 | 251.5 | 255.2 | 259.7 | 264.5 | 270.3 | 276.1 | 284.5 | 288.9 | 294.5 | 300.3 | 308.0 |
| SD | 22.27 | 20.81 | 19.49 | 20.57 | 20.75 | 20.56 | 20.30 | 20.52 | 21.32 | 22.06 | 21.07 | 23.08 |
| N | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| Group 3 - 10000 mg/m3 | | | | | | | | | | | | |
| Mean | 250.5 | 249.1 | 248.7 | 252.4 | 257.2 | 261.6 | 268.9 | 277.1 | 282.0 | 287.3 | 294.0 | 300.9 |
| SD | 17.59 | 17.20 | 19.28 | 18.03 | 18.40 | 19.78 | 19.05 | 19.39 | 19.38 | 19.82 | 20.53 | 20.63 |
| N | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| Group 4 - 20000 mg/m3 | | | | | | | | | | | | |
| Mean | 256.0 | 253.2 | 255.2 | 259.0 | 263.8 | 268.2 | 276.4 | 283.1 | 287.0 | 292.6 | 297.0 | 304.0 |
| SD | 21.16 | 21.79 | 21.65 | 22.36 | 22.53 | 23.37 | 22.52 | 23.81 | 24.02 | 24.26 | 24.39 | 26.55 |
| N | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |

No statistically significant differences from control mean; GES = gestation

| Females | Mean Gestation Body Weights (g) | Table 3 |
|---|---|---|

| Phase | GES | | | | |
|---|---|---|---|---|---|
| Day | 16 | 17 | 18 | 19 | 20 |
| Group 1 - 0 mg/m3 | | | | | |
| Mean | 307.4 | 319.5 | 333.7 | 346.9 | 371.2 |
| SD | 17.27 | 18.28 | 20.37 | 20.30 | 23.21 |
| N | 23 | 23 | 23 | 23 | 23 |
| Group 2 - 2000 mg/m3 | | | | | |
| Mean | 316.6 | 329.7 | 342.5 | 355.1 | 381.0 |
| SD | 24.07 | 26.56 | 27.40 | 29.20 | 29.95 |
| N | 24 | 24 | 24 | 24 | 24 |
| Group 3 - 10000 mg/m3 | | | | | |
| Mean | 312.0 | 324.6 | 339.3 | 353.3 | 379.1 |
| SD | 21.58 | 21.92 | 22.75 | 24.37 | 26.11 |
| N | 24 | 24 | 24 | 24 | 24 |
| Group 4 - 20000 mg/m3 | | | | | |
| Mean | 313.7 | 325.6 | 339.0 | 351.9 | 377.6 |
| SD | 27.16 | 29.57 | 32.67 | 34.90 | 38.58 |
| N | 23 | 23 | 23 | 23 | 23 |

No statistically significant differences from control mean; GES = gestation

| Females | Mean Gestation Body Weight Changes (g) | Table 4 |
|---|---|---|

| Phase | GES | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Day | 4-5 | 5-6 | 6-9 | 9-12 | 12-15 | 15-18 | 18-19 | 19-20 | 5-19 | 5-20 |
| Group 1 - 0 mg/m3 | | | | | | | | | | |
| Mean | -5.6 | 4.4 | 11.7 | 17.7 | 17.4 | 36.7 | 13.2 | 24.4 | 101.1 | 125.5 |
| SD | 7.37 | 3.69 | 3.76 | 4.13 | 4.23 | 6.06 | 2.80 | 5.44 | 13.94 | 14.92 |
| N | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |
| Group 2 - 2000 mg/m3 | | | | | | | | | | |
| Mean | -4.7 | 3.7 | 15.1 | 18.6 | 19.0 | 34.5 | 12.7 | 25.9 | 103.6 | 129.5 |
| SD | 5.40 | 3.47 | 4.01 | 4.15 | 5.83 | 7.97 | 5.61 | 4.70 | 20.02 | 21.24 |
| N | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| Group 3 - 10000 mg/m3 | | | | | | | | | | |
| Mean | -1.4 | -0.4 | 12.9 | 20.4 | 18.9 | 38.4 | 14.0 | 25.8 | 104.2 | 130.0 |
| SD | 6.75 | 7.47 | 5.73 | 5.46 | 5.17 | 5.56 | 3.42 | 5.54 | 17.24 | 19.14 |
| N | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| Group 4 - 20000 mg/m3 | | | | | | | | | | |
| Mean | -2.7 | 1.9 | 13.1 | 18.8 | 17.0 | 35.0 | 12.8 | 25.7 | 98.7 | 124.4 |
| SD | 6.27 | 6.30 | 4.26 | 3.69 | 6.63 | 10.09 | 3.96 | 5.48 | 20.90 | 24.48 |
| N | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |

No statistically significant differences from control mean; GES = gestation

| Females | Mean Gestation Food Consumption Values (g/animal/day) | Table 5 |
|---|---|---|

| Phase | GES | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Day | 4-5 | 5-6 | 6-9 | 9-12 | 12-15 | 15-18 | 18-19 | 19-20 | 5-19 | 5-20 |
| Group 1 - 0 mg/m3 | | | | | | | | | | |
| Mean | 21.6 | 22.2 | 21.7 | 22.4 | 22.8 | 24.4 | 24.5 | 22.3 | 22.9 | 22.9 |
| SD | 2.68 | 2.84 | 1.84 | 2.09 | 2.10 | 2.60 | 2.22 | 2.65 | 1.96 | 1.93 |
| N | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |
| Group 2 - 2000 mg/m3 | | | | | | | | | | |
| Mean | 22.4 | 23.6 | 23.3 | 24.0 | 24.4 | 25.1 | 26.0 | 23.0 | 24.3 | 24.2 |
| SD | 3.29 | 2.54 | 2.19 | 2.31 | 2.36 | 3.12 | 2.94 | 2.40 | 1.82 | 1.78 |
| N | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| Group 3 - 10000 mg/m3 | | | | | | | | | | |
| Mean | 22.5 | 21.9 | 22.8 | 23.8 | 24.5 | 26.3 | 26.5 | 22.9 | 24.3 | 24.2 |
| SD | 3.09 | 2.90 | 2.71 | 2.26 | 2.20 | 1.87 | 2.84 | 4.37 | 1.91 | 1.94 |
| N | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| Group 4 - 20000 mg/m3 | | | | | | | | | | |
| Mean | 23.0 | 22.6 | 22.8 | 23.1 | 23.3 | 25.4 | 25.0 | 23.8 | 23.7 | 23.7 |
| SD | 2.96 | 3.20 | 2.37 | 2.19 | 2.70 | 2.93 | 4.07 | 4.57 | 2.27 | 2.30 |
| N | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |

No statistically significant differences from control mean; GES = gestation

| Females | Incidence Summary Report for Gross Necropsy Observations | Table 6 |
|---|---|---|

Huntingdon Life Sciences
Mettlers Road
P.O. Box 2360
Rat/CD IGS

Incidence Summary Report for Gross Necropsy Observations by Animal
Study number: 14-4418
All Sacrifices
Study start date: 27-May-15

Printed: 15-Sep-15
Page: 1

Segment II/Inhalation

| | -- Females -- | | | |
|---|---|---|---|---|
| Group: | 1 | 2 | 3 | 4 |
| Number in group: | 24 | 24 | 24 | 24 |
| Within Normal Limits ..... | 24 | 24 | 24 | 24 |

| Females | Pregnancy Summary | Table 7 |
|---|---|---|

| Dose Group | 1 | | 2 | | 3 | | 4 | |
|---|---|---|---|---|---|---|---|---|
| Dose Level (mg/m3) | 0 | | 2000 | | 10000 | | 20000 | |
| | N | (%) | N | (%) | N | (%) | N | (%) |
| Number of females entered on study (mated) | 24 | | 24 | | 24 | | 24 | |
| - Non pregnant | 1 | (4) | 0 | (0) | 0 | (0) | 1 | (4) |
| - Pregnant | 23 | (96) | 24 | (100) | 24 | (100) | 23 | (96) |
| Pregnant with termination before scheduled date | 0 | | 0 | | 0 | | 0 | |
| Pregnant at scheduled termination | 23 | | 24 | | 24 | | 23 | |
| - With total implantation loss | 0 | (0) | 0 | (0) | 0 | (0) | 0 | (0) |
| - With viable fetuses | 23 | (100) | 24 | (100) | 24 | (100) | 23 | (100) |

Summary of Cesarean Section Data — Table 8

| | Corpora Lutea | Implant-ations | Resorptions Early | Resorptions Late | Resorptions Total | Dead Fetuses | Live Fetuses Male | Live Fetuses Female | Live Fetuses Total | Sex Ratio (% Male) | Pre Impl. Loss (%) | Post Impl. Loss (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | | | | | | | |
| Mean | 14.9 | 14.0 | 0.4 | 0.0 | 0.4 | 0.0 | 6.5 | 7.0 | 13.6 | 48.1 | 5.6 | 3.1 |
| SD | 1.36 | 1.13 | 0.66 | 0.00 | 0.66 | 0.00 | 2.09 | 2.12 | 1.20 | 14.97 | 5.97 | 4.64 |
| N | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |
| Group 2 - 2000 mg/m3 | | | | | | | | | | | | |
| Mean | 14.6 | 13.6 | 0.9 | 0.0 | 0.9 | 0.0 | 6.9 | 5.9 | 12.8 | 52.8 | 7.0 | 7.4 |
| SD | 2.45 | 2.41 | 1.26 | 0.00 | 1.26 | 0.00 | 2.91 | 2.33 | 3.04 | 16.12 | 7.47 | 12.37 |
| N | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| Group 3 - 10000 mg/m3 | | | | | | | | | | | | |
| Mean | 15.1 | 14.4 | 0.6 | 0.0 | 0.7 | 0.0 | 7.0 | 6.7 | 13.8 | 50.6 | 4.5 | 4.6 |
| SD | 2.46 | 2.22 | 0.97 | 0.20 | 1.09 | 0.00 | 2.46 | 1.92 | 2.36 | 14.00 | 5.32 | 7.31 |
| N | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| Group 4 - 20000 mg/m3 | | | | | | | | | | | | |
| Mean | 14.3 | 13.7 | 0.9 | 0.0 | 1.0 | 0.0 | 6.3 | 6.4 | 12.7 | 51.1 | 3.8 | 8.6 |
| SD | 3.90 | 3.70 | 1.12 | 0.21 | 1.11 | 0.00 | 2.80 | 2.48 | 3.88 | 16.57 | 5.03 | 16.56 |
| N | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |

Impl = implantation
No statistically significant differences from control mean

| Females | Summary of Gravid Uterine Adjusted Body Weights | Table 9 |
|---|---|---|

| | Bodyweight on Day 5 | Bodyweight on Day 20 | Bwt change Days 5-20 | Gravid Uterine Weight | Adj Bwt Day 20 | Adj bwt change Days 5-20 |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | |
| Mean | 246 | 371 | 125 | 83.53 | 288 | 42 |
| SD | 15 | 23 | 15 | 9.182 | 20 | 13 |
| N | 23 | 23 | 23 | 23 | 23 | 23 |
| Group 2 - 2000 mg/m3 | | | | | | |
| Mean | 252 | 381 | 130 | 80.52 | 301 | 49 |
| SD | 21 | 30 | 21 | 18.133 | 23 | 12 |
| N | 24 | 24 | 24 | 24 | 24 | 24 |
| Group 3 - 10000 mg/m3 | | | | | | |
| Mean | 249 | 379 | 130 | 84.51 | 295 | 46 |
| SD | 17 | 26 | 19 | 14.438 | 23 | 19 |
| N | 24 | 24 | 24 | 24 | 24 | 24 |
| Group 4 - 20000 mg/m3 | | | | | | |
| Mean | 253 | 378 | 124 | 79.51 | 298 | 45 |
| SD | 22 | 39 | 24 | 23.400 | 22 | 14 |
| N | 23 | 23 | 23 | 23 | 23 | 23 |

Bwt = body weight, Adj = adjusted
No statistically significant differences from control mean

| | Mean Placental, Litter and Fetal Weights (g) | Table 10 |
|---|---|---|

| | Mean Placental Weights | Total Litter Weight | Mean Fetal Weight Male | Female | Overall |
|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | |
| Mean | 0.5 | 52.4 | 4.0 | 3.8 | 3.9 |
| SD | 0.05 | 7.02 | 0.41 | 0.38 | 0.38 |
| N | 23 | 23 | 23 | 23 | 23 |
| Group 2 - 2000 mg/m3 | | | | | |
| Mean | 0.5 | 50.8 | 4.1 | 3.9 | 4.0 |
| SD | 0.06 | 12.29 | 0.22 | 0.20 | 0.21 |
| N | 24 | 24 | 24 | 24 | 24 |
| Group 3 - 10000 mg/m3 | | | | | |
| Mean | 0.5 | 53.3 | 4.0 | 3.8 | 3.9 |
| SD | 0.05 | 10.06 | 0.43 | 0.44 | 0.42 |
| N | 24 | 24 | 24 | 24 | 24 |
| Group 4 - 20000 mg/m3 | | | | | |
| Mean | 0.6 | 50.0 | 4.0 | 3.8 | 3.9 |
| SD | 0.10 | 15.54 | 0.24 | 0.24 | 0.21 |
| N | 23 | 23 | 23 | 22 | 23 |

No statistically significant differences from control mean

| | Summary of Fetal External Observations | Table 11 |
|---|---|---|

| | | Fetuses | | | | Litters | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | Dose Level (mg/m3) | 0 | 2000 | 10000 | 20000 | 0 | 2000 | 10000 | 20000 |
| Observation | External Examinations | 312 | 306 | 330 | 292 | 23 | 24 | 24 | 23 |
| No abnormality detected | | 310 | 306 | 330 | 292 | 21 | 24 | 24 | 23 |
| Skin/subcutis | | | | | | | | | |
| Forelimb(s), subcutaneous hemorrhage | | 1 | | | | 1 | | | |
| Head, subcutaneous hemorrhage | | 1 | | | | 1 | | | |

Summary of Fetal Visceral Observations Table 12

| Observation | Group | Fetuses 1 | 2 | 3 | 4 | Litters 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| | Dose Level (mg/m3) | 0 | 2000 | 10000 | 20000 | 0 | 2000 | 10000 | 20000 |
| | Visceral Examinations | 156 | 152 | 165 | 145 | 23 | 24 | 24 | 23 |
| No abnormalities detected | | 125 | 106 | 105 | 98 | 1 | 1 | 3 | 1 |
| Abdomen | | | | | | | | | |
| Abdominal cavity, hemorrhage(s) | | | 2 | | | | 2 | | |
| Abdominal region, subcutaneous, edema | | | 1 | 4 | 1 | | 1 | 4 | 1 |
| Testis, malpositioned | | 2 | 6 | 3 | 4 | 2 | 5 | 3 | 4 |
| Testis, undescended | | | 2 | | 1 | | 2 | | 1 |
| Umbilical artery | | | 2 | 3 | 1 | | 2 | 3 | 1 |
| Brain | | | | | | | | | |
| 3rd ventricle, dilated | | | | 1 | | | | 1 | |
| Cerebellum, subdural, hemorrhage(s) | | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 2 |
| Cerebellum, subdural, small, hemorrhage(s) | | | | | 1 | | | | 1 |
| Medulla oblongata, hemorrhage(s) | | 2 | | | 1 | 2 | | | 1 |
| Medulla oblongata, small, hemorrhage(s) | | | 1 | 1 | | | 1 | 1 | |
| Cervical | | | | | | | | | |
| Thymus gland, partially undescended | | 4 | 4 | 4 | 5 | 4 | 3 | 3 | 3 |
| Thyroid gland, enlarged | | | | 1 | | | | 1 | |
| Head | | | | | | | | | |
| Cranial region, posterior, subdural, hemorrhage(s) | | 1 | | | | 1 | | | |
| Cranial region, subcutaneous, hemorrhage(s) | | 2 | 1 | | | 2 | 1 | | |

Summary of Fetal Visceral Observations — Table 12

| Observation | | Fetuses | | | | Litters | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | Dose Level (mg/m3) | 0 | 2000 | 10000 | 20000 | 0 | 2000 | 10000 | 20000 |
| | Visceral Examinations | 156 | 152 | 165 | 145 | 23 | 24 | 24 | 23 |
| Heart | | | | | | | | | |
| Pericardium, hemorrhage | | | 1 | | | | 1 | | |
| Kidney/ureter | | | | | | | | | |
| Renal papilla, small | | 1 | | 2 | 1 | 1 | | 2 | 1 |
| Renal pelvis, dilated | | 2 | 1 | 3 | 2 | 2 | 1 | 3 | 2 |
| Renal pelvis, dilated, small | | | 1 | | | | 1 | | |
| Ureter, dilated | | 1 | 2 | 4 | 1 | 1 | 2 | 3 | 1 |
| Limbs | | | | | | | | | |
| Left forelimb, small, hemorrhage(s) | | | | 1 | | | | 1 | |
| Liver | | | | | | | | | |
| Median liver lobe, additional | | 15 | 17 | 18 | 19 | 12 | 12 | 10 | 9 |
| Thorax | | | | | | | | | |
| Aortic arch, interrupted | | | | | 1 | | | | 1 |

Summary of Fetal Visceral Observations Table 12

| Observation | Group | Fetuses 1 | 2 | 3 | 4 | Litters 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| | Dose Level (mg/m3) | 0 | 2000 | 10000 | 20000 | 0 | 2000 | 10000 | 20000 |
| | Visceral Examinations | 156 | 152 | 165 | 145 | 23 | 24 | 24 | 23 |
| Thorax | | | | | | | | | |
| Caudal vena cava, left hepatic vein, anomalous confluence | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Diaphragm, small, thinning, with liver protrusion(s) | | 2 | 4 | 2 | 5 | 2 | 3 | 1 | 5 |
| Diaphragm, thinning, with liver protrusion(s) | | | 6 | 3 | 2 | | 4 | 2 | 2 |
| Innominate artery, absent | | | | 1 | | | | 1 | |
| Innominate artery, short | | 1 | 1 | 2 | 3 | 1 | 1 | 2 | 3 |
| Subclavian artery, arises from ductus arterios | | | | | 1 | | | | 1 |
| Subclavian artery, arises from aortic arch | | | | 1 | | | | 1 | |
| Thoracic cavity, hemorrhage(s) | | | | 1 | | | | 1 | |
| Whole body | | | | | | | | | |
| Whole body, edema | | | 1 | | | | 1 | | |
| Whole body, edema, subcutaneous | | | 1 | | | | 1 | | |

Summary of Fetal Skeletal Observations Table 13

| Observation | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| | Dose Level (mg/m3) | 0 | 2000 | 10000 | 20000 | 0 | 2000 | 10000 | 20000 |
| | Skeletal Examinations | 156 | 154 | 165 | 147 | 23 | 24 | 24 | 23 |
| Caudal vertebrae | | | | | | | | | |
| Caudal vertebra centrum(a), unossified | | | | 2 | | | | 1 | |
| Caudal vertebral arch(es), incompletely ossified | | | 1 | 3 | | | 1 | 2 | |
| Caudal vertebral arch(es), unossified | | 2 | | 4 | | 2 | | 1 | |
| Cervical vert. | | | | | | | | | |
| Cervical rib | | | | 1 | | | | 1 | |
| Cervical vert. centrum(a), 5 ossified | | 4 | | | 2 | 2 | | | 1 |
| Cervical vert. centrum(a), 6 ossifed | | 2 | | 1 | 3 | 1 | | 1 | 1 |
| Cervical vert. centrum(a), ossified center | | 1 | 4 | 6 | 4 | 1 | 2 | 4 | 2 |
| Cervical vertebral arch(es), incompletely ossified | | 5 | | 1 | | 1 | | 1 | |
| Cervical vertebral arch(es), ossified center | | 3 | | | | 1 | | | |
| Girdles | | | | | | | | | |
| Ischium, incompletely ossified | | 3 | 1 | 2 | 2 | 2 | 1 | 2 | 2 |
| Ischium, unossified | | 1 | | 1 | | 1 | | 1 | |
| Pelvic girdle, (left sided), unilateral caudal shift | | 1 | | | | 1 | | | |
| Pubis, fissure | | 1 | | | | 1 | | | |
| Pubis, incompletely ossified | | 14 | 4 | 9 | 3 | 9 | 4 | 6 | 3 |
| Pubis, unossified | | 3 | | 4 | | 1 | | 1 | |
| Head bones | | | | | | | | | |
| Frontal, incompletely ossified | | 1 | | 1 | | 1 | | 1 | |

vert. = vertebra(e)/vertebral

Summary of Fetal Skeletal Observations Table 13

| Observation | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| | Dose Level (mg/m3) | 0 | 2000 | 10000 | 20000 | 0 | 2000 | 10000 | 20000 |
| | Skeletal Examinations | 156 | 154 | 165 | 147 | 23 | 24 | 24 | 23 |
| Head bones | | | | | | | | | |
| Hyoid body, incompletely ossified | | 6 | 12 | 11 | 6 | 6 | 8 | 6 | 3 |
| Hyoid body, unossified | | 23 | 17 | 21 | 13 | 12 | 10 | 13 | 7 |
| Interparietal, incompletely ossified | | 8 | 7 | 14 | 3 | 6 | 6 | 9 | 3 |
| Jugal, incompletely ossified | | 2 | 3 | 2 | | 2 | 3 | 2 | |
| Maxilla/jugal, incompletely ossified | | | | 2 | | | | 1 | |
| Parietal, incompletely ossified | | 3 | 4 | 4 | 2 | 3 | 4 | 2 | 2 |
| Presphenoid, incompletely ossified | | 3 | | | | 2 | | | |
| Squamosal, incompletely ossified | | 4 | 3 | 12 | 1 | 3 | 3 | 5 | 1 |
| Supraoccipital, incompletely ossified | | 7 | 4 | 5 | | 4 | 4 | 4 | |
| Limb bones | | | | | | | | | |
| ,metacarpal, incompletely ossified | | 2 | 2 | 3 | | 1 | 2 | 1 | |
| ,metacarpal, unossified | | 15 | 11 | 17 | 12 | 5 | 6 | 6 | 4 |
| ,metatarsal, incompletely ossified | | | | 3 | | | | 1 | |
| ,metatarsal, unossified | | | | 2 | | | | 1 | |
| Metacarpal, incompletely ossified | | | | 4 | | | | 2 | |
| Metacarpal, unossified | | | | 1 | | | | 1 | |
| Phalanx, 1 ossified | | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Phalanx, 2 ossified | | 1 | | 1 | 2 | 1 | | 1 | 2 |
| Phalanx, 3 ossified | | | | 1 | 1 | | | 1 | 1 |
| Phalanx, 4 ossified | | 8 | 2 | 4 | 6 | 2 | 2 | 3 | 2 |

Summary of Fetal Skeletal Observations Table 13

| Observation | Group | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| | Dose Level (mg/m3) | 0 | 2000 | 10000 | 20000 | 0 | 2000 | 10000 | 20000 |
| | Skeletal Examinations | 156 | 154 | 165 | 147 | 23 | 24 | 24 | 23 |
| Lumbar vertebrae | | | | | | | | | |
| Lumbar vertebral centrum(a), asymmetrically ossified | | | | 1 | | | | 1 | |
| Lumbar vertebral centrum(a), dumbbell ossified | | 1 | | | | 1 | | | |
| Lumbar vertebral centrum(a), incompletely ossified | | 1 | | 1 | | 1 | | 1 | |
| No abnormality detected | | | | | | | | | |
| | | 205 | 209 | 215 | 197 | 23 | 24 | 24 | 22 |
| Ribs | | | | | | | | | |
| 13th, misshapen | | | | 1 | | | | 1 | |
| 13th, short | | 1 | 1 | | | 1 | 1 | | |
| Left rib, incompletely ossified | | | | 1 | | | | 1 | |
| Left rib, short | | | | 1 | | | | 1 | |
| Right rib, short | | | 1 | 1 | 2 | | 1 | 1 | 2 |
| Sacral vertebrae | | | | | | | | | |
| Sacral vertebral arch(es), incompletely ossified | | | | 2 | | | | 1 | |
| Sacral vertebral arch(es), unossified | | | | 2 | | | | 1 | |
| Sacrocaudal vert. arch(es), incompletely ossified | | 11 | 5 | 4 | 3 | 4 | 3 | 3 | 2 |
| Sacrocaudal vert. arch(es), unossified | | | | | 1 | | | | 1 |
| Sternebrae | | | | | | | | | |
| Sternebral center(s), fused | | | | | 1 | | | | 1 |

vert. = vertebra(e)/vertebral

Summary of Fetal Skeletal Observations Table 13

| Observation | Group / Dose Level (mg/m3) / Skeletal Examinations | 1 0 156 | 2 2000 154 | 3 10000 165 | 4 20000 147 | 1 0 23 | 2 2000 24 | 3 10000 24 | 4 20000 23 |
|---|---|---|---|---|---|---|---|---|---|
| Sternebrae | | | | | | | | | |
| Sternebral center(s), incompletely ossified | | 6 | | 2 | 1 | 1 | | 2 | 1 |
| Suture/fontanel. | | | | | | | | | |
| Frontal suture, sutural bone | | | | | 1 | | | | 1 |
| Thoracic vert. | | | | | | | | | |
| Thoracic vert. centrum(a), asymmetrically ossified | | 1 | | 2 | 1 | 1 | | 2 | 1 |
| Thoracic vert. centrum(a), bipartite ossified | | 2 | | 5 | 3 | 2 | | 5 | 3 |
| Thoracic vert. centrum(a), dumbbell ossified | | 9 | 7 | 12 | 2 | 6 | 6 | 9 | 2 |
| Thoracic vert. centrum(a), incompletely ossified | | 4 | 3 | 14 | 11 | 3 | 3 | 10 | 6 |
| Thoracic vert. centrum(a), unossified | | 4 | 1 | 3 | 5 | 2 | 1 | 1 | 4 |
| Variants | | | | | | | | | |
| 14th rib, full | | | | | 1 | | | | 1 |
| 14th rib, short | | 5 | 2 | 3 | 2 | 3 | 2 | 2 | 2 |
| Sternebra(e), incompletely ossified | | 69 | 66 | 68 | 48 | 20 | 19 | 21 | 20 |
| Sternebra(e), unossified | | 33 | 15 | 33 | 26 | 12 | 10 | 15 | 15 |

vert. = vertebra(e)/vertebral

| Females | Individual Animal Termination History | Appendix A |
|---|---|---|

| Animal Number | Date of Death | Type of Death | Phase | Phase Day[a] |
|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | |
| 1501 | 16 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 1502 | 16 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 1503 | 16 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 1504 | 16 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 1505 | 16 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 1506 | 16 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 1507 | 17 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 1508 | 17 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 1509 | 17 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 1510 | 17 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 1511 | 17 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 1512 | 17 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 1513 | 18 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 1514 | 18 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 1515 | 18 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 1516 | 18 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 1517 | 18 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 1518 | 18 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 1519 | 19 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 1520 | 19 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 1521 | 19 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 1522 | 19 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 1523 | 19 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 1524 | 19 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |

[a]First day of each phase defined as Day 1. First day of test article administration defined as Gestation Day 5

| Females | Individual Animal Termination History | Appendix A |
|---|---|---|

| Animal Number | Date of Death | Type of Death | Phase | Phase Day[a] |
|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | |
| 2525 | 16 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 2526 | 16 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 2527 | 16 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 2528 | 16 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 2529 | 16 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 2530 | 16 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 2531 | 17 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 2532 | 17 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 2533 | 17 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 2534 | 17 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 2535 | 17 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 2536 | 17 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 2537 | 18 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 2538 | 18 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 2539 | 18 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 2540 | 18 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 2541 | 18 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 2542 | 18 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 2543 | 19 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 2544 | 19 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 2545 | 19 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 2546 | 19 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 2547 | 19 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 2548 | 19 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |

[a]First day of each phase defined as Day 1. First day of test article administration defined as Gestation Day 5

| Females | Individual Animal Termination History | Appendix A |
|---|---|---|

| Animal Number | Date of Death | Type of Death | Phase | Phase Day[a] |
|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | |
| 3549 | 16 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 3550 | 16 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 3551 | 16 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 3552 | 16 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 3553 | 16 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 3554 | 16 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 3555 | 17 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 3556 | 17 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 3557 | 17 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 3558 | 17 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 3559 | 17 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 3560 | 17 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 3561 | 18 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 3562 | 18 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 3563 | 18 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 3564 | 18 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 3565 | 18 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 3566 | 18 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 3567 | 19 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 3568 | 19 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 3569 | 19 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 3570 | 19 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 3571 | 19 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 3572 | 19 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |

[a]First day of each phase defined as Day 1. First day of test article administration defined as Gestation Day 5

| Females | Individual Animal Termination History | Appendix A |
|---|---|---|

| Animal Number | Date of Death | Type of Death | Phase | Phase Day[a] |
|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | |
| 4573 | 16 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 4574 | 16 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 4575 | 16 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 4576 | 16 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 4577 | 16 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 4578 | 16 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 4579 | 17 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 4580 | 17 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 4581 | 17 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 4582 | 17 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 4583 | 17 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 4584 | 17 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 4585 | 18 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 4586 | 18 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 4587 | 18 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 4588 | 18 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 4589 | 18 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 4590 | 18 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 4591 | 19 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 4592 | 19 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 4593 | 19 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 4594 | 19 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 4595 | 19 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |
| 4596 | 19 Jun 15 | Terminal sacrifice | GESTATION PHASE | 20 |

[a]First day of each phase defined as Day 1. First day of test article administration defined as Gestation Day 5

| Females | Individual Clinical Observations | Appendix B |
|---|---|---|

| Animal Number | Observations | Phase / Day / Session | GES 4 PHY | 5 PHY | 6 PHY | 7 PHY | 8 PHY | 9 PHY | 10 PHY | 11 PHY | 12 PHY | 13 PHY | 14 PHY | 15 PHY | 16 PHY | 17 PHY | 18 PHY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3/day | | | | | | | | | | | | | | | | | |
| 1501 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1502 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1503 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1504 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | | | | | |
| | Dermal general, alopecia (limbs) | | | | | | | | | | | | 2 | 2 | 2 | 2 | 2 |
| 1505 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1506 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | | | | |
| | Dermal general, alopecia (limbs) | | | | | | | | | | | | | 2 | 2 | 2 | 2 |
| 1507 | Within normal limits | | P | P | P | P | P | | | | | | | | | | |
| | Dermal general, alopecia (limbs) | | | | | | | | | | | | | 2 | 2 | 2 | 2 |
| | Dermal general, alopecia (head/neck) | | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | | | | |
| | Dermal general, alopecia (torso) | | | | | | | | | | | | | 2 | 2 | 2 | 2 |
| 1508 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1509 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |

P = present, 2 = moderate, GES = gestation, PHY = physical examination

| Females | Individual Clinical Observations | Appendix B |
|---|---|---|

| Animal Number | Observations | Phase / Day / Session | GES 4 PHY | 5 PHY | 6 PHY | 7 PHY | 8 PHY | 9 PHY | 10 PHY | 11 PHY | 12 PHY | 13 PHY | 14 PHY | 15 PHY | 16 PHY | 17 PHY | 18 PHY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3/day | | | | | | | | | | | | | | | | | |
| 1510 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | | |
| | Dermal general, alopecia (limbs) | | | | | | | | | | | | | | | 2 | 2 |
| 1511 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1512 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1513 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1514 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1515 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1516 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1517 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1518 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1519 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |

P = present, 2 = moderate, GES = gestation, PHY = physical examination

| Females | Individual Clinical Observations | Appendix B |
|---|---|---|

| Animal Number | Observations | Phase | GES | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Day | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| | | Session | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY |
| Group 1 - 0 mg/m3/day | | | | | | | | | | | | | | | | | | |
| 1520 | Within normal limits | | P | P | P | P | | | P | P | | | | | | | | |
| | Dermal general, alopecia (limbs) | | | | | | 2 | 2 | | | | 2 | 2 | 2 | 2 | 2 | 2 |
| | Dermal general, scab(s), forepaw(s), left | | | | | | | | | | 1 | | | | | | |
| 1521 np | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1522 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1523 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1524 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| Group 2 - 2000 mg/m3/day | | | | | | | | | | | | | | | | | | |
| 2525 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2526 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2527 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2528 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |

np = not pregnant, P = present, 1 = slight, 2 = moderate, GES = gestation, PHY = physical examination

| Females | Individual Clinical Observations | Appendix B |
|---|---|---|

| Animal Number | Observations | Phase / Day / Session | GES 4 PHY | 5 PHY | 6 PHY | 7 PHY | 8 PHY | 9 PHY | 10 PHY | 11 PHY | 12 PHY | 13 PHY | 14 PHY | 15 PHY | 16 PHY | 17 PHY | 18 PHY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3/day | | | | | | | | | | | | | | | | | |
| 2529 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2530 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2531 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2532 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2533 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2534 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2535 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2536 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2537 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2538 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2539 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |

P = present, GES = gestation, PHY = physical examination

| Females | Individual Clinical Observations | Appendix B |
|---|---|---|

| Animal Number | Observations | Phase | GES | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Day | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| | | Session | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY | PHY |
| Group 2 - 2000 mg/m3/day | | | | | | | | | | | | | | | | | |
| 2540 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2541 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2542 | Within normal limits | | P | P | P | P | P | P | | | | | | | | | |
| | Dermal general, alopecia (torso) | | | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 2543 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2544 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2545 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2546 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2547 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | | | | | |
| | Dermal general, alopecia (limbs) | | | | | | | | | | | | 2 | 2 | 2 | 2 | 2 |
| 2548 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | | | | |
| | Dermal general, alopecia (limbs) | | | | | | | | | | | | | 2 | 2 | 2 | 2 |

P = present, 2 = moderate, GES = gestation, PHY = physical examination

| Females | Individual Clinical Observations | Appendix B |
|---|---|---|

| Animal Number | Observations | Phase / Day / Session | GES 4 PHY | 5 PHY | 6 PHY | 7 PHY | 8 PHY | 9 PHY | 10 PHY | 11 PHY | 12 PHY | 13 PHY | 14 PHY | 15 PHY | 16 PHY | 17 PHY | 18 PHY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3/day | | | | | | | | | | | | | | | | | |
| 3549 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3550 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3551 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3552 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3553 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3554 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| | Dermal general, alopecia (limbs) | | | | | | | | | | | | | | 2 | 2 | 2 |
| 3555 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3556 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3557 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3558 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3559 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |

P = present, 2 = moderate, GES = gestation, PHY = physical examination

| Females | Individual Clinical Observations | Appendix B |
|---|---|---|

| Animal Number | Observations | Phase / Day / Session | GES 4 PHY | 5 PHY | 6 PHY | 7 PHY | 8 PHY | 9 PHY | 10 PHY | 11 PHY | 12 PHY | 13 PHY | 14 PHY | 15 PHY | 16 PHY | 17 PHY | 18 PHY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3/day | | | | | | | | | | | | | | | | | |
| 3560 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3561 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3562 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3563 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3564 | Within normal limits | | P | P | P | P | | | | | | P | P | P | P | P | P |
| | Dermal general, alopecia (head/neck) | | | | | | 2 | 2 | 2 | 2 | 2 | | | | | | |
| 3565 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3566 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3567 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3568 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3569 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | | |
| | Dermal general, alopecia (limbs) | | | | | | | | | | | | | | | 2 | 2 |

P = present, 2 = moderate, GES = gestation, PHY = physical examination

| Females | Individual Clinical Observations | Appendix B |
|---|---|---|

| Animal Number | Observations | Phase / Day / Session | GES 4 PHY | 5 PHY | 6 PHY | 7 PHY | 8 PHY | 9 PHY | 10 PHY | 11 PHY | 12 PHY | 13 PHY | 14 PHY | 15 PHY | 16 PHY | 17 PHY | 18 PHY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3/day | | | | | | | | | | | | | | | | | |
| 3570 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3571 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3572 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| Group 4 - 20000 mg/m3/day | | | | | | | | | | | | | | | | | |
| 4573 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4574 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4575 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4576 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4577 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4578 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4579 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |

P = present, GES = gestation, PHY = physical examination

| Females | Individual Clinical Observations | Appendix B |
|---|---|---|

| Animal Number | Observations | Phase / Day / Session | GES 4 PHY | 5 PHY | 6 PHY | 7 PHY | 8 PHY | 9 PHY | 10 PHY | 11 PHY | 12 PHY | 13 PHY | 14 PHY | 15 PHY | 16 PHY | 17 PHY | 18 PHY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3/day | | | | | | | | | | | | | | | | | |
| 4580 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4581 | Within normal limits | | P | P | P | P | P | | | | | | | | | | |
| | Dermal general, alopecia (limbs) | | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | Dermal general, alopecia (torso) | | | | | | | | | | | | | | | | 2 |
| 4582 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4583 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4584 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4585 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4586 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4587 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4588 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4589 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |

P = present, 2 = moderate, GES = gestation, PHY = physical examination

| Females | Individual Clinical Observations | Appendix B |
|---|---|---|

| Animal Number | Observations | Phase / Day / Session | GES 4 PHY | 5 PHY | 6 PHY | 7 PHY | 8 PHY | 9 PHY | 10 PHY | 11 PHY | 12 PHY | 13 PHY | 14 PHY | 15 PHY | 16 PHY | 17 PHY | 18 PHY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3/day | | | | | | | | | | | | | | | | | |
| 4590 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4591 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4592 np | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4593 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | | |
| | Dermal general, alopecia (limbs) | | | | | | | | | | | | | | | 2 | 2 |
| 4594 | Within normal limits | | P | P | P | | P | P | P | P | P | P | P | P | P | P | P |
| | Ocular, chromodacryorrhea (unilateral) | | | | | P | | | | | | | | | | | |
| 4595 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | | | | | |
| | Dermal general, alopecia (limbs) | | | | | | | | | | | | | | 2 | 2 | 2 |
| | Dermal general, alopecia (torso) | | | | | | | | | | | | 2 | 3 | 3 | 3 | 3 |
| 4596 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |

np = not pregnant, P = present, 2 = moderate, 3 = extreme, GES = gestation, PHY = physical examination

| Females | Individual Clinical Observations | Appendix B |
|---|---|---|

| Animal Number | Observations | Phase | GES | |
|---|---|---|---|---|
| | | Day | 19 | 20 |
| | | Session | PHY | PHY |
| Group 1 - 0 mg/m3/day | | | | |
| 1501 | Within normal limits | | P | P |
| 1502 | Within normal limits | | P | P |
| 1503 | Within normal limits | | P | P |
| 1504 | Dermal general, alopecia (limbs) | | 2 | 3 |
| 1505 | Within normal limits | | P | P |
| 1506 | Dermal general, alopecia (limbs) | | 2 | 2 |
| | Dermal general, alopecia (torso) | | | 2 |
| 1507 | Dermal general, alopecia (limbs) | | 2 | 2 |
| | Dermal general, alopecia (torso) | | 2 | 2 |
| 1508 | Within normal limits | | P | P |
| 1509 | Within normal limits | | P | P |
| 1510 | Dermal general, alopecia (limbs) | | 2 | 2 |

P = present, 2 = moderate, 3 = extreme, GES = gestation, PHY = physical examination

| Females | Individual Clinical Observations | Appendix B |
|---|---|---|

| Animal Number | Observations | Phase | GES | |
|---|---|---|---|---|
| | | Day | 19 | 20 |
| | | Session | PHY | PHY |
| Group 1 - 0 mg/m3/day | | | | |
| 1511 | Within normal limits | | P | P |
| 1512 | Within normal limits | | P | P |
| 1513 | Within normal limits | | P | P |
| 1514 | Within normal limits | | P | P |
| 1515 | Within normal limits | | P | P |
| 1516 | Within normal limits | | P | P |
| 1517 | Within normal limits | | P | P |
| 1518 | Within normal limits | | P | P |
| 1519 | Dermal general, alopecia (limbs) | | 2 | 2 |
| 1520 | Dermal general, alopecia (limbs) | | 2 | 2 |
| 1521 np | Dermal general, alopecia (limbs) | | 2 | 2 |

np = not pregnant, P = present, 2 = moderate, GES = gestation, PHY = physical examination

| Females | Individual Clinical Observations | Appendix B |
|---|---|---|

| Animal Number | Observations | Phase | GES | |
|---|---|---|---|---|
| | | Day | 19 | 20 |
| | | Session | PHY | PHY |
| Group 1 - 0 mg/m3/day | | | | |
| 1522 | Within normal limits | | P | P |
| 1523 | Within normal limits | | P | P |
| 1524 | Within normal limits | | P | P |
| Group 2 - 2000 mg/m3/day | | | | |
| 2525 | Within normal limits | | P | P |
| 2526 | Within normal limits | | P | P |
| 2527 | Within normal limits | | P | P |
| 2528 | Within normal limits | | P | P |
| 2529 | Within normal limits | | P | P |
| 2530 | Within normal limits | | P | P |
| 2531 | Within normal limits | | P | P |

P = present, GES = gestation, PHY = physical examination

| Females | Individual Clinical Observations | Appendix B |
|---|---|---|

| Animal Number | Observations | Phase: GES<br>Day: 19<br>Session: PHY | 20<br>PHY |
|---|---|---|---|
| Group 2 - 2000 mg/m3/day | | | |
| 2532 | Within normal limits | P | P |
| 2533 | Within normal limits | P | P |
| 2534 | Within normal limits | P | P |
| 2535 | Within normal limits | P | P |
| 2536 | Within normal limits | P | P |
| 2537 | Within normal limits | P | P |
| 2538 | Within normal limits | P | P |
| 2539 | Within normal limits | P | P |
| 2540 | Within normal limits | P | P |
| 2541 | Within normal limits | P | P |
| 2542 | Within normal limits | P | P |

P = present, GES = gestation, PHY = physical examination

| Females | Individual Clinical Observations | Appendix B |
|---|---|---|

| Animal Number | Observations | Phase: GES Day: 19 Session: PHY | Day: 20 Session: PHY |
|---|---|---|---|
| Group 2 - 2000 mg/m3/day | | | |
| 2543 | Within normal limits | P | P |
| 2544 | Within normal limits | P | P |
| 2545 | Dermal general, alopecia (limbs) | 2 | 2 |
| 2546 | Within normal limits | P | P |
| 2547 | Dermal general, alopecia (limbs) | 2 | 3 |
| 2548 | Dermal general, alopecia (limbs) | 2 | 3 |
| Group 3 - 10000 mg/m3/day | | | |
| 3549 | Within normal limits | P | P |
| 3550 | Within normal limits | P | P |
| 3551 | Within normal limits | P | P |
| 3552 | Within normal limits | P | P |

P = present, 2 = moderate, 3 = extreme, GES = gestation, PHY = physical examination

| Females | Individual Clinical Observations | Appendix B |
|---|---|---|

| Animal Number | Observations | Phase: GES Day: 19 Session: PHY | Day: 20 Session: PHY |
|---|---|---|---|
| Group 3 - 10000 mg/m3/day | | | |
| 3553 | Within normal limits | P | P |
| 3554 | Dermal general, alopecia (limbs) | 2 | 2 |
| 3555 | Within normal limits | P | P |
| 3556 | Within normal limits | P | P |
| 3557 | Within normal limits | P | P |
| 3558 | Within normal limits | P | P |
| 3559 | Dermal general, alopecia (limbs)<br>Dermal general, alopecia (torso) | 2<br>2 | <br>2 |
| 3560 | Within normal limits | P | P |
| 3561 | Within normal limits | P | P |
| 3562 | Within normal limits | P | P |
| 3563 | Within normal limits | P | P |

P = present, 2 = moderate, GES = gestation, PHY = physical examination

| Females | Individual Clinical Observations | Appendix B |
|---|---|---|

| Animal Number | Observations | Phase: GES<br>Day: 19<br>Session: PHY | Day: 20<br>Session: PHY |
|---|---|---|---|
| Group 3 - 10000 mg/m3/day | | | |
| 3564 | Within normal limits | P | P |
| 3565 | Within normal limits | P | P |
| 3566 | Within normal limits | P | P |
| 3567 | Within normal limits | P | P |
| 3568 | Dermal general, alopecia (limbs) | 2 | 2 |
| 3569 | Dermal general, alopecia (limbs) | 2 | 2 |
| 3570 | Within normal limits | P | P |
| 3571 | Within normal limits | P | P |
| 3572 | Within normal limits | P | P |
| Group 4 - 20000 mg/m3/day | | | |
| 4573 | Dermal general, alopecia (limbs) | 2 | 2 |

P = present, 2 = moderate, GES = gestation, PHY = physical examination

| Females | Individual Clinical Observations | Appendix B |
|---|---|---|

| Animal Number | Observations | Phase: GES<br>Day: 19<br>Session: PHY | Day: 20<br>Session: PHY |
|---|---|---|---|
| Group 4 - 20000 mg/m3/day | | | |
| 4574 | Within normal limits | P | P |
| 4575 | Within normal limits | P | P |
| 4576 | Within normal limits | P | P |
| 4577 | Within normal limits | P | P |
| 4578 | Within normal limits | P | P |
| 4579 | Within normal limits | P | P |
| 4580 | Within normal limits | P | P |
| 4581 | Dermal general, alopecia (limbs)<br>Dermal general, alopecia (torso) | 2<br>2 | 2<br>2 |
| 4582 | Within normal limits | P | P |
| 4583 | Within normal limits | P | P |
| 4584 | Within normal limits | P | P |

P = present, 2 = moderate, GES = gestation, PHY = physical examination

| Females | Individual Clinical Observations | Appendix B |
|---|---|---|

| Animal Number | Observations | Phase: GES Day: 19 Session: PHY | Phase: GES Day: 20 Session: PHY |
|---|---|---|---|
| Group 4 - 20000 mg/m3/day | | | |
| 4585 | Within normal limits | P | P |
| 4586 | Within normal limits | P | P |
| 4587 | Within normal limits | P | P |
| 4588 | Within normal limits | P | P |
| 4589 | Within normal limits | P | P |
| 4590 | Within normal limits | P | P |
| 4591 | Dermal general, alopecia (limbs) | 2 | 2 |
| 4592 np | Within normal limits | P | P |
| 4593 | Dermal general, alopecia (limbs) | 2 | 2 |
| 4594 | Within normal limits | P | P |
| 4595 | Dermal general, alopecia (limbs) | 2 | 2 |
| | Dermal general, alopecia (torso) | 3 | 3 |

np = not pregnant, P = present, 2 = moderate, 3 = extreme, GES = gestation, PHY = physical examination

| Females | Individual Clinical Observations | Appendix B |
|---|---|---|

| Animal Number | Observations | Phase | GES | |
|---|---|---|---|---|
| | | Day | 19 | 20 |
| | | Session | PHY | PHY |
| Group 4 - 20000 mg/m3/day | | | | |
| 4596 | Within normal limits | | | P |
| | Dermal general, piloerection | | P | |

P = present, GES = gestation, PHY = physical examination

| Females | Individual Gestation Body Weights (g) | Appendix C |
|---|---|---|

| Animal Number | Phase Day | GES 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | | | | | | | | |
| 1501 | | 269.9 | 267.5 | 271.2 | 273.9 | 279.1 | 281.2 | 289.6 | 299.8 | 306.4 | 312.6 | 316.9 | 326.1 |
| 1502 | | 262.6 | 251.0 | 255.2 | 256.0 | 257.4 | 257.8 | 263.8 | 269.8 | 274.1 | 275.1 | 281.0 | 287.6 |
| 1503 | | 250.1 | 239.4 | 244.2 | 245.0 | 249.3 | 251.1 | 259.1 | 266.8 | 266.3 | 278.3 | 282.0 | 283.2 |
| 1504 | | 265.8 | 250.2 | 254.4 | 256.3 | 259.6 | 264.3 | 270.2 | 275.2 | 279.8 | 285.9 | 288.5 | 296.3 |
| 1505 | | 243.4 | 235.6 | 240.2 | 247.6 | 248.6 | 254.6 | 261.0 | 266.7 | 274.5 | 280.5 | 289.8 | 298.2 |
| 1506 | | 261.8 | 254.5 | 258.4 | 258.8 | 262.6 | 266.6 | 275.5 | 279.7 | 282.9 | 287.3 | 293.4 | 297.3 |
| 1507 | | 275.0 | 262.4 | 269.1 | 269.9 | 271.7 | 279.8 | 285.4 | 289.3 | 293.6 | 298.3 | 306.1 | 316.6 |
| 1508 | | 266.4 | 255.0 | 261.3 | 266.3 | 266.8 | 273.7 | 283.4 | 289.3 | 296.2 | 299.7 | 306.9 | 311.1 |
| 1509 | | 248.1 | 242.1 | 252.8 | 251.5 | 256.3 | 263.6 | 272.0 | 273.8 | 286.9 | 286.8 | 294.6 | 298.6 |
| 1510 | | 225.2 | 216.8 | 216.4 | 225.9 | 228.1 | 236.3 | 241.0 | 249.0 | 254.6 | 265.0 | 267.5 | 271.3 |
| 1511 | | 253.7 | 244.1 | 251.1 | 254.6 | 252.4 | 259.4 | 269.3 | 272.4 | 282.3 | 284.5 | 287.3 | 295.7 |
| 1512 | | 268.7 | 245.0 | 254.6 | 263.9 | 263.2 | 270.0 | 275.6 | 280.3 | 286.2 | 290.2 | 294.7 | 300.9 |
| 1513 | | 261.4 | 252.9 | 262.9 | 266.5 | 271.5 | 276.0 | 284.9 | 291.1 | 293.1 | 297.5 | 304.3 | 312.3 |
| 1514 | | 236.3 | 242.4 | 248.0 | 247.1 | 250.1 | 256.6 | 262.6 | 268.5 | 270.4 | 273.4 | 278.7 | 287.4 |
| 1515 | | 241.4 | 237.5 | 236.9 | 245.8 | 248.4 | 247.8 | 259.5 | 260.7 | 273.8 | 274.5 | 282.8 | 290.7 |
| 1516 | | 265.7 | 262.1 | 269.9 | 270.8 | 275.3 | 281.9 | 290.8 | 294.3 | 299.1 | 305.6 | 310.1 | 322.2 |
| 1517 | | 255.2 | 250.1 | 250.5 | 254.2 | 258.4 | 261.4 | 265.4 | 267.0 | 277.5 | 276.7 | 281.1 | 289.6 |
| 1518 | | 263.9 | 263.7 | 266.5 | 268.3 | 271.1 | 277.7 | 280.7 | 286.2 | 293.5 | 295.0 | 302.0 | 310.7 |
| 1519 | | 216.8 | 220.0 | 228.7 | 231.9 | 238.8 | 247.5 | 261.4 | 267.4 | 270.0 | 277.8 | 287.3 | 299.3 |
| 1520 | | 221.1 | 225.2 | 225.7 | 231.9 | 229.7 | 238.5 | 244.4 | 253.0 | 253.3 | 260.0 | 264.5 | 271.5 |
| 1521 np | | 226.7x | 220.5x | 219.8x | 228.0x | 235.3x | 237.3x | 243.8x | 247.4x | 245.6x | 245.6x | 247.0x | 247.7x |
| 1522 | | 257.3 | 257.9 | 257.1 | 263.2 | 269.4 | 270.7 | 273.8 | 281.6 | 285.1 | 288.4 | 293.6 | 298.1 |
| 1523 | | 217.6 | 216.2 | 213.9 | 220.8 | 223.8 | 229.6 | 234.4 | 238.3 | 240.5 | 240.3 | 250.2 | 256.5 |
| 1524 | | 253.2 | 260.7 | 264.6 | 266.1 | 276.0 | 277.1 | 283.0 | 286.4 | 290.2 | 294.8 | 299.2 | 309.0 |

np = not pregnant, x = excluded from calculation, GES = gestation

| Females | Individual Gestation Body Weights (g) | Appendix C |
|---|---|---|

| Animal Number | Phase Day | GES 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | | | | | | | | |
| 2525 | | 262.4 | 258.4 | 261.9 | 263.2 | 267.9 | 275.3 | 284.1 | 286.6 | 294.1 | 298.8 | 298.7 | 309.2 |
| 2526 | | 237.0 | 229.2 | 231.6 | 229.8 | 237.9 | 242.9 | 248.7 | 254.5 | 258.5 | 269.2 | 272.6 | 281.3 |
| 2527 | | 246.5 | 235.5 | 243.8 | 248.2 | 251.0 | 257.7 | 261.2 | 271.5 | 275.2 | 283.1 | 288.1 | 298.3 |
| 2528 | | 251.2 | 245.0 | 249.5 | 251.8 | 258.3 | 263.8 | 268.5 | 276.8 | 286.4 | 289.8 | 304.1 | 309.5 |
| 2529 | | 238.8 | 233.5 | 236.9 | 237.2 | 237.4 | 245.1 | 250.0 | 261.8 | 264.5 | 270.0 | 280.5 | 283.1 |
| 2530 | | 270.2 | 263.5 | 265.5 | 270.0 | 274.6 | 283.2 | 288.2 | 295.6 | 304.3 | 310.8 | 316.0 | 321.3 |
| 2531 | | 277.7 | 270.5 | 268.0 | 272.8 | 278.3 | 286.2 | 287.7 | 296.7 | 300.6 | 306.2 | 315.5 | 327.2 |
| 2532 | | 329.5 | 317.9 | 314.8 | 323.7 | 328.5 | 331.9 | 335.4 | 345.7 | 349.1 | 363.9 | 359.5 | 375.3 |
| 2533 | | 271.6 | 260.6 | 259.4 | 265.9 | 272.0 | 280.2 | 287.1 | 296.0 | 304.6 | 311.8 | 318.7 | 334.1 |
| 2534 | | 255.1 | 244.0 | 241.4 | 249.9 | 251.8 | 256.4 | 267.9 | 272.3 | 275.0 | 278.1 | 284.6 | 287.1 |
| 2535 | | 238.2 | 227.0 | 231.4 | 234.5 | 237.2 | 240.5 | 247.1 | 253.2 | 254.8 | 264.7 | 268.3 | 275.8 |
| 2536 | | 274.7 | 262.7 | 265.3 | 272.2 | 279.3 | 282.0 | 290.8 | 300.5 | 306.5 | 312.7 | 318.3 | 330.0 |
| 2537 | | 243.8 | 236.3 | 242.3 | 245.1 | 252.5 | 257.6 | 261.9 | 267.4 | 274.2 | 276.9 | 282.3 | 287.1 |
| 2538 | | 243.9 | 244.9 | 248.5 | 254.7 | 256.4 | 265.4 | 270.9 | 277.7 | 279.8 | 285.9 | 287.3 | 292.5 |
| 2539 | | 269.6 | 271.8 | 276.8 | 279.2 | 283.7 | 289.9 | 296.3 | 307.5 | 314.1 | 317.9 | 320.7 | 329.6 |
| 2540 | | 265.9 | 259.9 | 270.7 | 272.5 | 280.3 | 286.1 | 289.9 | 295.8 | 298.8 | 300.3 | 310.1 | 318.7 |
| 2541 | | 241.6 | 237.5 | 242.6 | 249.6 | 252.9 | 257.2 | 261.7 | 270.6 | 277.2 | 276.9 | 283.0 | 287.7 |
| 2542 | | 246.7 | 243.5 | 248.4 | 252.0 | 258.3 | 267.1 | 271.8 | 280.8 | 288.0 | 292.7 | 299.3 | 308.8 |
| 2543 | | 260.3 | 262.0 | 266.8 | 268.7 | 273.3 | 278.1 | 286.9 | 293.5 | 295.1 | 298.7 | 307.8 | 314.2 |
| 2544 | | 230.2 | 235.3 | 241.9 | 250.8 | 256.3 | 261.0 | 270.5 | 284.0 | 289.0 | 296.2 | 304.7 | 311.9 |
| 2545 | | 216.1 | 220.9 | 225.7 | 231.6 | 238.8 | 248.7 | 255.0 | 268.1 | 268.2 | 277.3 | 284.2 | 295.4 |
| 2546 | | 246.0 | 241.9 | 250.5 | 254.1 | 258.9 | 259.4 | 264.5 | 274.5 | 273.8 | 278.1 | 284.6 | 289.8 |
| 2547 | | 258.5 | 260.8 | 262.5 | 267.7 | 268.7 | 272.1 | 275.6 | 284.2 | 283.5 | 285.0 | 288.0 | 290.9 |
| 2548 | | 275.0 | 274.1 | 278.9 | 288.6 | 292.9 | 299.4 | 305.8 | 313.6 | 319.0 | 323.2 | 330.9 | 332.5 |

GES = gestation

| Females | Individual Gestation Body Weights (g) | Appendix C |
|---|---|---|

| Animal Number | Phase / Day | GES 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | | | | | | | | |
| 3549 | | 253.4 | 256.1 | 244.8 | 243.2 | 248.9 | 250.3 | 261.3 | 268.6 | 271.4 | 278.6 | 285.0 | 294.6 |
| 3550 | | 251.8 | 257.3 | 245.8 | 249.5 | 251.9 | 258.1 | 262.7 | 271.3 | 272.4 | 276.3 | 285.3 | 290.6 |
| 3551 | | 259.3 | 264.1 | 255.6 | 254.1 | 261.1 | 263.4 | 268.5 | 275.6 | 278.4 | 290.3 | 288.6 | 294.2 |
| 3552 | | 224.7 | 231.0 | 220.6 | 218.7 | 224.4 | 222.4 | 227.4 | 238.6 | 239.7 | 240.9 | 248.3 | 253.7 |
| 3553 | | 246.5 | 251.2 | 237.1 | 241.3 | 248.1 | 247.2 | 257.3 | 269.3 | 277.0 | 285.0 | 291.6 | 301.3 |
| 3554 | | 250.6 | 255.4 | 243.0 | 251.5 | 255.0 | 258.9 | 268.7 | 277.6 | 282.1 | 290.5 | 291.4 | 295.8 |
| 3555 | | 232.7 | 224.8 | 228.7 | 233.1 | 238.0 | 242.7 | 250.0 | 260.4 | 266.1 | 274.0 | 277.1 | 286.8 |
| 3556 | | 268.8 | 254.8 | 259.4 | 263.5 | 262.2 | 267.5 | 276.8 | 284.1 | 296.6 | 295.4 | 309.8 | 323.7 |
| 3557 | | 272.0 | 264.5 | 269.5 | 276.0 | 281.6 | 286.4 | 288.2 | 295.5 | 300.6 | 303.8 | 307.6 | 315.7 |
| 3558 | | 243.9 | 229.1 | 228.4 | 237.3 | 237.5 | 243.0 | 247.6 | 254.2 | 264.9 | 265.6 | 273.8 | 278.0 |
| 3559 | | 259.1 | 248.0 | 249.3 | 254.2 | 259.7 | 262.2 | 270.9 | 276.2 | 291.2 | 289.4 | 291.9 | 299.9 |
| 3560 | | 268.4 | 259.1 | 260.8 | 266.4 | 268.4 | 272.8 | 286.2 | 289.2 | 293.5 | 301.2 | 310.5 | 317.2 |
| 3561 | | 219.9 | 216.4 | 215.5 | 218.0 | 221.3 | 223.3 | 231.2 | 235.8 | 239.1 | 243.2 | 249.5 | 255.6 |
| 3562 | | 267.8 | 267.8 | 278.9 | 271.9 | 279.4 | 283.1 | 287.5 | 305.7 | 303.8 | 307.4 | 317.5 | 322.6 |
| 3563 | | 272.0 | 272.5 | 278.4 | 278.3 | 282.3 | 293.1 | 297.0 | 309.7 | 313.6 | 321.4 | 331.5 | 335.8 |
| 3564 | | 245.5 | 238.5 | 242.5 | 243.2 | 248.5 | 256.5 | 258.1 | 266.6 | 268.0 | 271.3 | 278.7 | 286.8 |
| 3565 | | 275.9 | 269.3 | 277.1 | 272.4 | 277.5 | 287.6 | 290.9 | 298.9 | 303.8 | 305.7 | 311.7 | 315.6 |
| 3566 | | 257.0 | 259.0 | 269.9 | 267.5 | 276.0 | 281.4 | 286.9 | 295.1 | 296.4 | 299.9 | 305.2 | 308.4 |
| 3567 | | 220.0 | 224.0 | 226.5 | 238.6 | 239.9 | 246.0 | 259.9 | 269.6 | 273.5 | 276.5 | 283.9 | 291.8 |
| 3568 | | 232.4 | 234.5 | 235.1 | 243.9 | 249.9 | 254.3 | 266.9 | 273.3 | 280.5 | 288.7 | 298.4 | 307.5 |
| 3569 | | 222.2 | 224.4 | 225.4 | 230.3 | 242.1 | 248.8 | 259.3 | 267.5 | 275.5 | 286.0 | 292.9 | 301.9 |
| 3570 | | 268.1 | 272.9 | 272.9 | 279.7 | 289.6 | 293.4 | 302.2 | 307.6 | 312.4 | 319.4 | 328.4 | 335.8 |
| 3571 | | 247.1 | 243.9 | 249.6 | 260.1 | 265.5 | 273.2 | 277.3 | 285.5 | 288.6 | 295.3 | 303.4 | 308.1 |
| 3572 | | 252.9 | 259.2 | 253.3 | 264.0 | 264.2 | 263.1 | 270.7 | 275.6 | 279.4 | 288.3 | 294.1 | 299.7 |

GES = gestation

| Females | Individual Gestation Body Weights (g) | Appendix C |
|---|---|---|

| Animal Number | Phase / Day | GES 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | | | | | | | | | |
| 4573 | | 239.6 | 245.6 | 237.9 | 235.3 | 241.5 | 244.2 | 254.0 | 259.1 | 267.4 | 266.9 | 274.4 | 280.6 |
| 4574 | | 260.5 | 268.7 | 255.1 | 256.5 | 269.6 | 263.4 | 271.5 | 277.2 | 278.0 | 282.2 | 284.9 | 294.7 |
| 4575 | | 273.2 | 281.0 | 266.5 | 274.0 | 281.5 | 285.1 | 289.6 | 301.8 | 303.1 | 312.9 | 311.8 | 321.9 |
| 4576 | | 231.9 | 223.3 | 227.7 | 229.7 | 237.6 | 239.6 | 247.5 | 257.1 | 261.4 | 266.8 | 270.7 | 279.2 |
| 4577 | | 247.5 | 240.5 | 244.5 | 244.5 | 251.0 | 255.8 | 264.9 | 272.1 | 273.5 | 282.0 | 285.5 | 290.7 |
| 4578 | | 277.6 | 269.7 | 271.6 | 274.9 | 276.7 | 275.7 | 287.6 | 295.7 | 298.6 | 306.4 | 306.9 | 316.6 |
| 4579 | | 251.6 | 241.3 | 241.9 | 247.9 | 256.7 | 260.5 | 267.3 | 275.0 | 278.9 | 282.1 | 291.5 | 297.0 |
| 4580 | | 285.7 | 270.3 | 275.1 | 285.3 | 287.9 | 289.4 | 304.2 | 306.6 | 311.3 | 320.5 | 324.0 | 338.8 |
| 4581 | | 286.4 | 283.0 | 282.0 | 288.6 | 288.7 | 299.5 | 304.3 | 311.3 | 315.8 | 321.2 | 325.2 | 333.1 |
| 4582 | | 252.4 | 238.4 | 237.2 | 243.2 | 242.8 | 247.5 | 255.6 | 258.9 | 262.0 | 264.6 | 267.0 | 268.6 |
| 4583 | | 224.9 | 217.0 | 215.5 | 223.6 | 226.9 | 228.2 | 235.9 | 238.5 | 238.2 | 248.0 | 247.1 | 251.8 |
| 4584 | | 244.5 | 243.1 | 244.6 | 251.6 | 249.8 | 257.9 | 268.2 | 275.0 | 279.8 | 285.6 | 296.3 | 302.0 |
| 4585 | | 247.8 | 244.0 | 250.5 | 253.9 | 257.2 | 261.2 | 273.8 | 279.8 | 284.1 | 290.1 | 293.3 | 303.4 |
| 4586 | | 259.7 | 260.5 | 265.2 | 270.4 | 272.5 | 277.6 | 290.4 | 295.8 | 293.9 | 300.7 | 306.9 | 290.9 |
| 4587 | | 263.0 | 260.6 | 266.8 | 263.5 | 272.7 | 282.5 | 287.4 | 297.7 | 298.6 | 303.4 | 309.0 | 317.7 |
| 4588 | | 269.3 | 268.5 | 275.5 | 274.0 | 278.6 | 287.6 | 291.9 | 302.6 | 306.8 | 310.4 | 316.1 | 321.9 |
| 4589 | | 259.1 | 253.3 | 261.3 | 264.4 | 270.9 | 276.3 | 282.2 | 293.2 | 299.5 | 299.8 | 306.6 | 317.9 |
| 4590 | | 268.6 | 265.8 | 275.1 | 277.5 | 282.1 | 286.1 | 292.7 | 296.9 | 303.1 | 305.2 | 310.1 | 313.3 |
| 4591 | | 240.6 | 241.4 | 244.6 | 253.3 | 256.7 | 265.2 | 278.6 | 277.9 | 288.4 | 296.6 | 292.9 | 309.1 |
| 4592 np | | 224.6x | 230.8x | 234.2x | 238.8x | 239.8x | 246.2x | 253.7x | 255.8x | 253.0x | 262.3x | 269.4x | 270.8x |
| 4593 | | 200.8 | 202.8 | 208.9 | 210.7 | 213.2 | 218.0 | 229.2 | 231.7 | 238.8 | 247.3 | 254.6 | 260.8 |
| 4594 | | 293.5 | 295.4 | 300.0 | 308.5 | 314.4 | 320.9 | 326.1 | 335.6 | 342.7 | 351.6 | 357.3 | 372.3 |
| 4595 | | 249.9 | 250.5 | 257.4 | 258.8 | 267.1 | 270.6 | 273.4 | 286.8 | 285.2 | 293.8 | 300.0 | 305.4 |
| 4596 | | 259.0 | 259.5 | 263.6 | 265.8 | 272.3 | 276.2 | 280.6 | 285.9 | 291.9 | 292.1 | 299.2 | 304.3 |

np = not pregnant, x = excluded from calculation, GES = gestation

| Females | Individual Gestation Body Weights (g) | Appendix C |
|---|---|---|

| Animal Number | Phase Day | GES 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | |
| 1501 | | 339.8 | 352.2 | 367.5 | 376.8 | 409.8 |
| 1502 | | 297.5 | 307.4 | 318.7 | 333.5 | 351.5 |
| 1503 | | 292.9 | 301.9 | 310.1 | 322.9 | 347.2 |
| 1504 | | 308.0 | 319.5 | 335.9 | 347.7 | 375.4 |
| 1505 | | 307.9 | 321.4 | 335.9 | 354.1 | 372.4 |
| 1506 | | 308.1 | 324.7 | 342.6 | 353.0 | 372.7 |
| 1507 | | 332.4 | 349.5 | 368.7 | 381.3 | 408.0 |
| 1508 | | 320.3 | 337.3 | 353.0 | 364.2 | 388.2 |
| 1509 | | 308.8 | 324.9 | 339.5 | 352.0 | 381.0 |
| 1510 | | 279.1 | 291.3 | 304.7 | 319.4 | 336.9 |
| 1511 | | 305.5 | 316.2 | 333.7 | 346.4 | 377.6 |
| 1512 | | 315.1 | 322.7 | 339.6 | 351.4 | 374.2 |
| 1513 | | 324.1 | 333.0 | 342.7 | 357.0 | 385.8 |
| 1514 | | 295.4 | 306.0 | 317.0 | 326.0 | 353.4 |
| 1515 | | 302.7 | 313.0 | 327.2 | 342.0 | 363.1 |
| 1516 | | 329.9 | 347.5 | 364.1 | 374.9 | 404.4 |
| 1517 | | 303.7 | 310.6 | 327.6 | 337.5 | 371.4 |
| 1518 | | 319.2 | 332.5 | 347.6 | 366.0 | 391.4 |
| 1519 | | 308.0 | 320.8 | 339.5 | 357.5 | 375.5 |
| 1520 | | 280.1 | 291.8 | 304.1 | 316.0 | 340.4 |
| 1521 np | | 246.0x | 248.6x | 249.6x | 252.5x | 263.1x |
| 1522 | | 307.3 | 318.1 | 326.5 | 339.0 | 363.6 |
| 1523 | | 267.4 | 280.8 | 288.4 | 302.1 | 314.6 |
| 1524 | | 317.2 | 324.3 | 339.6 | 357.3 | 379.8 |

np = not pregnant, x = excluded from calculation, GES = gestation

| Females | Individual Gestation Body Weights (g) | Appendix C |
|---|---|---|

| Animal Number | Phase Day | GES 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | |
| 2525 | | 317.7 | 330.7 | 344.2 | 360.9 | 381.6 |
| 2526 | | 288.5 | 306.0 | 316.8 | 331.1 | 362.0 |
| 2527 | | 309.8 | 320.8 | 340.3 | 357.2 | 381.2 |
| 2528 | | 318.5 | 338.7 | 353.2 | 365.1 | 382.7 |
| 2529 | | 292.0 | 305.3 | 322.4 | 335.1 | 358.7 |
| 2530 | | 334.0 | 355.1 | 365.6 | 379.8 | 404.0 |
| 2531 | | 338.3 | 352.1 | 362.6 | 375.1 | 409.7 |
| 2532 | | 383.6 | 398.8 | 416.4 | 431.7 | 456.5 |
| 2533 | | 340.8 | 358.4 | 369.7 | 385.2 | 422.5 |
| 2534 | | 294.3 | 301.6 | 310.8 | 312.0 | 336.6 |
| 2535 | | 283.7 | 297.8 | 306.8 | 324.0 | 349.6 |
| 2536 | | 340.5 | 353.1 | 369.9 | 376.7 | 406.9 |
| 2537 | | 290.2 | 295.3 | 314.6 | 316.8 | 348.9 |
| 2538 | | 304.9 | 315.5 | 327.7 | 345.0 | 368.9 |
| 2539 | | 337.7 | 354.5 | 371.7 | 378.5 | 401.0 |
| 2540 | | 329.1 | 342.3 | 353.5 | 363.6 | 389.7 |
| 2541 | | 293.0 | 307.0 | 318.5 | 322.1 | 350.7 |
| 2542 | | 319.5 | 332.0 | 343.0 | 357.8 | 384.8 |
| 2543 | | 322.3 | 339.1 | 351.8 | 371.9 | 391.8 |
| 2544 | | 322.5 | 339.2 | 346.1 | 365.5 | 391.2 |
| 2545 | | 304.5 | 315.1 | 330.6 | 350.3 | 375.7 |
| 2546 | | 298.7 | 310.9 | 321.3 | 338.1 | 364.6 |
| 2547 | | 290.9 | 288.0 | 296.2 | 301.3 | 320.3 |
| 2548 | | 342.7 | 355.1 | 365.4 | 378.3 | 405.0 |

| Females | Individual Gestation Body Weights (g) | Appendix C |
|---|---|---|

| Animal Number | Phase Day | GES 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3549 | | 308.9 | 320.8 | 337.2 | 355.3 | 380.9 |
| 3550 | | 301.6 | 311.6 | 328.1 | 345.8 | 371.9 |
| 3551 | | 303.9 | 314.0 | 323.8 | 338.2 | 364.6 |
| 3552 | | 260.5 | 274.5 | 285.7 | 293.9 | 318.3 |
| 3553 | | 315.3 | 326.1 | 342.6 | 355.7 | 382.8 |
| 3554 | | 308.5 | 325.4 | 342.5 | 358.0 | 363.4 |
| 3555 | | 294.1 | 303.8 | 316.7 | 330.0 | 349.2 |
| 3556 | | 327.7 | 347.4 | 359.1 | 376.5 | 410.4 |
| 3557 | | 332.2 | 347.2 | 369.3 | 389.8 | 417.9 |
| 3558 | | 289.0 | 302.1 | 319.6 | 332.3 | 356.9 |
| 3559 | | 310.5 | 321.5 | 334.7 | 347.6 | 373.2 |
| 3560 | | 326.1 | 339.5 | 357.6 | 376.6 | 403.2 |
| 3561 | | 268.3 | 281.6 | 293.3 | 303.7 | 328.3 |
| 3562 | | 335.2 | 342.6 | 354.4 | 368.9 | 390.3 |
| 3563 | | 352.3 | 368.2 | 377.6 | 385.7 | 414.2 |
| 3564 | | 296.9 | 308.7 | 326.9 | 340.2 | 367.3 |
| 3565 | | 330.2 | 338.1 | 351.2 | 361.0 | 389.1 |
| 3566 | | 317.3 | 332.5 | 345.8 | 361.6 | 393.7 |
| 3567 | | 303.6 | 315.3 | 329.6 | 342.1 | 371.5 |
| 3568 | | 317.1 | 329.0 | 345.5 | 362.3 | 385.2 |
| 3569 | | 313.3 | 327.8 | 343.7 | 354.6 | 381.1 |
| 3570 | | 347.9 | 360.7 | 380.7 | 397.3 | 424.7 |
| 3571 | | 320.7 | 330.2 | 345.1 | 360.5 | 394.5 |
| 3572 | | 306.7 | 320.7 | 332.4 | 341.8 | 366.3 |

| Females | Individual Gestation Body Weights (g) | Appendix C |
|---|---|---|

| Animal Number | Phase Day | GES 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | | |
| 4573 | | 292.4 | 306.6 | 320.9 | 332.8 | 364.6 |
| 4574 | | 302.8 | 312.6 | 324.7 | 339.1 | 364.0 |
| 4575 | | 332.6 | 345.2 | 359.1 | 382.5 | 412.0 |
| 4576 | | 287.4 | 297.0 | 315.1 | 329.0 | 349.0 |
| 4577 | | 298.2 | 309.8 | 324.1 | 336.3 | 366.4 |
| 4578 | | 323.6 | 338.5 | 356.3 | 370.5 | 392.8 |
| 4579 | | 307.9 | 319.4 | 329.1 | 342.3 | 365.4 |
| 4580 | | 343.6 | 355.2 | 376.5 | 386.4 | 409.2 |
| 4581 | | 342.9 | 351.2 | 368.6 | 381.1 | 415.1 |
| 4582 | | 271.3 | 273.5 | 279.6 | 281.7 | 298.4 |
| 4583 | | 258.0 | 257.1 | 260.6 | 266.8 | 279.8 |
| 4584 | | 308.5 | 325.5 | 341.9 | 355.2 | 388.4 |
| 4585 | | 312.1 | 324.0 | 333.0 | 348.7 | 377.6 |
| 4586 | | 320.9 | 335.8 | 348.0 | 359.6 | 389.6 |
| 4587 | | 331.8 | 346.3 | 362.6 | 379.7 | 408.0 |
| 4588 | | 335.1 | 346.0 | 363.5 | 378.5 | 400.7 |
| 4589 | | 330.3 | 343.6 | 360.3 | 371.9 | 397.4 |
| 4590 | | 320.4 | 335.6 | 348.6 | 361.0 | 384.4 |
| 4591 | | 321.1 | 335.4 | 352.4 | 368.2 | 396.2 |
| 4592 np | | 266.0x | 275.6x | 283.6x | 284.0x | 287.8x |
| 4593 | | 268.7 | 278.6 | 287.5 | 300.7 | 325.1 |
| 4594 | | 379.4 | 391.7 | 407.8 | 422.4 | 457.1 |
| 4595 | | 311.6 | 325.8 | 338.8 | 349.7 | 373.1 |
| 4596 | | 314.0 | 333.8 | 339.1 | 349.2 | 370.9 |

np = not pregnant, x = excluded from calculation, GES = gestation

| Females | Individual Gestation Body Weight Changes (g) | Appendix D |
|---|---|---|

| Animal Number | Phase Day | GES 4-5 | 5-6 | 6-9 | 9-12 | 12-15 | 15-18 | 18-19 | 19-20 | 5-19 | 5-20 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | | | | | | |
| 1501 | | -2.4 | 3.7 | 10.0 | 25.2 | 19.7 | 41.4 | 9.3 | 33.0 | 109.3 | 142.3 |
| 1502 | | -11.6 | 4.2 | 2.6 | 16.3 | 13.5 | 31.1 | 14.8 | 18.0 | 82.5 | 100.5 |
| 1503 | | -10.7 | 4.8 | 6.9 | 15.2 | 16.9 | 26.9 | 12.8 | 24.3 | 83.5 | 107.8 |
| 1504 | | -15.6 | 4.2 | 9.9 | 15.5 | 16.5 | 39.6 | 11.8 | 27.7 | 97.5 | 125.2 |
| 1505 | | -7.8 | 4.6 | 14.4 | 19.9 | 23.7 | 37.7 | 18.2 | 18.3 | 118.5 | 136.8 |
| 1506 | | -7.3 | 3.9 | 8.2 | 16.3 | 14.4 | 45.3 | 10.4 | 19.7 | 98.5 | 118.2 |
| 1507 | | -12.6 | 6.7 | 10.7 | 13.8 | 23.0 | 52.1 | 12.6 | 26.7 | 118.9 | 145.6 |
| 1508 | | -11.4 | 6.3 | 12.4 | 22.5 | 14.9 | 41.9 | 11.2 | 24.0 | 109.2 | 133.2 |
| 1509 | | -6.0 | 10.7 | 10.8 | 23.3 | 11.7 | 40.9 | 12.5 | 29.0 | 109.9 | 138.9 |
| 1510 | | -8.4 | -0.4 | 19.9 | 18.3 | 16.7 | 33.4 | 14.7 | 17.5 | 102.6 | 120.1 |
| 1511 | | -9.6 | 7.0 | 8.3 | 22.9 | 13.4 | 38.0 | 12.7 | 31.2 | 102.3 | 133.5 |
| 1512 | | -23.7 | 9.6 | 15.4 | 16.2 | 14.7 | 38.7 | 11.8 | 22.8 | 106.4 | 129.2 |
| 1513 | | -8.5 | 10.0 | 13.1 | 17.1 | 19.2 | 30.4 | 14.3 | 28.8 | 104.1 | 132.9 |
| 1514 | | 6.1 | 5.6 | 8.6 | 13.8 | 17.0 | 29.6 | 9.0 | 27.4 | 83.6 | 111.0 |
| 1515 | | -3.9 | -0.6 | 10.9 | 26.0 | 16.9 | 36.5 | 14.8 | 21.1 | 104.5 | 125.6 |
| 1516 | | -3.6 | 7.8 | 12.0 | 17.2 | 23.1 | 41.9 | 10.8 | 29.5 | 112.8 | 142.3 |
| 1517 | | -5.1 | 0.4 | 10.9 | 16.1 | 12.1 | 38.0 | 9.9 | 33.9 | 87.4 | 121.3 |
| 1518 | | -0.2 | 2.8 | 11.2 | 15.8 | 17.2 | 36.9 | 18.4 | 25.4 | 102.3 | 127.7 |
| 1519 | | 3.2 | 8.7 | 18.8 | 22.5 | 29.3 | 40.2 | 18.0 | 18.0 | 137.5 | 155.5 |
| 1520 | | 4.1 | 0.5 | 12.8 | 14.8 | 18.2 | 32.6 | 11.9 | 24.4 | 90.8 | 115.2 |
| 1521 np | | -6.2x | -0.7x | 17.5x | 8.3x | 2.1x | 1.9x | 2.9x | 10.6x | 32.0x | 42.6x |
| 1522 | | 0.6 | -0.8 | 13.6 | 14.4 | 13.0 | 28.4 | 12.5 | 24.6 | 81.1 | 105.7 |
| 1523 | | -1.4 | -2.3 | 15.7 | 10.9 | 16.0 | 31.9 | 13.7 | 12.5 | 85.9 | 98.4 |
| 1524 | | 7.5 | 3.9 | 12.5 | 13.1 | 18.8 | 30.6 | 17.7 | 22.5 | 96.6 | 119.1 |

np = not pregnant, x = excluded from calculation, GES = gestation

| Females | Individual Gestation Body Weight Changes (g) | Appendix D |
|---|---|---|

| Animal Number | Phase Day | GES 4-5 | 5-6 | 6-9 | 9-12 | 12-15 | 15-18 | 18-19 | 19-20 | 5-19 | 5-20 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | | | | | | |
| 2525 | | -4.0 | 3.5 | 13.4 | 18.8 | 15.1 | 35.0 | 2.5 | 7.5 | 102.5 | 123.2 |
| 2526 | | -7.8 | 2.4 | 11.3 | 15.6 | 22.8 | 35.5 | 5.8 | 4.0 | 101.9 | 132.8 |
| 2527 | | -11.0 | 8.3 | 13.9 | 17.5 | 23.1 | 42.0 | 10.3 | 3.7 | 121.7 | 145.7 |
| 2528 | | -6.2 | 4.5 | 14.3 | 22.6 | 23.1 | 43.7 | 8.3 | 9.6 | 120.1 | 137.7 |
| 2529 | | -5.3 | 3.4 | 8.2 | 19.4 | 18.6 | 39.3 | 11.8 | 2.7 | 101.6 | 125.2 |
| 2530 | | -6.7 | 2.0 | 17.7 | 21.1 | 17.0 | 44.3 | 7.4 | 8.7 | 116.3 | 140.5 |
| 2531 | | -7.2 | -2.5 | 18.2 | 14.4 | 26.6 | 35.4 | 9.0 | 3.9 | 104.6 | 139.2 |
| 2532 | | -11.6 | -3.1 | 17.1 | 17.2 | 26.2 | 41.1 | 10.3 | 3.4 | 113.8 | 138.6 |
| 2533 | | -11.0 | -1.2 | 20.8 | 24.4 | 29.5 | 35.6 | 8.9 | 8.6 | 124.6 | 161.9 |
| 2534 | | -11.1 | -2.6 | 15.0 | 18.6 | 12.1 | 23.7 | 4.4 | 2.7 | 68.0 | 92.6 |
| 2535 | | -11.2 | 4.4 | 9.1 | 14.3 | 21.0 | 31.0 | 6.1 | 1.6 | 97.0 | 122.6 |
| 2536 | | -12.0 | 2.6 | 16.7 | 24.5 | 23.5 | 39.9 | 9.7 | 6.0 | 114.0 | 144.2 |
| 2537 | | -7.5 | 6.0 | 15.3 | 16.6 | 12.9 | 27.5 | 5.5 | 6.8 | 80.5 | 112.6 |
| 2538 | | 1.0 | 3.6 | 16.9 | 14.4 | 12.7 | 35.2 | 6.8 | 2.1 | 100.1 | 124.0 |
| 2539 | | 2.2 | 5.0 | 13.1 | 24.2 | 15.5 | 42.1 | 11.2 | 6.6 | 106.7 | 129.2 |
| 2540 | | -6.0 | 10.8 | 15.4 | 12.7 | 19.9 | 34.8 | 5.9 | 3.0 | 103.7 | 129.8 |
| 2541 | | -4.1 | 5.1 | 14.6 | 20.0 | 10.5 | 30.8 | 8.9 | 6.6 | 84.6 | 113.2 |
| 2542 | | -3.2 | 4.9 | 18.7 | 20.9 | 20.8 | 34.2 | 9.0 | 7.2 | 114.3 | 141.3 |
| 2543 | | 1.7 | 4.8 | 11.3 | 17.0 | 19.1 | 37.6 | 6.6 | 1.6 | 109.9 | 129.8 |
| 2544 | | 5.1 | 6.6 | 19.1 | 28.0 | 22.9 | 34.2 | 13.5 | 5.0 | 130.2 | 155.9 |
| 2545 | | 4.8 | 4.8 | 23.0 | 19.5 | 27.2 | 35.2 | 13.1 | 0.1 | 129.4 | 154.8 |
| 2546 | | -4.1 | 8.6 | 8.9 | 14.4 | 16.0 | 31.5 | 10.0 | -0.7 | 96.2 | 122.7 |
| 2547 | | 2.3 | 1.7 | 9.6 | 11.4 | 7.4 | 5.3 | 8.6 | -0.7 | 40.5 | 59.5 |
| 2548 | | -0.9 | 4.8 | 20.5 | 19.6 | 13.5 | 32.9 | 7.8 | 5.4 | 104.2 | 130.9 |

GES = gestation

| Females | Individual Gestation Body Weight Changes (g) | Appendix D |
|---|---|---|

| Animal Number | Phase Day | GES 4-5 | 5-6 | 6-9 | 9-12 | 12-15 | 15-18 | 18-19 | 19-20 | 5-19 | 5-20 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | | | | | | |
| 3549 | | 2.7 | -11.3 | 5.5 | 21.1 | 23.2 | 42.6 | 18.1 | 25.6 | 99.2 | 124.8 |
| 3550 | | 5.5 | -11.5 | 12.3 | 14.3 | 18.2 | 37.5 | 17.7 | 26.1 | 88.5 | 114.6 |
| 3551 | | 4.8 | -8.5 | 7.8 | 15.0 | 15.8 | 29.6 | 14.4 | 26.4 | 74.1 | 100.5 |
| 3552 | | 6.3 | -10.4 | 1.8 | 17.3 | 14.0 | 32.0 | 8.2 | 24.4 | 62.9 | 87.3 |
| 3553 | | 4.7 | -14.1 | 10.1 | 29.8 | 24.3 | 41.3 | 13.1 | 27.1 | 104.5 | 131.6 |
| 3554 | | 4.8 | -12.4 | 15.9 | 23.2 | 13.7 | 46.7 | 15.5 | 5.4 | 102.6 | 108.0 |
| 3555 | | -7.9 | 3.9 | 14.0 | 23.4 | 20.7 | 29.9 | 13.3 | 19.2 | 105.2 | 124.4 |
| 3556 | | -14.0 | 4.6 | 8.1 | 29.1 | 27.1 | 35.4 | 17.4 | 33.9 | 121.7 | 155.6 |
| 3557 | | -7.5 | 5.0 | 16.9 | 14.2 | 15.1 | 53.6 | 20.5 | 28.1 | 125.3 | 153.4 |
| 3558 | | -14.8 | -0.7 | 14.6 | 21.9 | 13.1 | 41.6 | 12.7 | 24.6 | 103.2 | 127.8 |
| 3559 | | -11.1 | 1.3 | 12.9 | 29.0 | 8.7 | 34.8 | 12.9 | 25.6 | 99.6 | 125.2 |
| 3560 | | -9.3 | 1.7 | 12.0 | 20.7 | 23.7 | 40.4 | 19.0 | 26.6 | 117.5 | 144.1 |
| 3561 | | -3.5 | -0.9 | 7.8 | 15.8 | 16.5 | 37.7 | 10.4 | 24.6 | 87.3 | 111.9 |
| 3562 | | 0.0 | 11.1 | 4.2 | 20.7 | 18.8 | 31.8 | 14.5 | 21.4 | 101.1 | 122.5 |
| 3563 | | 0.5 | 5.9 | 14.7 | 20.5 | 22.2 | 41.8 | 8.1 | 28.5 | 113.2 | 141.7 |
| 3564 | | -7.0 | 4.0 | 14.0 | 11.5 | 18.8 | 40.1 | 13.3 | 27.1 | 101.7 | 128.8 |
| 3565 | | -6.6 | 7.8 | 10.5 | 16.2 | 11.8 | 35.6 | 9.8 | 28.1 | 91.7 | 119.8 |
| 3566 | | 2.0 | 10.9 | 11.5 | 15.0 | 12.0 | 37.4 | 15.8 | 32.1 | 102.6 | 134.7 |
| 3567 | | 4.0 | 2.5 | 19.5 | 27.5 | 18.3 | 37.8 | 12.5 | 29.4 | 118.1 | 147.5 |
| 3568 | | 2.1 | 0.6 | 19.2 | 26.2 | 27.0 | 38.0 | 16.8 | 22.9 | 127.8 | 150.7 |
| 3569 | | 2.2 | 1.0 | 23.4 | 26.7 | 26.4 | 41.8 | 10.9 | 26.5 | 130.2 | 156.7 |
| 3570 | | 4.8 | 0.0 | 20.5 | 19.0 | 23.4 | 44.9 | 16.6 | 27.4 | 124.4 | 151.8 |
| 3571 | | -3.2 | 5.7 | 23.6 | 15.4 | 19.5 | 37.0 | 15.4 | 34.0 | 116.6 | 150.6 |
| 3572 | | 6.3 | -5.9 | 9.8 | 16.3 | 20.3 | 32.7 | 9.4 | 24.5 | 82.6 | 107.1 |

GES = gestation

| Females | Individual Gestation Body Weight Changes (g) | Appendix D |
|---|---|---|

| Animal Number | Phase Day | GES 4-5 | 5-6 | 6-9 | 9-12 | 12-15 | 15-18 | 18-19 | 19-20 | 5-19 | 5-20 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | | | | | | | |
| 4573 | | 6.0 | -7.7 | 6.3 | 23.2 | 13.2 | 40.3 | 11.9 | 31.8 | 87.2 | 119.0 |
| 4574 | | 8.2 | -13.6 | 8.3 | 14.6 | 16.7 | 30.0 | 14.4 | 24.9 | 70.4 | 95.3 |
| 4575 | | 7.8 | -14.5 | 18.6 | 18.0 | 18.8 | 37.2 | 23.4 | 29.5 | 101.5 | 131.0 |
| 4576 | | -8.6 | 4.4 | 11.9 | 21.8 | 17.8 | 35.9 | 13.9 | 20.0 | 105.7 | 125.7 |
| 4577 | | -7.0 | 4.0 | 11.3 | 17.7 | 17.2 | 33.4 | 12.2 | 30.1 | 95.8 | 125.9 |
| 4578 | | -7.9 | 1.9 | 4.1 | 22.9 | 18.0 | 39.7 | 14.2 | 22.3 | 100.8 | 123.1 |
| 4579 | | -10.3 | 0.6 | 18.6 | 18.4 | 18.1 | 32.1 | 13.2 | 23.1 | 101.0 | 124.1 |
| 4580 | | -15.4 | 4.8 | 14.3 | 21.9 | 27.5 | 37.7 | 9.9 | 22.8 | 116.1 | 138.9 |
| 4581 | | -3.4 | -1.0 | 17.5 | 16.3 | 17.3 | 35.5 | 12.5 | 34.0 | 98.1 | 132.1 |
| 4582 | | -14.0 | -1.2 | 10.3 | 14.5 | 6.6 | 11.0 | 2.1 | 16.7 | 43.3 | 60.0 |
| 4583 | | -7.9 | -1.5 | 12.7 | 10.0 | 13.6 | 8.8 | 6.2 | 13.0 | 49.8 | 62.8 |
| 4584 | | -1.4 | 1.5 | 13.3 | 21.9 | 22.2 | 39.9 | 13.3 | 33.2 | 112.1 | 145.3 |
| 4585 | | -3.8 | 6.5 | 10.7 | 22.9 | 19.3 | 29.6 | 15.7 | 28.9 | 104.7 | 133.6 |
| 4586 | | 0.8 | 4.7 | 12.4 | 16.3 | -3.0 | 57.1 | 11.6 | 30.0 | 99.1 | 129.1 |
| 4587 | | -2.4 | 6.2 | 15.7 | 16.1 | 19.1 | 44.9 | 17.1 | 28.3 | 119.1 | 147.4 |
| 4588 | | -0.8 | 7.0 | 12.1 | 19.2 | 15.1 | 41.6 | 15.0 | 22.2 | 110.0 | 132.2 |
| 4589 | | -5.8 | 8.0 | 15.0 | 23.2 | 18.4 | 42.4 | 11.6 | 25.5 | 118.6 | 144.1 |
| 4590 | | -2.8 | 9.3 | 11.0 | 17.0 | 10.2 | 35.3 | 12.4 | 23.4 | 95.2 | 118.6 |
| 4591 | | 0.8 | 3.2 | 20.6 | 23.2 | 20.7 | 43.3 | 15.8 | 28.0 | 126.8 | 154.8 |
| 4592 np | | 6.2x | 3.4x | 12.0x | 6.8x | 17.8x | 12.8x | 0.4x | 3.8x | 53.2x | 57.0x |
| 4593 | | 2.0 | 6.1 | 9.1 | 20.8 | 22.0 | 26.7 | 13.2 | 24.4 | 97.9 | 122.3 |
| 4594 | | 1.9 | 4.6 | 20.9 | 21.8 | 29.6 | 35.5 | 14.6 | 34.7 | 127.0 | 161.7 |
| 4595 | | 0.6 | 6.9 | 13.2 | 14.6 | 20.2 | 33.4 | 10.9 | 23.4 | 99.2 | 122.6 |
| 4596 | | 0.5 | 4.1 | 12.6 | 15.7 | 12.4 | 34.8 | 10.1 | 21.7 | 89.7 | 111.4 |

np = not pregnant, x = excluded from calculation, GES = gestation

| Females | Individual Gestation Food Consumption Values (g/animal/day) | Appendix E |
|---|---|---|

| Animal Number | Phase Day | GES 4-5 | 5-6 | 6-9 | 9-12 | 12-15 | 15-18 | 18-19 | 19-20 | 5-19 | 5-20 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | | | | | | |
| 1501 | | 25.5 | 26.1 | 25.2 | 27.6 | 27.5 | 27.8 | 27.2 | 26.2 | 27.0 | 26.9 |
| 1502 | | 18.0 | 21.6 | 18.8 | 21.1 | 21.8 | 23.4 | 25.0 | 17.4 | 21.6 | 21.3 |
| 1503 | | 20.4 | 23.9 | 20.7 | 22.9 | 20.9 | 22.2 | 23.3 | 21.3 | 21.9 | 21.9 |
| 1504 | | 21.4 | 23.7 | 20.6 | 20.9 | 20.0 | 23.9 | 19.8 | 20.2 | 21.4 | 21.3 |
| 1505 | | 19.7 | 20.1 | 20.7 | 21.5 | 20.7 | 22.7 | 25.5 | 21.0 | 21.6 | 21.6 |
| 1506 | | 21.2 | 22.5 | 20.1 | 22.0 | 22.1 | 24.1 | 22.4 | 22.7 | 22.1 | 22.2 |
| 1507 | | 25.7 | 26.9 | 24.6 | 25.9 | 26.0 | 28.9 | 26.6 | 22.6 | 26.4 | 26.2 |
| 1508 | | 22.4 | 22.3 | 22.3 | 24.1 | 23.4 | 23.5 | 22.9 | 22.2 | 23.2 | 23.2 |
| 1509 | | 24.4 | 23.3 | 22.9 | 24.4 | 24.8 | 27.1 | 27.8 | 28.9 | 24.9 | 25.2 |
| 1510 | | 18.8 | 18.3 | 20.2 | 20.5 | 22.9 | 22.6 | 22.9 | 19.9 | 21.4 | 21.3 |
| 1511 | | 23.2 | 21.7 | 22.2 | 22.6 | 22.7 | 24.3 | 27.1 | 24.7 | 23.2 | 23.3 |
| 1512 | | 22.5 | 16.6 | 20.4 | 22.0 | 20.7 | 23.8 | 23.7 | 21.1 | 21.5 | 21.5 |
| 1513 | | 24.1 | 24.3 | 24.5 | 24.1 | 24.6 | 25.9 | 25.3 | 22.8 | 24.8 | 24.6 |
| 1514 | | 19.8 | 20.7 | 20.7 | 20.9 | 21.6 | 26.1 | 22.9 | 25.1 | 22.2 | 22.4 |
| 1515 | | 18.3 | 20.5 | 19.2 | 21.6 | 23.5 | 25.7 | 25.4 | 21.0 | 22.6 | 22.4 |
| 1516 | | 17.9 | 24.4 | 21.8 | 21.9 | 23.0 | 24.6 | 26.4 | 23.7 | 23.2 | 23.2 |
| 1517 | | 22.0 | 20.9 | 21.6 | 21.2 | 20.5 | 17.3 | 22.0 | 23.1 | 20.3 | 20.5 |
| 1518 | | 23.6 | 24.3 | 22.8 | 23.2 | 23.5 | 26.8 | 25.2 | 24.6 | 24.2 | 24.2 |
| 1519 | | 23.2 | 25.1 | 23.7 | 24.9 | 26.5 | 27.7 | 28.1 | 21.4 | 25.8 | 25.5 |
| 1520 | | 23.3 | 19.7 | 21.4 | 20.9 | 22.2 | 23.7 | 23.2 | 23.9 | 22.0 | 22.1 |
| 1521 np | | 20.9x | 24.4x | 23.5x | 21.2x | 17.9x | 17.3x | 16.6x | 18.7x | 20.1x | 20.0x |
| 1522 | | 19.2 | 21.6 | 22.5 | 20.7 | 22.6 | 23.8 | 24.5 | 21.1 | 22.5 | 22.4 |
| 1523 | | 16.7 | 16.2 | 18.8 | 17.9 | 19.3 | 19.9 | 20.6 | 17.2 | 18.9 | 18.8 |
| 1524 | | 25.5 | 25.5 | 23.6 | 23.5 | 23.6 | 24.9 | 25.0 | 20.6 | 24.1 | 23.9 |

np = not pregnant, x = excluded from calculation, GES = gestation

| Females | Individual Gestation Food Consumption Values (g/animal/day) | Appendix E |
|---|---|---|

| Animal Number | Phase Day | GES 4-5 | 5-6 | 6-9 | 9-12 | 12-15 | 15-18 | 18-19 | 19-20 | 5-19 | 5-20 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | | | | | | |
| 2525 | | 28.0 | 25.8 | 24.1 | 27.5 | 23.9 | 28.3 | 27.6 | 23.1 | 26.1 | 25.9 |
| 2526 | | 25.5 | 22.8 | 21.9 | 22.2 | 24.0 | 26.9 | 25.6 | 21.3 | 23.8 | 23.6 |
| 2527 | | 20.6 | 24.7 | 22.3 | 22.7 | 23.5 | 28.2 | 23.4 | 25.4 | 24.2 | 24.2 |
| 2528 | | 23.3 | 22.8 | 22.3 | 24.8 | 24.2 | 27.6 | 27.5 | 17.0 | 24.8 | 24.3 |
| 2529 | | 22.2 | 23.7 | 18.9 | 22.0 | 21.9 | 23.7 | 24.0 | 20.1 | 22.0 | 21.8 |
| 2530 | | 25.7 | 23.5 | 23.0 | 24.4 | 25.1 | 29.1 | 26.4 | 21.0 | 25.4 | 25.1 |
| 2531 | | 24.3 | 21.9 | 24.9 | 25.0 | 26.8 | 29.6 | 26.2 | 24.0 | 26.2 | 26.1 |
| 2532 | | 27.5 | 22.6 | 27.5 | 29.9 | 28.8 | 19.1 | 30.0 | 24.8 | 26.3 | 26.2 |
| 2533 | | 24.5 | 21.9 | 24.9 | 25.6 | 28.4 | 28.1 | 29.8 | 24.9 | 26.6 | 26.5 |
| 2534 | | 23.5 | 18.7 | 21.9 | 22.2 | 23.0 | 24.9 | 21.0 | 24.1 | 22.5 | 22.6 |
| 2535 | | 19.5 | 21.1 | 19.9 | 20.7 | 21.8 | 21.4 | 21.7 | 21.8 | 21.0 | 21.1 |
| 2536 | | 26.5 | 21.3 | 24.5 | 26.8 | 28.5 | 20.6 | 32.7 | 26.4 | 25.4 | 25.4 |
| 2537 | | 15.3 | 22.2 | 19.1 | 22.1 | 21.7 | 21.7 | 23.8 | 22.1 | 21.4 | 21.5 |
| 2538 | | 21.5 | 22.5 | 21.1 | 22.1 | 19.8 | 20.7 | 24.1 | 20.5 | 21.3 | 21.2 |
| 2539 | | 20.3 | 25.6 | 23.4 | 25.4 | 25.2 | 25.9 | 28.5 | 25.6 | 25.3 | 25.3 |
| 2540 | | 25.0 | 28.8 | 25.5 | 24.4 | 25.2 | 26.2 | 24.1 | 20.9 | 25.5 | 25.2 |
| 2541 | | 18.4 | 21.7 | 22.0 | 21.4 | 23.6 | 25.1 | 23.5 | 23.8 | 23.0 | 23.0 |
| 2542 | | 17.8 | 23.3 | 23.6 | 23.2 | 24.1 | 24.8 | 26.6 | 20.4 | 24.1 | 23.8 |
| 2543 | | 23.3 | 24.9 | 25.3 | 24.2 | 24.8 | 25.6 | 27.1 | 23.6 | 25.1 | 25.0 |
| 2544 | | 24.7 | 20.5 | 26.3 | 27.8 | 26.6 | 26.8 | 27.8 | 25.8 | 26.5 | 26.4 |
| 2545 | | 22.7 | 24.3 | 23.7 | 23.4 | 25.2 | 27.5 | 28.4 | 26.2 | 25.2 | 25.2 |
| 2546 | | 18.8 | 28.1 | 23.8 | 22.7 | 22.5 | 23.1 | 25.4 | 22.9 | 23.6 | 23.5 |
| 2547 | | 20.1 | 24.7 | 23.2 | 21.3 | 20.8 | 19.7 | 20.8 | 20.9 | 21.5 | 21.4 |
| 2548 | | 19.5 | 28.8 | 25.8 | 23.7 | 25.2 | 26.4 | 27.3 | 25.1 | 25.7 | 25.6 |

GES = gestation

| Females | Individual Gestation Food Consumption Values (g/animal/day) | Appendix E |
|---|---|---|

| Animal Number | Phase Day | GES 4-5 | 5-6 | 6-9 | 9-12 | 12-15 | 15-18 | 18-19 | 19-20 | 5-19 | 5-20 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | | | | | | |
| 3549 | | 22.7 | 21.3 | 20.6 | 23.8 | 25.6 | 28.3 | 28.7 | 21.3 | 24.7 | 24.4 |
| 3550 | | 21.7 | 22.2 | 21.1 | 21.8 | 22.0 | 24.6 | 25.4 | 21.3 | 22.6 | 22.5 |
| 3551 | | 24.6 | 23.6 | 23.3 | 24.5 | 24.4 | 26.1 | 27.1 | 21.4 | 24.7 | 24.5 |
| 3552 | | 18.7 | 17.6 | 15.8 | 19.2 | 19.7 | 22.2 | 20.2 | 18.5 | 19.2 | 19.1 |
| 3553 | | 21.0 | 25.3 | 20.8 | 25.4 | 25.5 | 28.9 | 27.3 | 18.6 | 25.3 | 24.9 |
| 3554 | | 23.2 | 22.8 | 23.5 | 25.5 | 21.4 | 24.5 | 23.8 | 9.4 | 23.7 | 22.7 |
| 3555 | | 22.0 | 20.8 | 21.2 | 25.2 | 24.2 | 25.4 | 25.7 | 21.0 | 23.9 | 23.7 |
| 3556 | | 18.7 | 19.6 | 21.9 | 24.9 | 25.6 | 26.7 | 26.0 | 29.1 | 24.5 | 24.8 |
| 3557 | | 26.3 | 22.3 | 24.6 | 22.8 | 24.5 | 28.4 | 27.0 | 26.8 | 25.0 | 25.1 |
| 3558 | | 21.2 | 19.6 | 21.5 | 23.1 | 24.2 | 24.0 | 24.5 | 17.5 | 23.0 | 22.7 |
| 3559 | | 22.6 | 20.7 | 22.8 | 23.1 | 23.1 | 25.7 | 26.6 | 25.2 | 23.7 | 23.8 |
| 3560 | | 24.6 | 22.5 | 24.3 | 24.3 | 25.3 | 26.8 | 28.4 | 22.9 | 25.2 | 25.1 |
| 3561 | | 18.9 | 18.6 | 17.4 | 20.4 | 22.0 | 25.3 | 21.2 | 20.4 | 21.1 | 21.0 |
| 3562 | | 26.9 | 25.2 | 25.1 | 23.7 | 26.5 | 27.8 | 26.0 | 26.5 | 25.7 | 25.8 |
| 3563 | | 29.1 | 27.6 | 27.5 | 29.1 | 28.2 | 28.4 | 29.0 | 26.0 | 28.3 | 28.2 |
| 3564 | | 17.4 | 20.5 | 21.6 | 19.9 | 21.7 | 24.0 | 25.0 | 22.1 | 21.9 | 21.9 |
| 3565 | | 17.0 | 24.2 | 21.5 | 22.7 | 24.7 | 26.3 | 25.7 | 24.2 | 24.0 | 24.0 |
| 3566 | | 21.4 | 27.2 | 25.8 | 25.1 | 21.5 | 24.5 | 25.4 | 24.7 | 24.5 | 24.5 |
| 3567 | | 21.5 | 19.4 | 23.6 | 24.7 | 28.1 | 27.8 | 33.1 | 28.7 | 26.1 | 26.3 |
| 3568 | | 22.4 | 22.1 | 24.6 | 24.6 | 26.6 | 28.8 | 29.7 | 25.6 | 26.1 | 26.1 |
| 3569 | | 22.8 | 16.2 | 23.6 | 27.1 | 26.9 | 27.6 | 31.5 | 28.3 | 25.9 | 26.1 |
| 3570 | | 27.1 | 25.3 | 27.5 | 26.2 | 25.8 | 27.3 | 27.0 | 22.2 | 26.6 | 26.3 |
| 3571 | | 23.5 | 21.1 | 23.9 | 22.5 | 25.5 | 27.8 | 27.2 | 26.6 | 24.8 | 24.9 |
| 3572 | | 24.9 | 19.8 | 23.9 | 22.1 | 24.4 | 24.1 | 24.5 | 21.4 | 23.4 | 23.3 |

GES = gestation

| Females | Individual Gestation Food Consumption Values (g/animal/day) | Appendix E |
|---|---|---|

| Animal Number | Phase Day | GES 4-5 | 5-6 | 6-9 | 9-12 | 12-15 | 15-18 | 18-19 | 19-20 | 5-19 | 5-20 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | | | | | | | |
| 4573 | | 24.1 | 25.4 | 22.8 | 25.2 | 23.5 | 27.5 | 26.1 | 24.7 | 24.9 | 24.9 |
| 4574 | | 21.5 | 23.6 | 20.8 | 21.2 | 20.9 | 22.6 | 23.0 | 18.3 | 21.7 | 21.4 |
| 4575 | | 24.0 | 23.8 | 24.6 | 25.0 | 23.7 | 24.3 | 28.1 | 20.5 | 24.6 | 24.4 |
| 4576 | | 21.3 | 20.2 | 18.8 | 21.9 | 21.2 | 23.9 | 24.8 | 23.0 | 21.6 | 21.7 |
| 4577 | | 28.6 | 24.9 | 22.4 | 22.9 | 22.9 | 24.4 | 22.0 | 21.7 | 23.2 | 23.1 |
| 4578 | | 22.9 | 27.5 | 22.5 | 25.1 | 22.5 | 26.3 | 27.7 | 22.2 | 24.6 | 24.4 |
| 4579 | | 26.9 | 20.9 | 26.1 | 26.2 | 24.9 | 25.5 | 26.3 | 24.6 | 25.4 | 25.3 |
| 4580 | | 20.9 | 18.2 | 23.2 | 22.7 | 24.7 | 26.0 | 23.5 | 24.5 | 23.7 | 23.7 |
| 4581 | | 27.0 | 25.9 | 26.0 | 24.9 | 26.8 | 28.2 | 30.4 | 27.8 | 26.7 | 26.8 |
| 4582 | | 24.0 | 19.2 | 20.8 | 21.0 | 20.3 | 19.4 | 17.3 | 20.4 | 20.1 | 20.1 |
| 4583 | | 20.9 | 16.2 | 19.5 | 18.6 | 19.1 | 26.9 | 18.7 | 19.0 | 20.5 | 20.4 |
| 4584 | | 24.3 | 20.8 | 22.5 | 22.6 | 24.3 | 25.6 | 27.0 | 27.0 | 23.8 | 24.0 |
| 4585 | | 17.5 | 22.3 | 21.1 | 21.5 | 23.1 | 24.1 | 22.9 | 22.9 | 22.5 | 22.5 |
| 4586 | | 20.2 | 19.7 | 20.3 | 21.6 | 19.1 | 24.2 | 25.9 | 24.0 | 21.5 | 21.7 |
| 4587 | | 23.4 | 26.9 | 23.8 | 23.2 | 23.5 | 27.9 | 19.3 | 38.6 | 24.4 | 25.3 |
| 4588 | | 24.9 | 20.3 | 24.3 | 23.5 | 22.7 | 24.4 | 26.9 | 20.1 | 23.7 | 23.5 |
| 4589 | | 20.4 | 26.6 | 23.4 | 24.1 | 25.1 | 27.4 | 22.9 | 23.9 | 25.0 | 24.9 |
| 4590 | | 20.3 | 24.9 | 24.7 | 22.6 | 21.0 | 23.4 | 25.9 | 23.8 | 23.3 | 23.3 |
| 4591 | | 22.7 | 23.0 | 24.9 | 25.2 | 23.8 | 29.8 | 30.7 | 28.7 | 26.1 | 26.2 |
| 4592 np | | 23.3x | 23.3x | 23.2x | 22.0x | 25.7x | 23.0x | 22.8x | 18.5x | 23.4x | 23.1x |
| 4593 | | 18.9 | 17.8 | 17.8 | 18.1 | 21.8 | 21.0 | 22.1 | 22.5 | 19.7 | 19.9 |
| 4594 | | 27.8 | 26.1 | 26.3 | 26.9 | 31.8 | 32.9 | 34.5 | 30.0 | 29.6 | 29.6 |
| 4595 | | 20.7 | 22.5 | 24.7 | 23.3 | 23.5 | 22.3 | 21.6 | 16.8 | 23.2 | 22.8 |
| 4596 | | 26.2 | 23.9 | 24.1 | 23.0 | 25.3 | 26.9 | 27.8 | 22.9 | 25.0 | 24.8 |

np = not pregnant, x = excluded from calculation, GES = gestation

| Females | Raw Data Listing of Gross Observations with Modifiers (Maternal Observations) | Appendix F |
|---|---|---|

Huntingdon Life Sciences
Mettlers Road
P.O. Box 2360
Rat/CD IGS

Raw Data Listing of Gross Observations with Modifiers
Study number: 14-4418
Study start date: 27-May-15

Printed: 15-Sep-15
Page: 1
Segment II/Inhalation

| Animal number | Sex | Group/ Subgroup | Date and time data was entered | Date data taken | Opr # | Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels |
|---|---|---|---|---|---|---|
| 1501 | F | 1/1 | 16-Jun-15 09:40 | 16-Jun-15 | 46 | Within Normal Limits |
| 1502 | F | 1/1 | 16-Jun-15 09:56 | 16-Jun-15 | 222 | Within Normal Limits |
| 1503 | F | 1/1 | 16-Jun-15 10:31 | 16-Jun-15 | 461 | Within Normal Limits |
| 1504 | F | 1/1 | 16-Jun-15 10:51 | 16-Jun-15 | 427 | Within Normal Limits |
| 1505 | F | 1/1 | 16-Jun-15 11:06 | 16-Jun-15 | 470 | Within Normal Limits |
| 1506 | F | 1/1 | 16-Jun-15 11:36 | 16-Jun-15 | 470 | Within Normal Limits |
| 1507 | F | 1/2 | 17-Jun-15 09:38 | 17-Jun-15 | 470 | Within Normal Limits |
| 1508 | F | 1/2 | 17-Jun-15 09:32 | 17-Jun-15 | 470 | Within Normal Limits |
| 1509 | F | 1/2 | 17-Jun-15 09:59 | 17-Jun-15 | 470 | Within Normal Limits |
| 1510 | F | 1/2 | 17-Jun-15 10:41 | 17-Jun-15 | 470 | Within Normal Limits |
| 1511 | F | 1/2 | 17-Jun-15 11:25 | 17-Jun-15 | 470 | Within Normal Limits |
| 1512 | F | 1/2 | 17-Jun-15 12:03 | 17-Jun-15 | 470 | Within Normal Limits |
| 1513 | F | 1/3 | 18-Jun-15 09:33 | 18-Jun-15 | 471 | Within Normal Limits |
| 1514 | F | 1/3 | 18-Jun-15 09:19 | 18-Jun-15 | 471 | Within Normal Limits |
| 1515 | F | 1/3 | 18-Jun-15 10:05 | 18-Jun-15 | 427 | Within Normal Limits |
| 1516 | F | 1/3 | 18-Jun-15 10:50 | 18-Jun-15 | 471 | Within Normal Limits |

| Females | Raw Data Listing of Gross Observations with Modifiers (Maternal Observations) | Appendix F |
|---|---|---|

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Raw Data Listing of Gross Observations with Modifiers
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Segment II/Inhalation

| Animal number | Sex | Group/ Subgroup | Date and time data was entered | Date data taken | Opr # | Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels |
|---|---|---|---|---|---|---|
| 1517 | F | 1/3 | 18-Jun-15 11:07 | 18-Jun-15 | 471 | Within Normal Limits |
| 1518 | F | 1/3 | 18-Jun-15 11:14 | 18-Jun-15 | 471 | Within Normal Limits |
| 1519 | F | 1/4 | 19-Jun-15 09:46 | 19-Jun-15 | 470 | Within Normal Limits |
| 1520 | F | 1/4 | 19-Jun-15 09:32 | 19-Jun-15 | 470 | Within Normal Limits |
| 1521 | F | 1/4 | 19-Jun-15 09:53 | 19-Jun-15 | 200 | Within Normal Limits |
| 1522 | F | 1/4 | 19-Jun-15 10:15 | 19-Jun-15 | 470 | Within Normal Limits |

| Females | Raw Data Listing of Gross Observations with Modifiers (Maternal Observations) | Appendix F |
|---|---|---|

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Study number: 14-4418
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Segment II/Inhalation

| Animal number | Sex | Group/ Subgroup | Date and time data was entered | Date data taken | Opr # | Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels |
|---|---|---|---|---|---|---|
| 1523 | F | 1/4 | 19-Jun-15 10:45 | 19-Jun-15 | 470 | Within Normal Limits |
| 1524 | F | 1/4 | 19-Jun-15 10:56 | 19-Jun-15 | 470 | Within Normal Limits |
| 2525 | F | 2/1 | 16-Jun-15 10:02 | 16-Jun-15 | 250 | Within Normal Limits |
| 2526 | F | 2/1 | 16-Jun-15 09:44 | 16-Jun-15 | 395 | Within Normal Limits |
| 2527 | F | 2/1 | 16-Jun-15 10:23 | 16-Jun-15 | 46 | Within Normal Limits |
| 2528 | F | 2/1 | 16-Jun-15 10:45 | 16-Jun-15 | 470 | Within Normal Limits |
| 2529 | F | 2/1 | 16-Jun-15 11:11 | 16-Jun-15 | 470 | Within Normal Limits |
| 2530 | F | 2/1 | 16-Jun-15 12:09 | 16-Jun-15 | 470 | Within Normal Limits |
| 2531 | F | 2/2 | 17-Jun-15 09:27 | 17-Jun-15 | 470 | Within Normal Limits |
| 2532 | F | 2/2 | 17-Jun-15 09:53 | 17-Jun-15 | 470 | Within Normal Limits |
| 2533 | F | 2/2 | 17-Jun-15 10:14 | 17-Jun-15 | 470 | Within Normal Limits |
| 2534 | F | 2/2 | 17-Jun-15 10:51 | 17-Jun-15 | 470 | Within Normal Limits |
| 2535 | F | 2/2 | 17-Jun-15 11:30 | 17-Jun-15 | 470 | Within Normal Limits |
| 2536 | F | 2/2 | 17-Jun-15 12:23 | 17-Jun-15 | 470 | Within Normal Limits |
| 2537 | F | 2/3 | 18-Jun-15 09:25 | 18-Jun-15 | 471 | Within Normal Limits |
| 2538 | F | 2/3 | 18-Jun-15 10:12 | 18-Jun-15 | 46 | Within Normal Limits |

| Females | Raw Data Listing of Gross Observations with Modifiers (Maternal Observations) | Appendix F |
|---|---|---|

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Raw Data Listing of Gross Observations with Modifiers
Study number: 14-4418
Study start date: 27-May-15

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Segment II/Inhalation

| Animal number | Sex | Group/ Subgroup | Date and time data was entered | Date data taken | Opr # | Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels |
|---|---|---|---|---|---|---|
| 2539 | F | 2/3 | 18-Jun-15 10:07 | 18-Jun-15 | 427 | Within Normal Limits |
| 2540 | F | 2/3 | 18-Jun-15 10:46 | 18-Jun-15 | 250 | Within Normal Limits |
| 2541 | F | 2/3 | 18-Jun-15 11:04 | 18-Jun-15 | 471 | Within Normal Limits |
| 2542 | F | 2/3 | 18-Jun-15 11:38 | 18-Jun-15 | 471 | Within Normal Limits |
| 2543 | F | 2/4 | 19-Jun-15 09:42 | 19-Jun-15 | 470 | Within Normal Limits |
| 2544 | F | 2/4 | 19-Jun-15 09:52 | 19-Jun-15 | 470 | Within Normal Limits |

| Females | Raw Data Listing of Gross Observations with Modifiers (Maternal Observations) | Appendix F |
|---|---|---|

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Raw Data Listing of Gross Observations with Modifiers
Study number: 14-4418
Study start date: 27-May-15

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Segment II/Inhalation

| Animal number | Sex | Group/ Subgroup | Date and time data was entered | Date data taken | Opr # | Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels |
|---|---|---|---|---|---|---|
| 2545 | F | 2/4 | 19-Jun-15 10:11 | 19-Jun-15 | 470 | Within Normal Limits |
| 2546 | F | 2/4 | 19-Jun-15 10:26 | 19-Jun-15 | 470 | Within Normal Limits |
| 2547 | F | 2/4 | 19-Jun-15 10:37 | 19-Jun-15 | 470 | Within Normal Limits |
| 2548 | F | 2/4 | 19-Jun-15 11:23 | 19-Jun-15 | 470 | Within Normal Limits |
| 3549 | F | 3/1 | 16-Jun-15 09:55 | 16-Jun-15 | 461 | Within Normal Limits |
| 3550 | F | 3/1 | 16-Jun-15 10:16 | 16-Jun-15 | 427 | Within Normal Limits |
| 3551 | F | 3/1 | 16-Jun-15 10:41 | 16-Jun-15 | 222 | Within Normal Limits |
| 3552 | F | 3/1 | 16-Jun-15 10:53 | 16-Jun-15 | 470 | Within Normal Limits |
| 3553 | F | 3/1 | 16-Jun-15 11:27 | 16-Jun-15 | 470 | Within Normal Limits |
| 3554 | F | 3/1 | 16-Jun-15 12:18 | 16-Jun-15 | 470 | Within Normal Limits |
| 3555 | F | 3/2 | 17-Jun-15 09:17 | 17-Jun-15 | 471 | Within Normal Limits |
| 3556 | F | 3/2 | 17-Jun-15 09:46 | 17-Jun-15 | 470 | Within Normal Limits |
| 3557 | F | 3/2 | 17-Jun-15 10:47 | 17-Jun-15 | 470 | Within Normal Limits |
| 3558 | F | 3/2 | 17-Jun-15 11:18 | 17-Jun-15 | 470 | Within Normal Limits |
| 3559 | F | 3/2 | 17-Jun-15 11:44 | 17-Jun-15 | 470 | Within Normal Limits |
| 3560 | F | 3/2 | 17-Jun-15 12:27 | 17-Jun-15 | 470 | Within Normal Limits |

| Females | Raw Data Listing of Gross Observations with Modifiers (Maternal Observations) | Appendix F |
|---|---|---|

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Raw Data Listing of Gross Observations with Modifiers
Study number: 14-4418
Study start date: 27-May-15

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Segment II/Inhalation

| Animal number | Sex | Group/ Subgroup | Date and time data was entered | Date data taken | Opr # | Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels |
|---|---|---|---|---|---|---|
| 3561 | F | 3/3 | 18-Jun-15 10:06 | 18-Jun-15 | 427 | Within Normal Limits |
| 3562 | F | 3/3 | 18-Jun-15 10:12 | 18-Jun-15 | 250 | Within Normal Limits |
| 3563 | F | 3/3 | 18-Jun-15 10:09 | 18-Jun-15 | 200 | Within Normal Limits |
| 3564 | F | 3/3 | 18-Jun-15 10:42 | 18-Jun-15 | 427 | Within Normal Limits |
| 3565 | F | 3/3 | 18-Jun-15 10:57 | 18-Jun-15 | 471 | Within Normal Limits |
| 3566 | F | 3/3 | 18-Jun-15 11:41 | 18-Jun-15 | 471 | Within Normal Limits |

| Females | Raw Data Listing of Gross Observations with Modifiers (Maternal Observations) | Appendix F |
|---|---|---|

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Segment II/Inhalation

| Animal number | Sex | Group/ Subgroup | Date and time data was entered | Date data taken | Opr # | Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels |
|---|---|---|---|---|---|---|
| 3567 | F | 3/4 | 19-Jun-15 09:27 | 19-Jun-15 | 470 | Within Normal Limits |
| 3568 | F | 3/4 | 19-Jun-15 09:57 | 19-Jun-15 | 470 | Within Normal Limits |
| 3569 | F | 3/4 | 19-Jun-15 10:07 | 19-Jun-15 | 470 | Within Normal Limits |
| 3570 | F | 3/4 | 19-Jun-15 10:42 | 19-Jun-15 | 470 | Within Normal Limits |
| 3571 | F | 3/4 | 19-Jun-15 10:51 | 19-Jun-15 | 470 | Within Normal Limits |
| 3572 | F | 3/4 | 19-Jun-15 11:28 | 19-Jun-15 | 470 | Within Normal Limits |
| 4573 | F | 4/1 | 16-Jun-15 09:44 | 16-Jun-15 | 427 | Within Normal Limits |
| 4574 | F | 4/1 | 16-Jun-15 10:22 | 16-Jun-15 | 395 | Within Normal Limits |
| 4575 | F | 4/1 | 16-Jun-15 10:42 | 16-Jun-15 | 471 | Within Normal Limits |
| 4576 | F | 4/1 | 16-Jun-15 11:00 | 16-Jun-15 | 470 | Within Normal Limits |
| 4577 | F | 4/1 | 16-Jun-15 11:42 | 16-Jun-15 | 470 | Within Normal Limits |
| 4578 | F | 4/1 | 16-Jun-15 12:13 | 16-Jun-15 | 470 | Within Normal Limits |
| 4579 | F | 4/2 | 17-Jun-15 09:18 | 17-Jun-15 | 470 | Within Normal Limits |
| 4580 | F | 4/2 | 17-Jun-15 10:03 | 17-Jun-15 | 470 | Within Normal Limits |
| 4581 | F | 4/2 | 17-Jun-15 10:35 | 17-Jun-15 | 470 | Within Normal Limits |
| 4582 | F | 4/2 | 17-Jun-15 11:14 | 17-Jun-15 | 470 | Within Normal Limits |

| Females | Raw Data Listing of Gross Observations with Modifiers (Maternal Observations) | Appendix F |
|---|---|---|

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Raw Data Listing of Gross Observations with Modifiers
Study number: 14-4418
Study start date: 27-May-15

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Segment II/Inhalation

| Animal number | Sex | Group/ Subgroup | Date and time data was entered | Date data taken | Opr # | Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels |
|---|---|---|---|---|---|---|
| 4583 | F | 4/2 | 17-Jun-15 12:19 | 17-Jun-15 | 470 | Within Normal Limits |
| 4584 | F | 4/2 | 17-Jun-15 12:58 | 17-Jun-15 | 427 | Within Normal Limits |
| 4585 | F | 4/3 | 18-Jun-15 09:29 | 18-Jun-15 | 471 | Within Normal Limits |
| 4586 | F | 4/3 | 18-Jun-15 10:18 | 18-Jun-15 | 461 | Within Normal Limits |
| 4587 | F | 4/3 | 18-Jun-15 10:39 | 18-Jun-15 | 427 | Within Normal Limits |
| 4588 | F | 4/3 | 18-Jun-15 10:53 | 18-Jun-15 | 46 | Within Normal Limits |

| Females | Raw Data Listing of Gross Observations with Modifiers (Maternal Observations) | Appendix F |
|---|---|---|

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Raw Data Listing of Gross Observations with Modifiers
Study number: 14-4418
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Segment II/Inhalation

| Animal number | Sex | Group/ Subgroup | Date and time data was entered | Date data taken | Opr # | Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels |
|---|---|---|---|---|---|---|
| 4589 | F | 4/3 | 18-Jun-15 11:00 | 18-Jun-15 | 471 | Within Normal Limits |
| 4590 | F | 4/3 | 18-Jun-15 11:34 | 18-Jun-15 | 471 | Within Normal Limits |
| 4591 | F | 4/4 | 19-Jun-15 09:37 | 19-Jun-15 | 470 | Within Normal Limits |
| 4592 | F | 4/4 | 19-Jun-15 09:54 | 19-Jun-15 | 250 | Within Normal Limits |
| 4593 | F | 4/4 | 19-Jun-15 10:02 | 19-Jun-15 | 470 | Within Normal Limits |
| 4594 | F | 4/4 | 19-Jun-15 10:33 | 19-Jun-15 | 470 | Within Normal Limits |
| 4595 | F | 4/4 | 19-Jun-15 11:00 | 19-Jun-15 | 470 | Within Normal Limits |
| 4596 | F | 4/4 | 19-Jun-15 11:37 | 19-Jun-15 | 470 | Within Normal Limits |

| | Individual Cesarean Section Data | | | | | | | | | | Appendix G |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Animal Number | Corpora Lutea | Implant-ations | Resorptions Early | Late | Total | Dead Fetuses | Live Fetuses Male | Female | Total | Sex Ratio (% Male) | Pre Impl. Loss (%) | Post Impl. Loss (%) |
| Group 1 - 0 mg/m3 | | | | | | | | | | | | |
| 1501ts | 19 | 16 | 0 | 0 | 0 | 0 | 9 | 7 | 16 | 56 | 16 | 0 |
| 1502ts | 15 | 13 | 0 | 0 | 0 | 0 | 6 | 7 | 13 | 46 | 13 | 0 |
| 1503ts | 14 | 12 | 0 | 0 | 0 | 0 | 6 | 6 | 12 | 50 | 14 | 0 |
| 1504ts | 14 | 14 | 0 | 0 | 0 | 0 | 9 | 5 | 14 | 64 | 0 | 0 |
| 1505ts | 15 | 15 | 0 | 0 | 0 | 0 | 6 | 9 | 15 | 40 | 0 | 0 |
| 1506ts | 14 | 14 | 0 | 0 | 0 | 0 | 4 | 10 | 14 | 29 | 0 | 0 |
| 1507ts | 17 | 17 | 1 | 0 | 1 | 0 | 10 | 6 | 16 | 63 | 0 | 6 |
| 1508ts | 14 | 13 | 0 | 0 | 0 | 0 | 4 | 9 | 13 | 31 | 7 | 0 |
| 1509ts | 14 | 13 | 1 | 0 | 1 | 0 | 8 | 4 | 12 | 67 | 7 | 8 |
| 1510ts | 15 | 14 | 1 | 0 | 1 | 0 | 7 | 6 | 13 | 54 | 7 | 7 |
| 1511ts | 13 | 13 | 0 | 0 | 0 | 0 | 7 | 6 | 13 | 54 | 0 | 0 |
| 1512ts | 13 | 13 | 0 | 0 | 0 | 0 | 1 | 12 | 13 | 8 | 0 | 0 |
| 1513ts | 15 | 15 | 2 | 0 | 2 | 0 | 8 | 5 | 13 | 62 | 0 | 13 |
| 1514ts | 14 | 14 | 2 | 0 | 2 | 0 | 6 | 6 | 12 | 50 | 0 | 14 |
| 1515ts | 16 | 15 | 0 | 0 | 0 | 0 | 5 | 10 | 15 | 33 | 6 | 0 |
| 1516ts | 15 | 14 | 0 | 0 | 0 | 0 | 6 | 8 | 14 | 43 | 7 | 0 |
| 1517ts | 15 | 15 | 0 | 0 | 0 | 0 | 7 | 8 | 15 | 47 | 0 | 0 |
| 1518ts | 15 | 14 | 1 | 0 | 1 | 0 | 7 | 6 | 13 | 54 | 7 | 7 |
| 1519ts | 15 | 14 | 0 | 0 | 0 | 0 | 4 | 10 | 14 | 29 | 7 | 0 |
| 1520ts | 13 | 13 | 0 | 0 | 0 | 0 | 8 | 5 | 13 | 62 | 0 | 0 |
| 1521ts,np | - | - | - | - | - | - | - | - | - | - | - | - |
| 1522ts | 16 | 13 | 1 | 0 | 1 | 0 | 5 | 7 | 12 | 42 | 19 | 8 |
| 1523ts | 16 | 14 | 1 | 0 | 1 | 0 | 9 | 4 | 13 | 69 | 13 | 7 |
| 1524ts | 15 | 14 | 0 | 0 | 0 | 0 | 8 | 6 | 14 | 57 | 7 | 0 |

np = not pregnant, ts = terminal sacrifice, Impl = implantation

| | Individual Cesarean Section Data | | | | | | | | | | Appendix G | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Animal Number | Corpora Lutea | Implant-ations | Resorptions Early | Late | Total | Dead Fetuses | Live Fetuses Male | Female | Total | Sex Ratio (% Male) | Pre Impl. Loss (%) | Post Impl. Loss (%) |
| Group 2 - 2000 mg/m3 | | | | | | | | | | | | |
| 2525ts | 20 | 16 | 1 | 0 | 1 | 0 | 7 | 8 | 15 | 47 | 20 | 6 |
| 2526ts | 16 | 16 | 1 | 0 | 1 | 0 | 7 | 8 | 15 | 47 | 0 | 6 |
| 2527ts | 14 | 14 | 0 | 0 | 0 | 0 | 13 | 1 | 14 | 93 | 0 | 0 |
| 2528ts | 16 | 16 | 1 | 0 | 1 | 0 | 8 | 7 | 15 | 53 | 0 | 6 |
| 2529ts | 15 | 15 | 0 | 0 | 0 | 0 | 7 | 8 | 15 | 47 | 0 | 0 |
| 2530ts | 16 | 14 | 0 | 0 | 0 | 0 | 8 | 6 | 14 | 57 | 13 | 0 |
| 2531ts | 13 | 13 | 0 | 0 | 0 | 0 | 6 | 7 | 13 | 46 | 0 | 0 |
| 2532ts | 14 | 14 | 0 | 0 | 0 | 0 | 9 | 5 | 14 | 64 | 0 | 0 |
| 2533ts | 17 | 16 | 1 | 0 | 1 | 0 | 9 | 6 | 15 | 60 | 6 | 6 |
| 2534ts | 8 | 6 | 1 | 0 | 1 | 0 | 2 | 3 | 5 | 40 | 25 | 17 |
| 2535ts | 13 | 13 | 0 | 0 | 0 | 0 | 10 | 3 | 13 | 77 | 0 | 0 |
| 2536ts | 14 | 14 | 2 | 0 | 2 | 0 | 5 | 7 | 12 | 42 | 0 | 14 |
| 2537ts | 13 | 11 | 1 | 0 | 1 | 0 | 4 | 6 | 10 | 40 | 15 | 9 |
| 2538ts | 17 | 15 | 1 | 0 | 1 | 0 | 9 | 5 | 14 | 64 | 12 | 7 |
| 2539ts | 14 | 14 | 1 | 0 | 1 | 0 | 5 | 8 | 13 | 38 | 0 | 7 |
| 2540ts | 17 | 15 | 1 | 0 | 1 | 0 | 10 | 4 | 14 | 71 | 12 | 7 |
| 2541ts | 11 | 9 | 1 | 0 | 1 | 0 | 3 | 5 | 8 | 38 | 18 | 11 |
| 2542ts | 17 | 15 | 0 | 0 | 0 | 0 | 8 | 7 | 15 | 53 | 12 | 0 |
| 2543ts | 15 | 15 | 1 | 0 | 1 | 0 | 5 | 9 | 14 | 36 | 0 | 7 |
| 2544ts | 15 | 14 | 0 | 0 | 0 | 0 | 9 | 5 | 14 | 64 | 7 | 0 |
| 2545ts | 15 | 14 | 0 | 0 | 0 | 0 | 4 | 10 | 14 | 29 | 7 | 0 |
| 2546ts | 15 | 14 | 0 | 0 | 0 | 0 | 11 | 3 | 14 | 79 | 7 | 0 |
| 2547ts | 11 | 10 | 6 | 0 | 6 | 0 | 2 | 2 | 4 | 50 | 9 | 60 |
| 2548ts | 15 | 14 | 2 | 0 | 2 | 0 | 4 | 8 | 12 | 33 | 7 | 14 |

ts = terminal sacrifice, Impl = implantation

| | Individual Cesarean Section Data | | | | | | | | | | Appendix G | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Animal Number | Corpora Lutea | Implant-ations | Resorptions Early | Late | Total | Dead Fetuses | Live Fetuses Male | Female | Total | Sex Ratio (% Male) | Pre Impl. Loss (%) | Post Impl. Loss (%) |
| Group 3 - 10000 mg/m3 | | | | | | | | | | | | |
| 3549ts | 17 | 16 | 0 | 0 | 0 | 0 | 9 | 7 | 16 | 56 | 6 | 0 |
| 3550ts | 14 | 14 | 0 | 0 | 0 | 0 | 8 | 6 | 14 | 57 | 0 | 0 |
| 3551ts | 12 | 11 | 0 | 0 | 0 | 0 | 4 | 7 | 11 | 36 | 8 | 0 |
| 3552ts | 12 | 11 | 0 | 0 | 0 | 0 | 3 | 8 | 11 | 27 | 8 | 0 |
| 3553ts | 15 | 15 | 0 | 0 | 0 | 0 | 7 | 8 | 15 | 47 | 0 | 0 |
| 3554ts | 18 | 18 | 0 | 0 | 0 | 0 | 12 | 6 | 18 | 67 | 0 | 0 |
| 3555ts | 11 | 10 | 0 | 0 | 0 | 0 | 6 | 4 | 10 | 60 | 9 | 0 |
| 3556ts | 16 | 15 | 0 | 0 | 0 | 0 | 5 | 10 | 15 | 33 | 6 | 0 |
| 3557ts | 18 | 17 | 0 | 0 | 0 | 0 | 8 | 9 | 17 | 47 | 6 | 0 |
| 3558ts | 18 | 17 | 1 | 0 | 1 | 0 | 9 | 7 | 16 | 56 | 6 | 6 |
| 3559ts | 14 | 13 | 1 | 0 | 1 | 0 | 5 | 7 | 12 | 42 | 7 | 8 |
| 3560ts | 15 | 15 | 1 | 0 | 1 | 0 | 6 | 8 | 14 | 43 | 0 | 7 |
| 3561ts | 13 | 13 | 0 | 0 | 0 | 0 | 3 | 10 | 13 | 23 | 0 | 0 |
| 3562ts | 16 | 14 | 1 | 0 | 1 | 0 | 10 | 3 | 13 | 77 | 13 | 7 |
| 3563ts | 16 | 16 | 1 | 0 | 1 | 0 | 10 | 5 | 15 | 67 | 0 | 6 |
| 3564ts | 14 | 14 | 0 | 0 | 0 | 0 | 7 | 7 | 14 | 50 | 0 | 0 |
| 3565ts | 12 | 11 | 2 | 0 | 2 | 0 | 4 | 5 | 9 | 44 | 8 | 18 |
| 3566ts | 15 | 15 | 0 | 0 | 0 | 0 | 8 | 7 | 15 | 53 | 0 | 0 |
| 3567ts | 12 | 12 | 2 | 0 | 2 | 0 | 4 | 6 | 10 | 40 | 0 | 17 |
| 3568ts | 17 | 15 | 0 | 0 | 0 | 0 | 6 | 9 | 15 | 40 | 12 | 0 |
| 3569ts | 14 | 14 | 0 | 0 | 0 | 0 | 8 | 6 | 14 | 57 | 0 | 0 |
| 3570ts | 21 | 17 | 0 | 0 | 0 | 0 | 9 | 8 | 17 | 53 | 19 | 0 |
| 3571ts | 16 | 16 | 3 | 0 | 3 | 0 | 10 | 3 | 13 | 77 | 0 | 19 |
| 3572ts | 17 | 17 | 3 | 1 | 4 | 0 | 8 | 5 | 13 | 62 | 0 | 24 |

ts = terminal sacrifice, Impl = implantation

| | Individual Cesarean Section Data | | | | | | | | | | Appendix G | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Animal Number | Corpora Lutea | Implant-ations | Resorptions Early | Late | Total | Dead Fetuses | Live Fetuses Male | Female | Total | Sex Ratio (% Male) | Pre Impl. Loss (%) | Post Impl. Loss (%) |
| Group 4 - 20000 mg/m3 | | | | | | | | | | | | |
| 4573ts | 14 | 13 | 0 | 0 | 0 | 0 | 5 | 8 | 13 | 38 | 7 | 0 |
| 4574ts | 15 | 15 | 0 | 0 | 0 | 0 | 10 | 5 | 15 | 67 | 0 | 0 |
| 4575ts | 18 | 18 | 1 | 0 | 1 | 0 | 8 | 9 | 17 | 47 | 0 | 6 |
| 4576ts | 13 | 12 | 0 | 0 | 0 | 0 | 7 | 5 | 12 | 58 | 8 | 0 |
| 4577ts | 18 | 15 | 2 | 0 | 2 | 0 | 4 | 9 | 13 | 31 | 17 | 13 |
| 4578ts | 16 | 14 | 1 | 0 | 1 | 0 | 7 | 6 | 13 | 54 | 13 | 7 |
| 4579ts | 14 | 14 | 0 | 0 | 0 | 0 | 6 | 8 | 14 | 43 | 0 | 0 |
| 4580ts | 16 | 16 | 3 | 0 | 3 | 0 | 5 | 8 | 13 | 38 | 0 | 19 |
| 4581ts | 14 | 14 | 1 | 0 | 1 | 0 | 4 | 9 | 13 | 31 | 0 | 7 |
| 4582ts | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 50 | 0 | 0 |
| 4583ts | 5 | 5 | 4 | 0 | 4 | 0 | 1 | 0 | 1 | 100 | 0 | 80 |
| 4584ts | 15 | 15 | 1 | 0 | 1 | 0 | 6 | 8 | 14 | 43 | 0 | 7 |
| 4585ts | 15 | 14 | 2 | 0 | 2 | 0 | 6 | 6 | 12 | 50 | 7 | 14 |
| 4586ts | 14 | 14 | 0 | 0 | 0 | 0 | 8 | 6 | 14 | 57 | 0 | 0 |
| 4587ts | 17 | 17 | 2 | 0 | 2 | 0 | 4 | 11 | 15 | 27 | 0 | 12 |
| 4588ts | 17 | 15 | 0 | 0 | 0 | 0 | 9 | 6 | 15 | 60 | 12 | 0 |
| 4589ts | 19 | 19 | 2 | 0 | 2 | 0 | 12 | 5 | 17 | 71 | 0 | 11 |
| 4590ts | 13 | 13 | 0 | 0 | 0 | 0 | 7 | 6 | 13 | 54 | 0 | 0 |
| 4591ts | 15 | 14 | 0 | 0 | 0 | 0 | 7 | 7 | 14 | 50 | 7 | 0 |
| 4592ts,np | - | - | - | - | - | - | - | - | - | - | - | - |
| 4593ts | 11 | 11 | 1 | 0 | 1 | 0 | 3 | 7 | 10 | 30 | 0 | 9 |
| 4594ts | 17 | 16 | 1 | 0 | 1 | 0 | 11 | 4 | 15 | 73 | 6 | 6 |
| 4595ts | 16 | 15 | 0 | 0 | 0 | 0 | 8 | 7 | 15 | 53 | 6 | 0 |
| 4596ts | 14 | 13 | 0 | 1 | 1 | 0 | 6 | 6 | 12 | 50 | 7 | 8 |

np = not pregnant, ts = terminal sacrifice, Impl = implantation

| Females | Individual Gravid Uterine Adjusted Body Weights | Appendix H |
|---|---|---|

| Animal Number | Bodyweight on Day 5 | Bodyweight on Day 20 | Bwt change Days 5-20 | Gravid Uterine Weight | Adj Bwt Day 20 | Adj bwt change Days 5-20 |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | |
| 1501ts | 268 | 410 | 142 | 96.83 | 313 | 45 |
| 1502ts | 251 | 352 | 101 | 83.20 | 268 | 17 |
| 1503ts | 239 | 347 | 108 | 70.05 | 277 | 38 |
| 1504ts | 250 | 375 | 125 | 88.62 | 287 | 37 |
| 1505ts | 236 | 372 | 137 | 85.79 | 287 | 51 |
| 1506ts | 255 | 373 | 118 | 91.36 | 281 | 27 |
| 1507ts | 262 | 408 | 146 | 98.65 | 309 | 47 |
| 1508ts | 255 | 388 | 133 | 84.62 | 304 | 49 |
| 1509ts | 242 | 381 | 139 | 85.04 | 296 | 54 |
| 1510ts | 217 | 337 | 120 | 77.81 | 259 | 42 |
| 1511ts | 244 | 378 | 134 | 86.62 | 291 | 47 |
| 1512ts | 245 | 374 | 129 | 81.24 | 293 | 48 |
| 1513ts | 253 | 386 | 133 | 79.20 | 307 | 54 |
| 1514ts | 242 | 353 | 111 | 55.36 | 298 | 56 |
| 1515ts | 238 | 363 | 126 | 94.08 | 269 | 32 |
| 1516ts | 262 | 404 | 142 | 82.21 | 322 | 60 |
| 1517ts | 250 | 371 | 121 | 89.48 | 282 | 32 |
| 1518ts | 264 | 391 | 128 | 84.04 | 307 | 44 |
| 1519ts | 220 | 376 | 156 | 89.39 | 286 | 66 |
| 1520ts | 225 | 340 | 115 | 82.42 | 258 | 33 |
| 1521np,ts | - | - | - | - | - | - |
| 1522ts | 258 | 364 | 106 | 72.72 | 291 | 33 |
| 1523ts | 216 | 315 | 98 | 80.90 | 234 | 18 |
| 1524ts | 261 | 380 | 119 | 81.58 | 298 | 38 |

np = not pregnant, ts = terminal sacrifice, Bwt = body weight, Adj = adjusted

| Females | Individual Gravid Uterine Adjusted Body Weights | Appendix H |
|---|---|---|

| Animal Number | Bodyweight on Day 5 | Bodyweight on Day 20 | Bwt change Days 5-20 | Gravid Uterine Weight | Adj Bwt Day 20 | Adj bwt change Days 5-20 |
|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | |
| 2525ts | 258 | 382 | 123 | 84.92 | 297 | 38 |
| 2526ts | 229 | 362 | 133 | 87.07 | 275 | 46 |
| 2527ts | 236 | 381 | 146 | 95.12 | 286 | 51 |
| 2528ts | 245 | 383 | 138 | 95.04 | 288 | 43 |
| 2529ts | 234 | 359 | 125 | 90.46 | 268 | 35 |
| 2530ts | 264 | 404 | 141 | 92.95 | 311 | 48 |
| 2531ts | 271 | 410 | 139 | 82.19 | 328 | 57 |
| 2532ts | 318 | 457 | 139 | 97.70 | 359 | 41 |
| 2533ts | 261 | 423 | 162 | 90.48 | 332 | 71 |
| 2534ts | 244 | 337 | 93 | 34.48 | 302 | 58 |
| 2535ts | 227 | 350 | 123 | 82.90 | 267 | 40 |
| 2536ts | 263 | 407 | 144 | 79.47 | 327 | 65 |
| 2537ts | 236 | 349 | 113 | 62.92 | 286 | 50 |
| 2538ts | 245 | 369 | 124 | 87.34 | 282 | 37 |
| 2539ts | 272 | 401 | 129 | 81.46 | 320 | 48 |
| 2540ts | 260 | 390 | 130 | 86.80 | 303 | 43 |
| 2541ts | 238 | 351 | 113 | 48.47 | 302 | 65 |
| 2542ts | 244 | 385 | 141 | 89.78 | 295 | 52 |
| 2543ts | 262 | 392 | 130 | 91.63 | 300 | 38 |
| 2544ts | 235 | 391 | 156 | 87.89 | 303 | 68 |
| 2545ts | 221 | 376 | 155 | 90.64 | 285 | 64 |
| 2546ts | 242 | 365 | 123 | 86.61 | 278 | 36 |
| 2547ts | 261 | 320 | 60 | 31.09 | 289 | 28 |
| 2548ts | 274 | 405 | 131 | 75.08 | 330 | 56 |

ts = terminal sacrifice, Bwt = body weight, Adj = adjusted

| Females | Individual Gravid Uterine Adjusted Body Weights | Appendix H |
|---|---|---|

| Animal Number | Bodyweight on Day 5 | Bodyweight on Day 20 | Bwt change Days 5-20 | Gravid Uterine Weight | Adj Bwt Day 20 | Adj bwt change Days 5-20 |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3549ts | 256 | 381 | 125 | 92.93 | 288 | 32 |
| 3550ts | 257 | 372 | 115 | 83.87 | 288 | 31 |
| 3551ts | 264 | 365 | 101 | 75.98 | 289 | 25 |
| 3552ts | 231 | 318 | 87 | 70.26 | 248 | 17 |
| 3553ts | 251 | 383 | 132 | 96.41 | 286 | 35 |
| 3554ts | 255 | 363 | 108 | 113.04 | 250 | -5 |
| 3555ts | 225 | 349 | 124 | 64.22 | 285 | 60 |
| 3556ts | 255 | 410 | 156 | 95.02 | 315 | 61 |
| 3557ts | 265 | 418 | 153 | 106.68 | 311 | 47 |
| 3558ts | 229 | 357 | 128 | 93.78 | 263 | 34 |
| 3559ts | 248 | 373 | 125 | 77.21 | 296 | 48 |
| 3560ts | 259 | 403 | 144 | 92.29 | 311 | 52 |
| 3561ts | 216 | 328 | 112 | 76.51 | 252 | 35 |
| 3562ts | 268 | 390 | 123 | 58.35 | 332 | 64 |
| 3563ts | 273 | 414 | 142 | 98.90 | 315 | 43 |
| 3564ts | 239 | 367 | 129 | 83.75 | 284 | 45 |
| 3565ts | 269 | 389 | 120 | 61.15 | 328 | 59 |
| 3566ts | 259 | 394 | 135 | 86.04 | 308 | 49 |
| 3567ts | 224 | 372 | 148 | 70.43 | 301 | 77 |
| 3568ts | 235 | 385 | 151 | 83.46 | 302 | 67 |
| 3569ts | 224 | 381 | 157 | 82.67 | 298 | 74 |
| 3570ts | 273 | 425 | 152 | 106.41 | 318 | 45 |
| 3571ts | 244 | 395 | 151 | 83.80 | 311 | 67 |
| 3572ts | 259 | 366 | 107 | 74.96 | 291 | 32 |

ts = terminal sacrifice, Bwt = body weight, Adj = adjusted

| Females | Individual Gravid Uterine Adjusted Body Weights | Appendix H |
|---|---|---|

| Animal Number | Bodyweight on Day 5 | Bodyweight on Day 20 | Bwt change Days 5-20 | Gravid Uterine Weight | Adj Bwt Day 20 | Adj bwt change Days 5-20 |
|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | | |
| 4573ts | 246 | 365 | 119 | 78.43 | 286 | 41 |
| 4574ts | 269 | 364 | 95 | 84.90 | 279 | 10 |
| 4575ts | 281 | 412 | 131 | 105.93 | 306 | 25 |
| 4576ts | 223 | 349 | 126 | 72.70 | 276 | 53 |
| 4577ts | 241 | 366 | 126 | 81.34 | 285 | 45 |
| 4578ts | 270 | 393 | 123 | 89.93 | 303 | 33 |
| 4579ts | 241 | 365 | 124 | 78.45 | 287 | 46 |
| 4580ts | 270 | 409 | 139 | 82.93 | 326 | 56 |
| 4581ts | 283 | 415 | 132 | 85.56 | 330 | 47 |
| 4582ts | 238 | 298 | 60 | 16.04 | 282 | 44 |
| 4583ts | 217 | 280 | 63 | 9.35 | 270 | 53 |
| 4584ts | 243 | 388 | 145 | 90.15 | 298 | 55 |
| 4585ts | 244 | 378 | 134 | 77.62 | 300 | 56 |
| 4586ts | 261 | 390 | 129 | 85.92 | 304 | 43 |
| 4587ts | 261 | 408 | 147 | 102.20 | 306 | 45 |
| 4588ts | 269 | 401 | 132 | 96.11 | 305 | 36 |
| 4589ts | 253 | 397 | 144 | 102.77 | 295 | 41 |
| 4590ts | 266 | 384 | 119 | 76.04 | 308 | 43 |
| 4591ts | 241 | 396 | 155 | 83.77 | 312 | 71 |
| 4592np,ts | - | - | - | - | - | - |
| 4593ts | 203 | 325 | 122 | 63.52 | 262 | 59 |
| 4594ts | 295 | 457 | 162 | 92.80 | 364 | 69 |
| 4595ts | 251 | 373 | 123 | 93.90 | 279 | 29 |
| 4596ts | 260 | 371 | 111 | 78.46 | 292 | 33 |

np = not pregnant, ts = terminal sacrifice, Bwt = body weight, Adj = adjusted

| | | |
|---|---|---|
| | Individual Litter Weights<br>Preface | <br>Appendix I |

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| | Individual Litter Weights<br>Placental, Litter and Fetal Weights by Litter (g) | Appendix I |
|---|---|---|

| Animal Number | Mean Placental Weights | Total Litter Weight | Mean Fetal Weight Male | Female | Overall |
|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | |
| 1501ts | 0.51 | 59.9 | 3.9 | 3.5 | 3.7 |
| 1502ts | 0.57 | 51.7 | 4.1 | 3.9 | 4.0 |
| 1503ts | 0.50 | 44.5 | 3.8 | 3.6 | 3.7 |
| 1504ts | 0.50 | 58.6 | 4.3 | 4.1 | 4.2 |
| 1505ts | 0.60 | 52.1 | 3.5 | 3.4 | 3.5 |
| 1506ts | 0.53 | 58.8 | 4.4 | 4.1 | 4.2 |
| 1507ts | 0.56 | 62.9 | 4.0 | 3.8 | 3.9 |
| 1508ts | 0.60 | 52.9 | 4.3 | 4.0 | 4.1 |
| 1509ts | 0.61 | 52.4 | 4.4 | 4.4 | 4.4 |
| 1510ts | 0.50 | 46.9 | 3.7 | 3.5 | 3.6 |
| 1511ts | 0.63 | 52.5 | 4.2 | 3.9 | 4.0 |
| 1512ts | 0.50 | 51.5 | 4.3 | 3.9 | 4.0 |
| 1513ts | 0.55 | 51.0 | 3.9 | 3.9 | 3.9 |
| 1514ts | 0.46 | 28.7 | 2.4 | 2.4 | 2.4 |
| 1515ts | 0.52 | 59.8 | 4.2 | 3.9 | 4.0 |
| 1516ts | 0.52 | 51.5 | 3.8 | 3.6 | 3.7 |
| 1517ts | 0.59 | 57.6 | 4.0 | 3.7 | 3.8 |
| 1518ts | 0.55 | 50.8 | 4.0 | 3.8 | 3.9 |
| 1519ts | 0.56 | 59.1 | 4.4 | 4.1 | 4.2 |
| 1520ts | 0.60 | 51.7 | 4.1 | 3.8 | 4.0 |
| 1521ts,np | - | - | - | - | - |
| 1522ts | 0.54 | 45.6 | 3.9 | 3.7 | 3.8 |
| 1523ts | 0.50 | 50.9 | 4.0 | 3.7 | 3.9 |
| 1524ts | 0.46 | 53.4 | 3.9 | 3.7 | 3.8 |

np = not pregnant, ts = terminal sacrifice

| | Individual Litter Weights<br>Placental, Litter and Fetal Weights by Litter (g) | Appendix I |
|---|---|---|

| Animal Number | Mean Placental Weights | Total Litter Weight | Mean Fetal Weight Male | Female | Overall |
|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | |
| 2525ts | 0.42 | 56.2 | 3.7 | 3.8 | 3.7 |
| 2526ts | 0.45 | 57.0 | 3.9 | 3.7 | 3.8 |
| 2527ts | 0.64 | 56.5 | 4.1 | 3.9 | 4.0 |
| 2528ts | 0.52 | 63.0 | 4.2 | 4.2 | 4.2 |
| 2529ts | 0.50 | 59.3 | 4.0 | 3.9 | 4.0 |
| 2530ts | 0.58 | 58.7 | 4.3 | 4.0 | 4.2 |
| 2531ts | 0.51 | 53.1 | 4.3 | 3.9 | 4.1 |
| 2532ts | 0.55 | 62.3 | 4.5 | 4.3 | 4.4 |
| 2533ts | 0.61 | 56.6 | 3.8 | 3.7 | 3.8 |
| 2534ts | 0.65 | 19.7 | 4.0 | 3.9 | 3.9 |
| 2535ts | 0.55 | 52.6 | 4.1 | 3.9 | 4.0 |
| 2536ts | 0.59 | 49.1 | 4.1 | 4.1 | 4.1 |
| 2537ts | 0.55 | 37.7 | 4.1 | 3.6 | 3.8 |
| 2538ts | 0.53 | 55.7 | 4.0 | 4.0 | 4.0 |
| 2539ts | 0.54 | 49.6 | 4.0 | 3.7 | 3.8 |
| 2540ts | 0.61 | 55.7 | 4.1 | 3.8 | 4.0 |
| 2541ts | 0.53 | 29.5 | 3.8 | 3.6 | 3.7 |
| 2542ts | 0.55 | 58.3 | 3.9 | 3.8 | 3.9 |
| 2543ts | 0.55 | 56.8 | 4.3 | 3.9 | 4.1 |
| 2544ts | 0.44 | 58.8 | 4.3 | 4.1 | 4.2 |
| 2545ts | 0.50 | 54.6 | 3.9 | 3.9 | 3.9 |
| 2546ts | 0.59 | 54.2 | 3.9 | 3.9 | 3.9 |
| 2547ts | 0.64 | 18.1 | 4.7 | 4.4 | 4.5 |
| 2548ts | 0.55 | 46.5 | 3.9 | 3.8 | 3.9 |

ts = terminal sacrifice

| | Individual Litter Weights<br>Placental, Litter and Fetal Weights by Litter (g) | Appendix I |
|---|---|---|

| Animal Number | Mean Placental Weights | Total Litter Weight | Mean Fetal Weight Male | Female | Overall |
|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | |
| 3549ts | 0.53 | 58.2 | 3.7 | 3.5 | 3.6 |
| 3550ts | 0.50 | 53.4 | 4.0 | 3.6 | 3.8 |
| 3551ts | 0.57 | 47.5 | 4.4 | 4.2 | 4.3 |
| 3552ts | 0.54 | 46.2 | 4.3 | 4.2 | 4.2 |
| 3553ts | 0.56 | 61.4 | 4.1 | 4.1 | 4.1 |
| 3554ts | 0.53 | 72.9 | 4.1 | 3.9 | 4.1 |
| 3555ts | 0.56 | 38.9 | 4.0 | 3.8 | 3.9 |
| 3556ts | 0.51 | 61.2 | 4.2 | 4.0 | 4.1 |
| 3557ts | 0.51 | 68.6 | 4.3 | 3.8 | 4.0 |
| 3558ts | 0.47 | 63.1 | 4.0 | 3.8 | 3.9 |
| 3559ts | 0.51 | 48.8 | 4.1 | 4.1 | 4.1 |
| 3560ts | 0.64 | 55.9 | 4.1 | 3.9 | 4.0 |
| 3561ts | 0.57 | 47.1 | 3.6 | 3.6 | 3.6 |
| 3562ts | 0.46 | 30.5 | 2.4 | 2.1 | 2.3 |
| 3563ts | 0.54 | 63.2 | 4.3 | 4.0 | 4.2 |
| 3564ts | 0.51 | 53.5 | 4.0 | 3.7 | 3.8 |
| 3565ts | 0.63 | 38.6 | 4.4 | 4.2 | 4.3 |
| 3566ts | 0.49 | 54.2 | 3.6 | 3.6 | 3.6 |
| 3567ts | 0.53 | 44.7 | 4.6 | 4.4 | 4.5 |
| 3568ts | 0.42 | 52.8 | 3.6 | 3.4 | 3.5 |
| 3569ts | 0.53 | 52.2 | 3.9 | 3.5 | 3.7 |
| 3570ts | 0.57 | 65.3 | 3.9 | 3.8 | 3.8 |
| 3571ts | 0.51 | 54.6 | 4.2 | 4.1 | 4.2 |
| 3572ts | 0.46 | 46.4 | 3.7 | 3.4 | 3.6 |

ts = terminal sacrifice

| | Individual Litter Weights<br>Placental, Litter and Fetal Weights by Litter (g) | Appendix I |
|---|---|---|

| Animal Number | Mean Placental Weights | Total Litter Weight | Mean Fetal Weight Male | Female | Overall |
|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | |
| 4573ts | 0.56 | 48.0 | 3.8 | 3.6 | 3.7 |
| 4574ts | 0.37 | 56.6 | 3.9 | 3.5 | 3.8 |
| 4575ts | 0.51 | 66.2 | 4.0 | 3.8 | 3.9 |
| 4576ts | 0.52 | 46.0 | 3.9 | 3.7 | 3.8 |
| 4577ts | 0.55 | 52.0 | 4.2 | 3.9 | 4.0 |
| 4578ts | 0.60 | 55.9 | 4.4 | 4.1 | 4.3 |
| 4579ts | 0.47 | 51.4 | 3.9 | 3.5 | 3.7 |
| 4580ts | 0.53 | 55.2 | 4.4 | 4.1 | 4.2 |
| 4581ts | 0.58 | 53.1 | 4.3 | 4.0 | 4.1 |
| 4582ts | 0.78 | 8.2 | 3.8 | 4.4 | 4.1 |
| 4583ts | 0.90 | 3.5 | 3.5 | - | 3.5 |
| 4584ts | 0.49 | 57.6 | 4.3 | 4.0 | 4.1 |
| 4585ts | 0.53 | 46.1 | 4.0 | 3.7 | 3.8 |
| 4586ts | 0.58 | 53.3 | 4.0 | 3.6 | 3.8 |
| 4587ts | 0.62 | 63.2 | 4.5 | 4.1 | 4.2 |
| 4588ts | 0.55 | 58.3 | 3.9 | 3.8 | 3.9 |
| 4589ts | 0.53 | 67.1 | 4.0 | 3.9 | 3.9 |
| 4590ts | 0.52 | 47.8 | 3.8 | 3.5 | 3.7 |
| 4591ts | 0.57 | 53.4 | 4.0 | 3.7 | 3.8 |
| 4592ts,np | - | - | - | - | - |
| 4593ts | 0.55 | 38.7 | 4.1 | 3.8 | 3.9 |
| 4594ts | 0.51 | 59.2 | 4.1 | 3.6 | 3.9 |
| 4595ts | 0.47 | 62.1 | 4.3 | 3.9 | 4.1 |

np = not pregnant, ts = terminal sacrifice

| Females | Individual Litter Weights<br>Fetal Weights (g) | Appendix I |
|---|---|---|

| Animal Number | Weights Mean | Fetus 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | | | | | | | | | | | | | | | | | | |
| 1501 | 3.7 | 3.6 | 3.8 | 4.1 | 4.0 | 3.9 | 3.5 | 4.0 | 3.8 | 3.4 | 3.4 | 3.7 | 3.6 | 4.1 | 4.0 | 3.7 | 3.4 | | | | | | |
| 1502 | 4.0 | 3.6 | 3.9 | 3.7 | 3.9 | 4.2 | 3.8 | 4.2 | 4.1 | 4.0 | 4.2 | 4.3 | 4.1 | 3.7 | | | | | | | | | |
| 1503 | 3.7 | 3.6 | 3.3 | 3.9 | 4.0 | 3.9 | 3.4 | 3.5 | 3.8 | 3.7 | 3.4 | 3.8 | 4.2 | | | | | | | | | | |
| 1504 | 4.2 | 3.7 | 4.3 | 3.6 | 3.9 | 4.7 | 4.0 | 4.4 | 4.1 | 3.9 | 4.4 | 4.4 | 4.2 | 4.6 | 4.5 | | | | | | | | |
| 1505 | 3.5 | 2.8 | 3.7 | 2.8 | 3.6 | 3.6 | 3.5 | 3.8 | 3.6 | 3.6 | 3.1 | 3.8 | 3.5 | 3.9 | 3.7 | 3.1 | | | | | | | |
| 1506 | 4.2 | 4.1 | 4.2 | 4.2 | 4.3 | 4.1 | 4.2 | 4.2 | 4.0 | 4.4 | 4.2 | 4.7 | 4.4 | 3.9 | 4.1 | | | | | | | | |
| 1507 | 3.9 | 3.7 | 4.0 | 4.0 | 4.2 | 4.1 | 3.8 | 3.9 | 4.1 | 3.6 | 3.6 | 3.7 | 3.9 | 4.5 | 4.1 | 4.1 | 3.7 | | | | | | |
| 1508 | 4.1 | 3.7 | 4.4 | 3.8 | 4.1 | 4.0 | 3.7 | 4.1 | 4.5 | 4.3 | 4.1 | 4.2 | 4.0 | 4.0 | | | | | | | | | |
| 1509 | 4.4 | 4.2 | 4.2 | 4.6 | 4.3 | 4.3 | 4.0 | 4.7 | 4.3 | 4.5 | 4.3 | 4.6 | 4.5 | | | | | | | | | | |
| 1510 | 3.6 | 3.7 | 3.5 | 3.7 | 2.9 | 3.7 | 3.5 | 3.4 | 3.8 | 3.9 | 3.7 | 3.4 | 3.8 | 4.0 | | | | | | | | | |
| 1511 | 4.0 | 3.8 | 4.1 | 3.9 | 4.1 | 3.7 | 4.3 | 4.3 | 4.1 | 4.0 | 4.3 | 4.0 | 4.1 | 3.8 | | | | | | | | | |
| 1512 | 4.0 | 3.8 | 4.0 | 4.0 | 4.2 | 3.8 | 4.0 | 4.0 | 4.0 | 3.9 | 4.0 | 4.3 | 3.8 | 3.8 | | | | | | | | | |
| 1513 | 3.9 | 3.8 | 4.1 | 3.5 | 4.2 | 4.0 | 4.1 | 3.9 | 4.1 | 4.0 | 3.7 | 3.9 | 3.6 | 4.1 | | | | | | | | | |
| 1514 | 2.4 | 2.3 | 2.3 | 2.4 | 2.4 | 2.5 | 2.6 | 2.5 | 2.3 | 2.3 | 2.5 | 2.2 | 2.2 | | | | | | | | | | |
| 1515 | 4.0 | 3.9 | 3.9 | 4.5 | 4.1 | 4.3 | 4.0 | 3.9 | 4.0 | 3.6 | 3.8 | 3.9 | 3.8 | 4.2 | 4.1 | 3.8 | | | | | | | |
| 1516 | 3.7 | 3.5 | 3.9 | 4.0 | 3.7 | 3.6 | 3.7 | 3.7 | 3.7 | 3.5 | 3.4 | 3.6 | 3.9 | 3.8 | 3.5 | | | | | | | | |
| 1517 | 3.8 | 3.8 | 3.5 | 4.2 | 4.1 | 4.0 | 3.9 | 4.0 | 4.1 | 4.1 | 3.5 | 4.0 | 4.0 | 3.3 | 3.8 | 3.4 | | | | | | | |
| 1518 | 3.9 | 3.9 | 3.6 | 3.8 | 4.3 | 4.0 | 4.1 | 3.9 | 3.9 | 3.4 | 3.8 | 3.9 | 4.0 | 4.1 | | | | | | | | | |
| 1519 | 4.2 | 3.8 | 3.9 | 4.2 | 4.4 | 3.9 | 4.3 | 4.5 | 4.1 | 4.2 | 4.6 | 4.3 | 4.6 | 4.3 | 4.0 | | | | | | | | |
| 1520 | 4.0 | 3.9 | 4.1 | 3.9 | 4.1 | 4.4 | 3.7 | 4.1 | 4.1 | 3.8 | 4.0 | 4.0 | 4.1 | 3.5 | | | | | | | | | |
| 1522 | 3.8 | 3.8 | 3.7 | 4.1 | 3.8 | 3.6 | 4.0 | 3.6 | 3.7 | 3.7 | 3.8 | 4.0 | 3.7 | | | | | | | | | | |
| 1523 | 3.9 | 4.1 | 4.1 | 4.1 | 4.0 | 3.9 | 3.9 | 3.5 | 3.7 | 4.1 | 4.0 | 4.5 | 3.6 | 3.5 | | | | | | | | | |
| 1524 | 3.8 | 3.6 | 3.7 | 3.7 | 3.8 | 3.5 | 3.4 | 3.9 | 3.6 | 3.7 | 4.1 | 3.9 | 4.0 | 3.9 | 4.3 | | | | | | | | |

| Females | Individual Litter Weights<br>Fetal Weights (g) | Appendix I |
|---|---|---|

| Animal Number | Weights Mean | Fetus 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | | | | | | | | | | | | | | | | | | |
| 2525 | 3.7 | 3.7 | 3.6 | 3.8 | 3.7 | 3.6 | 3.8 | 4.0 | 4.1 | 3.1 | 3.6 | 3.9 | 3.9 | 3.5 | 3.9 | 4.1 | | | | | | | |
| 2526 | 3.8 | 3.6 | 4.0 | 4.2 | 4.1 | 4.0 | 3.5 | 3.5 | 3.8 | 3.7 | 3.3 | 3.8 | 3.8 | 4.1 | 3.9 | 3.8 | | | | | | | |
| 2527 | 4.0 | 3.8 | 4.2 | 4.4 | 3.7 | 4.0 | 4.0 | 4.0 | 4.1 | 4.0 | 4.1 | 4.1 | 3.9 | 4.2 | 4.1 | | | | | | | | |
| 2528 | 4.2 | 4.2 | 4.5 | 4.4 | 4.1 | 4.3 | 4.5 | 4.1 | 3.9 | 4.1 | 4.1 | 4.4 | 4.2 | 4.2 | 4.1 | 4.0 | | | | | | | |
| 2529 | 4.0 | 3.5 | 3.9 | 4.0 | 3.7 | 3.9 | 4.1 | 3.8 | 4.1 | 4.1 | 3.8 | 4.1 | 4.1 | 4.2 | 3.9 | 3.9 | | | | | | | |
| 2530 | 4.2 | 4.0 | 4.0 | 4.5 | 4.2 | 4.4 | 4.0 | 3.9 | 4.4 | 4.2 | 4.4 | 4.2 | 4.5 | 4.1 | 3.7 | | | | | | | | |
| 2531 | 4.1 | 4.3 | 4.4 | 2.6 | 4.1 | 4.3 | 3.9 | 4.2 | 4.1 | 4.3 | 4.5 | 4.2 | 4.1 | 4.1 | | | | | | | | | |
| 2532 | 4.4 | 4.3 | 4.4 | 4.6 | 4.1 | 4.4 | 4.3 | 4.4 | 4.5 | 4.8 | 4.4 | 4.4 | 4.4 | 4.9 | 4.3 | | | | | | | | |
| 2533 | 3.8 | 3.5 | 3.6 | 3.7 | 3.9 | 3.8 | 3.7 | 3.6 | 4.0 | 3.7 | 4.0 | 4.0 | 3.7 | 4.1 | 3.7 | 3.7 | | | | | | | |
| 2534 | 3.9 | 4.0 | 4.0 | 3.8 | 3.9 | 4.1 | | | | | | | | | | | | | | | | | |
| 2535 | 4.0 | 4.1 | 3.9 | 4.2 | 4.3 | 4.2 | 3.9 | 3.6 | 3.7 | 4.0 | 4.4 | 4.3 | 4.1 | 3.7 | | | | | | | | | |
| 2536 | 4.1 | 4.1 | 4.2 | 4.2 | 4.0 | 4.0 | 4.1 | 4.2 | 4.1 | 4.2 | 4.0 | 4.1 | 3.8 | | | | | | | | | | |
| 2537 | 3.8 | 3.1 | 3.9 | 3.7 | 4.0 | 3.5 | 3.6 | 3.8 | 4.3 | 4.1 | 3.8 | | | | | | | | | | | | |
| 2538 | 4.0 | 3.9 | 3.9 | 4.1 | 3.9 | 4.0 | 3.9 | 4.1 | 3.9 | 3.9 | 4.1 | 4.1 | 3.9 | 4.1 | 4.0 | | | | | | | | |
| 2539 | 3.8 | 3.8 | 3.7 | 3.9 | 3.8 | 3.9 | 3.9 | 3.9 | 4.4 | 3.7 | 4.1 | 3.5 | 3.6 | 3.3 | | | | | | | | | |
| 2540 | 4.0 | 4.0 | 4.0 | 4.3 | 3.8 | 4.0 | 4.0 | 4.2 | 4.2 | 3.8 | 3.7 | 4.1 | 3.6 | 4.0 | 4.0 | | | | | | | | |
| 2541 | 3.7 | 3.4 | 3.4 | 3.8 | 3.8 | 3.8 | 3.9 | 3.8 | 3.8 | | | | | | | | | | | | | | |
| 2542 | 3.9 | 3.3 | 3.9 | 4.1 | 3.7 | 3.8 | 3.7 | 3.5 | 3.8 | 3.9 | 3.9 | 4.1 | 4.0 | 4.5 | 4.1 | 4.1 | | | | | | | |
| 2543 | 4.1 | 4.3 | 4.4 | 4.0 | 3.8 | 4.4 | 3.7 | 4.1 | 4.2 | 4.3 | 4.0 | 3.6 | 4.3 | 4.1 | 3.4 | | | | | | | | |
| 2544 | 4.2 | 4.1 | 4.2 | 4.5 | 4.4 | 4.2 | 4.1 | 4.4 | 4.4 | 4.0 | 4.4 | 3.8 | 4.0 | 4.2 | 4.0 | | | | | | | | |
| 2545 | 3.9 | 3.9 | 4.0 | 4.0 | 3.9 | 3.9 | 4.2 | 3.7 | 3.9 | 3.6 | 4.1 | 3.8 | 3.8 | 4.1 | 3.8 | | | | | | | | |
| 2546 | 3.9 | 3.5 | 3.6 | 4.0 | 4.0 | 4.1 | 3.9 | 3.7 | 3.9 | 4.0 | 3.9 | 3.9 | 4.1 | 4.0 | 3.5 | | | | | | | | |
| 2547 | 4.5 | 4.8 | 4.2 | 4.6 | 4.5 | | | | | | | | | | | | | | | | | | |
| 2548 | 3.9 | 3.8 | 3.9 | 3.9 | 3.9 | 3.6 | 3.9 | 4.2 | 4.0 | 3.4 | 3.3 | 4.4 | 4.3 | | | | | | | | | | |

| Females | Individual Litter Weights<br>Fetal Weights (g) | Appendix I |
|---|---|---|

| Animal Number | Weights Mean | Fetus 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | | | | | | | | | | | | | | | | | | |
| 3549 | 3.6 | 3.6 | 3.3 | 4.0 | 3.5 | 3.6 | 3.8 | 3.7 | 3.6 | 3.7 | 3.1 | 3.6 | 3.9 | 3.4 | 3.6 | 3.7 | 4.1 | | | | | | |
| 3550 | 3.8 | 3.8 | 3.4 | 4.1 | 3.7 | 3.8 | 3.7 | 3.6 | 4.0 | 4.0 | 4.0 | 4.0 | 4.2 | 3.2 | 3.9 | | | | | | | | |
| 3551 | 4.3 | 4.5 | 4.4 | 4.2 | 4.4 | 4.4 | 4.4 | 4.2 | 4.5 | 4.1 | 4.4 | 4.1 | | | | | | | | | | | |
| 3552 | 4.2 | 4.4 | 4.1 | 4.1 | 4.4 | 4.2 | 3.9 | 4.2 | 4.1 | 4.3 | 4.3 | 4.3 | | | | | | | | | | | |
| 3553 | 4.1 | 4.1 | 3.9 | 4.1 | 4.0 | 4.3 | 4.0 | 4.1 | 4.3 | 4.1 | 4.2 | 4.1 | 4.2 | 4.2 | 4.0 | 4.0 | | | | | | | |
| 3554 | 4.1 | 4.3 | 3.6 | 3.7 | 3.8 | 3.8 | 3.9 | 4.1 | 4.1 | 3.9 | 4.0 | 4.0 | 4.0 | 4.2 | 4.0 | 4.5 | 4.0 | 4.5 | 4.4 | | | | |
| 3555 | 3.9 | 3.6 | 4.5 | 4.0 | 4.0 | 3.9 | 3.8 | 3.8 | 3.9 | 3.7 | 3.7 | | | | | | | | | | | | |
| 3556 | 4.1 | 4.0 | 4.0 | 4.0 | 4.0 | 4.1 | 4.0 | 4.5 | 4.2 | 3.9 | 4.4 | 3.9 | 3.8 | 4.2 | 4.1 | 4.0 | | | | | | | |
| 3557 | 4.0 | 3.7 | 4.1 | 3.7 | 3.8 | 3.8 | 4.2 | 4.2 | 3.4 | 3.7 | 3.7 | 4.2 | 4.3 | 4.5 | 4.6 | 3.8 | 4.5 | 4.5 | | | | | |
| 3558 | 3.9 | 3.8 | 3.8 | 4.2 | 4.0 | 4.0 | 3.8 | 3.9 | 3.9 | 3.6 | 4.0 | 4.2 | 4.0 | 3.9 | 4.2 | 4.0 | 3.8 | | | | | | |
| 3559 | 4.1 | 3.6 | 4.2 | 4.2 | 4.2 | 4.2 | 3.9 | 4.2 | 3.9 | 3.9 | 4.1 | 4.3 | 4.2 | | | | | | | | | | |
| 3560 | 4.0 | 3.7 | 4.0 | 4.2 | 4.1 | 3.8 | 4.1 | 4.0 | 3.9 | 4.2 | 3.9 | 4.1 | 4.1 | 3.9 | 3.8 | | | | | | | | |
| 3561 | 3.6 | 3.5 | 3.6 | 3.9 | 3.5 | 3.7 | 3.7 | 3.5 | 3.6 | 3.7 | 3.7 | 3.7 | 3.4 | 3.5 | | | | | | | | | |
| 3562 | 2.3 | 2.4 | 2.5 | 2.2 | 2.4 | 2.5 | 2.3 | 2.2 | 2.3 | 2.1 | 2.3 | 2.5 | 2.1 | 2.5 | | | | | | | | | |
| 3563 | 4.2 | 4.0 | 4.3 | 4.3 | 4.1 | 4.2 | 4.3 | 4.3 | 4.2 | 4.4 | 4.6 | 4.2 | 3.4 | 4.1 | 4.4 | 4.3 | | | | | | | |
| 3564 | 3.8 | 4.0 | 3.7 | 3.8 | 3.3 | 3.6 | 4.1 | 3.6 | 4.0 | 3.8 | 3.8 | 3.8 | 4.3 | 4.0 | 3.7 | | | | | | | | |
| 3565 | 4.3 | 4.5 | 4.3 | 4.3 | 4.5 | 4.3 | 4.2 | 4.2 | 4.1 | 4.1 | | | | | | | | | | | | | |
| 3566 | 3.6 | 3.6 | 3.5 | 3.3 | 3.5 | 3.3 | 3.6 | 3.5 | 3.9 | 3.6 | 3.8 | 4.0 | 3.7 | 3.5 | 3.6 | 3.8 | | | | | | | |
| 3567 | 4.5 | 4.5 | 4.4 | 4.9 | 5.1 | 4.6 | 4.4 | 4.5 | 3.7 | 4.4 | 4.2 | | | | | | | | | | | | |
| 3568 | 3.5 | 3.6 | 3.5 | 3.6 | 3.4 | 3.7 | 3.5 | 3.5 | 3.4 | 3.7 | 3.6 | 4.0 | 3.6 | 3.6 | 3.1 | 3.1 | | | | | | | |
| 3569 | 3.7 | 3.6 | 3.9 | 4.0 | 3.9 | 4.1 | 3.7 | 3.2 | 3.8 | 3.6 | 3.8 | 3.4 | 3.7 | 3.6 | 3.7 | | | | | | | | |
| 3570 | 3.8 | 3.7 | 3.8 | 3.9 | 3.7 | 3.7 | 3.8 | 4.0 | 3.9 | 3.8 | 3.8 | 3.5 | 3.9 | 4.0 | 4.1 | 3.9 | 4.2 | 3.8 | | | | | |
| 3571 | 4.2 | 3.9 | 4.6 | 4.1 | 4.4 | 4.4 | 4.2 | 4.4 | 4.2 | 4.5 | 4.6 | 3.5 | 4.3 | 3.6 | | | | | | | | | |
| 3572 | 3.6 | 2.8 | 3.5 | 4.2 | 3.8 | 3.7 | 3.5 | 3.7 | 3.2 | 3.2 | 3.2 | 3.9 | 3.8 | 4.0 | | | | | | | | | |

| Females | Individual Litter Weights<br>Fetal Weights (g) | Appendix I |
|---|---|---|

| Animal Number | Weights Mean | Fetus 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | | | | | | | | | | | | | | | | | | | |
| 4573 | 3.7 | 3.8 | 4.0 | 3.4 | 3.8 | 3.7 | 3.5 | 3.6 | 3.8 | 3.7 | 3.6 | 3.8 | 3.7 | 3.6 | | | | | | | | | |
| 4574 | 3.8 | 4.3 | 3.7 | 3.5 | 3.9 | 4.1 | 3.5 | 3.7 | 3.5 | 3.5 | 3.9 | 3.7 | 3.9 | 3.7 | 4.0 | 3.9 | | | | | | | |
| 4575 | 3.9 | 3.8 | 3.9 | 3.9 | 3.7 | 4.0 | 4.1 | 4.0 | 4.0 | 4.0 | 4.1 | 3.8 | 3.9 | 3.7 | 4.1 | 3.7 | 3.6 | 3.9 | | | | | |
| 4576 | 3.8 | 3.9 | 3.4 | 4.1 | 3.6 | 3.9 | 4.2 | 3.7 | 3.5 | 3.7 | 4.1 | 3.7 | 4.1 | | | | | | | | | | |
| 4577 | 4.0 | 3.0 | 3.6 | 4.0 | 4.6 | 4.7 | 4.1 | 4.0 | 4.0 | 4.0 | 4.1 | 3.9 | 4.2 | 3.9 | | | | | | | | | |
| 4578 | 4.3 | 4.0 | 4.2 | 4.6 | 4.2 | 4.5 | 4.3 | 4.5 | 4.1 | 4.7 | 3.8 | 4.4 | 4.2 | 4.4 | | | | | | | | | |
| 4579 | 3.7 | 3.7 | 3.5 | 3.8 | 4.1 | 3.3 | 3.7 | 3.9 | 3.6 | 3.9 | 3.6 | 3.5 | 3.5 | 3.7 | 3.6 | | | | | | | | |
| 4580 | 4.2 | 3.9 | 4.3 | 3.9 | 4.3 | 4.3 | 4.0 | 4.3 | 4.1 | 4.6 | 4.5 | 4.4 | 4.1 | 4.3 | | | | | | | | | |
| 4581 | 4.1 | 3.8 | 4.0 | 4.4 | 4.0 | 4.2 | 4.1 | 4.1 | 4.2 | 4.2 | 4.2 | 4.2 | 4.1 | 3.7 | | | | | | | | | |
| 4582 | 4.1 | 4.4 | 3.8 | | | | | | | | | | | | | | | | | | | | |
| 4583 | 3.5 | 3.5 | | | | | | | | | | | | | | | | | | | | | |
| 4584 | 4.1 | 4.0 | 3.9 | 3.7 | 4.2 | 4.5 | 4.2 | 4.3 | 4.1 | 3.9 | 4.2 | 3.9 | 3.9 | 4.4 | 4.4 | | | | | | | | |
| 4585 | 3.8 | 3.7 | 3.3 | 3.9 | 4.1 | 3.9 | 4.4 | 4.1 | 3.9 | 3.7 | 3.8 | 3.9 | 3.3 | | | | | | | | | | |
| 4586 | 3.8 | 3.6 | 3.8 | 3.7 | 3.6 | 3.3 | 4.2 | 4.0 | 4.1 | 4.0 | 3.9 | 3.7 | 4.1 | 4.2 | 3.2 | | | | | | | | |
| 4587 | 4.2 | 4.7 | 4.2 | 4.5 | 4.3 | 4.2 | 4.1 | 3.8 | 4.4 | 4.4 | 4.0 | 3.3 | 4.6 | 4.0 | 4.5 | 4.3 | | | | | | | |
| 4588 | 3.9 | 3.9 | 4.2 | 3.7 | 4.0 | 3.8 | 3.7 | 3.8 | 3.8 | 3.7 | 4.0 | 4.0 | 3.7 | 4.1 | 4.1 | 3.9 | | | | | | | |
| 4589 | 3.9 | 4.1 | 4.2 | 3.9 | 4.0 | 3.9 | 4.1 | 3.8 | 4.0 | 4.0 | 3.8 | 3.9 | 3.6 | 4.0 | 4.0 | 3.7 | 4.2 | 4.0 | | | | | |
| 4590 | 3.7 | 3.6 | 3.5 | 3.7 | 2.8 | 3.3 | 3.8 | 3.8 | 4.1 | 4.2 | 3.8 | 3.7 | 4.0 | 3.6 | | | | | | | | | |
| 4591 | 3.8 | 3.6 | 3.5 | 3.9 | 4.0 | 3.4 | 3.9 | 3.8 | 3.6 | 4.0 | 4.2 | 4.3 | 3.8 | 4.1 | 3.5 | | | | | | | | |
| 4593 | 3.9 | 4.1 | 4.0 | 3.9 | 4.2 | 3.8 | 4.0 | 3.7 | 3.1 | 4.1 | 3.7 | | | | | | | | | | | | |
| 4594 | 3.9 | 4.3 | 4.1 | 4.0 | 4.3 | 4.1 | 4.2 | 3.1 | 3.7 | 3.9 | 3.9 | 3.9 | 3.8 | 4.3 | 3.7 | 3.8 | | | | | | | |
| 4595 | 4.1 | 3.8 | 4.8 | 4.4 | 4.2 | 3.8 | 4.4 | 3.8 | 4.2 | 3.8 | 4.2 | 4.0 | 4.5 | 4.2 | 4.0 | 4.1 | | | | | | | |
| 4596 | 4.0 | 3.6 | 4.0 | 3.9 | 4.1 | 4.1 | 4.3 | 4.1 | 4.2 | 4.1 | 4.4 | 3.9 | 3.6 | | | | | | | | | | |

| Females | Individual Litter Weights<br>Placental Weights (g) | Appendix I |
|---|---|---|

| Animal Number | Weights Mean | Fetus 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | | | | | | | | | | | | | | | | | | |
| 1501 | 0.51 | 0.50 | 0.55 | 0.65 | 0.58 | 0.63 | 0.44 | 0.48 | 0.50 | 0.47 | 0.42 | 0.55 | 0.48 | 0.47 | 0.54 | 0.49 | 0.47 | | | | | | |
| 1502 | 0.57 | 0.57 | 0.51 | 0.49 | 0.53 | 0.52 | 0.54 | 0.60 | 0.53 | 0.54 | 0.71 | 0.61 | 0.72 | 0.53 | | | | | | | | | |
| 1503 | 0.50 | 0.50 | 0.49 | 0.57 | 0.51 | 0.43 | 0.44 | 0.47 | 0.54 | 0.48 | 0.46 | 0.52 | 0.53 | | | | | | | | | | |
| 1504 | 0.50 | 0.47 | 0.47 | 0.43 | 0.47 | 0.56 | 0.52 | 0.52 | 0.60 | 0.49 | 0.50 | 0.50 | 0.43 | 0.54 | 0.51 | | | | | | | | |
| 1505 | 0.60 | 0.44 | 0.66 | 0.56 | 0.61 | 0.62 | 0.60 | 0.66 | 0.55 | 0.65 | 0.54 | 0.61 | 0.62 | 0.66 | 0.60 | 0.60 | | | | | | | |
| 1506 | 0.53 | 0.54 | 0.58 | 0.53 | 0.43 | 0.52 | 0.51 | 0.55 | 0.52 | 0.55 | 0.60 | 0.49 | 0.49 | 0.64 | 0.48 | | | | | | | | |
| 1507 | 0.56 | 0.59 | 0.52 | 0.55 | 0.47 | 0.57 | 0.65 | 0.44 | 0.67 | 1.00 | 0.46 | 0.46 | 0.53 | 0.53 | 0.46 | 0.59 | 0.49 | | | | | | |
| 1508 | 0.60 | 0.61 | 0.63 | 0.57 | 0.64 | 0.64 | 0.59 | 0.58 | 0.63 | 0.54 | 0.55 | 0.64 | 0.60 | 0.57 | | | | | | | | | |
| 1509 | 0.61 | 0.55 | 0.54 | 0.62 | 0.72 | 0.60 | 0.66 | 0.58 | 0.66 | 0.66 | 0.50 | 0.60 | 0.66 | | | | | | | | | | |
| 1510 | 0.50 | 0.57 | 0.50 | 0.60 | 0.48 | 0.53 | 0.44 | 0.51 | 0.45 | 0.48 | 0.54 | 0.50 | 0.48 | 0.44 | | | | | | | | | |
| 1511 | 0.63 | 0.71 | 0.63 | 0.65 | 0.61 | 0.61 | 0.70 | 0.63 | 0.59 | 0.65 | 0.53 | 0.58 | 0.72 | 0.58 | | | | | | | | | |
| 1512 | 0.50 | 0.48 | 0.46 | 0.47 | 0.53 | 0.46 | 0.45 | 0.45 | 0.49 | 0.59 | 0.58 | 0.58 | 0.49 | 0.53 | | | | | | | | | |
| 1513 | 0.55 | 0.57 | 0.60 | 0.64 | 0.45 | 0.57 | 0.55 | 0.61 | 0.53 | 0.58 | 0.52 | 0.45 | 0.46 | 0.57 | | | | | | | | | |
| 1514 | 0.46 | 0.57 | 0.46 | 0.42 | 0.46 | 0.47 | 0.57 | 0.43 | 0.40 | 0.42 | 0.44 | 0.47 | 0.41 | | | | | | | | | | |
| 1515 | 0.52 | 0.52 | 0.45 | 0.64 | 0.57 | 0.53 | 0.54 | 0.55 | 0.46 | 0.45 | 0.50 | 0.49 | 0.47 | 0.48 | 0.61 | 0.55 | | | | | | | |
| 1516 | 0.52 | 0.56 | 0.46 | 0.65 | 0.51 | 0.59 | 0.50 | 0.54 | 0.49 | 0.53 | 0.37 | 0.52 | 0.63 | 0.49 | 0.43 | | | | | | | | |
| 1517 | 0.59 | 0.47 | 0.54 | 0.67 | 0.57 | 0.79 | 0.59 | 0.67 | 0.55 | 0.53 | 0.57 | 0.67 | 0.67 | 0.59 | 0.51 | 0.51 | | | | | | | |
| 1518 | 0.55 | 0.59 | 0.45 | 0.57 | 0.56 | 0.67 | 0.54 | 0.48 | 0.47 | 0.48 | 0.54 | 0.61 | 0.51 | 0.64 | | | | | | | | | |
| 1519 | 0.56 | 0.49 | 0.51 | 0.50 | 0.58 | 0.55 | 0.57 | 0.48 | 0.56 | 0.54 | 0.58 | 0.52 | 0.74 | 0.60 | 0.56 | | | | | | | | |
| 1520 | 0.60 | 0.63 | 0.62 | 0.57 | 0.70 | 0.54 | 0.65 | 0.56 | 0.72 | 0.61 | 0.60 | 0.53 | 0.56 | 0.52 | | | | | | | | | |
| 1522 | 0.54 | 0.53 | 0.59 | 0.65 | 0.52 | 0.51 | 0.54 | 0.58 | 0.48 | 0.50 | 0.54 | 0.50 | 0.48 | | | | | | | | | | |
| 1523 | 0.50 | 0.51 | 0.52 | 0.57 | 0.57 | 0.52 | 0.53 | 0.45 | 0.49 | 0.45 | 0.52 | 0.47 | 0.52 | 0.44 | | | | | | | | | |
| 1524 | 0.46 | 0.41 | 0.40 | 0.44 | 0.49 | 0.50 | 0.36 | 0.58 | 0.41 | 0.42 | 0.44 | 0.47 | 0.63 | 0.47 | 0.44 | | | | | | | | |

| Females | Individual Litter Weights<br>Placental Weights (g) | Appendix I |
|---|---|---|

| Animal Number | Weights Mean | Fetus 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | | | | | | | | | | | | | | | | | | |
| 2525 | 0.42 | 0.39 | 0.50 | 0.43 | 0.50 | 0.36 | 0.43 | 0.46 | 0.39 | 0.31 | 0.45 | 0.44 | 0.46 | 0.29 | 0.43 | 0.46 | | | | | | | |
| 2526 | 0.45 | 0.45 | 0.46 | 0.49 | 0.56 | 0.41 | 0.39 | 0.39 | 0.48 | 0.45 | 0.37 | 0.43 | 0.51 | 0.45 | 0.50 | 0.39 | | | | | | | |
| 2527 | 0.64 | 0.61 | 0.66 | 0.69 | 0.58 | 0.59 | 0.73 | 0.55 | 0.67 | 0.71 | 0.64 | 0.70 | 0.56 | 0.61 | 0.60 | | | | | | | | |
| 2528 | 0.52 | 0.49 | 0.55 | 0.56 | 0.53 | 0.53 | 0.54 | 0.50 | 0.51 | 0.65 | 0.50 | 0.54 | 0.49 | 0.50 | 0.37 | 0.48 | | | | | | | |
| 2529 | 0.50 | 0.41 | 0.58 | 0.55 | 0.48 | 0.49 | 0.46 | 0.41 | 0.56 | 0.59 | 0.48 | 0.44 | 0.46 | 0.63 | 0.45 | 0.44 | | | | | | | |
| 2530 | 0.58 | 0.50 | 0.54 | 0.64 | 0.59 | 0.57 | 0.60 | 0.59 | 0.55 | 0.53 | 0.66 | 0.60 | 0.64 | 0.57 | 0.53 | | | | | | | | |
| 2531 | 0.51 | 0.53 | 0.58 | 0.59 | 0.57 | 0.52 | 0.46 | 0.46 | 0.43 | 0.52 | 0.56 | 0.51 | 0.41 | 0.46 | | | | | | | | | |
| 2532 | 0.55 | 0.49 | 0.50 | 0.68 | 0.51 | 0.52 | 0.57 | 0.56 | 0.65 | 0.54 | 0.63 | 0.44 | 0.54 | 0.50 | 0.58 | | | | | | | | |
| 2533 | 0.61 | 0.76 | 0.54 | 0.55 | 0.47 | 0.58 | 0.62 | 0.66 | 0.60 | 0.52 | 0.62 | 0.63 | 0.59 | 0.71 | 0.62 | 0.68 | | | | | | | |
| 2534 | 0.65 | 0.62 | 0.66 | 0.62 | 0.67 | 0.67 | | | | | | | | | | | | | | | | | |
| 2535 | 0.55 | 0.51 | 0.47 | 0.67 | 0.59 | 0.65 | 0.58 | 0.55 | 0.49 | 0.50 | 0.45 | 0.60 | 0.60 | 0.52 | | | | | | | | | |
| 2536 | 0.59 | 0.53 | 0.59 | 0.59 | 0.62 | 0.58 | 0.61 | 0.55 | 0.59 | 0.63 | 0.61 | 0.57 | 0.58 | | | | | | | | | | |
| 2537 | 0.55 | 0.46 | 0.51 | 0.49 | 0.61 | 0.49 | 0.60 | 0.54 | 0.66 | 0.65 | 0.45 | | | | | | | | | | | | |
| 2538 | 0.53 | 0.49 | 0.53 | 0.58 | 0.48 | 0.46 | 0.55 | 0.62 | 0.60 | 0.53 | 0.56 | 0.52 | 0.50 | 0.54 | 0.49 | | | | | | | | |
| 2539 | 0.54 | 0.60 | 0.58 | 0.57 | 0.55 | 0.57 | 0.50 | 0.51 | 0.64 | 0.54 | 0.51 | 0.42 | 0.56 | 0.42 | | | | | | | | | |
| 2540 | 0.61 | 0.43 | 0.59 | 0.58 | 0.60 | 0.56 | 0.65 | 0.61 | 0.66 | 0.63 | 0.62 | 0.70 | 0.60 | 0.68 | 0.57 | | | | | | | | |
| 2541 | 0.53 | 0.52 | 0.50 | 0.45 | 0.59 | 0.49 | 0.64 | 0.54 | 0.52 | | | | | | | | | | | | | | |
| 2542 | 0.55 | 0.42 | 0.48 | 0.62 | 0.59 | 0.49 | 0.53 | 0.53 | 0.61 | 0.49 | 0.56 | 0.57 | 0.53 | 0.62 | 0.54 | 0.63 | | | | | | | |
| 2543 | 0.55 | 0.58 | 0.53 | 0.56 | 0.53 | 0.58 | 0.49 | 0.53 | 0.55 | 0.52 | 0.56 | 0.62 | 0.59 | 0.57 | 0.53 | | | | | | | | |
| 2544 | 0.44 | 0.49 | 0.49 | 0.47 | 0.42 | 0.52 | 0.43 | 0.43 | 0.41 | 0.42 | 0.50 | 0.37 | 0.39 | 0.43 | 0.37 | | | | | | | | |
| 2545 | 0.50 | 0.51 | 0.52 | 0.48 | 0.47 | 0.48 | 0.53 | 0.51 | 0.58 | 0.49 | 0.45 | 0.53 | 0.52 | 0.44 | 0.49 | | | | | | | | |
| 2546 | 0.59 | 0.64 | 0.64 | 0.63 | 0.65 | 0.54 | 0.59 | 0.51 | 0.47 | 0.54 | 0.62 | 0.69 | 0.62 | 0.62 | 0.49 | | | | | | | | |
| 2547 | 0.64 | 0.65 | 0.64 | 0.68 | 0.58 | | | | | | | | | | | | | | | | | | |
| 2548 | 0.55 | 0.56 | 0.58 | 0.49 | 0.49 | 0.47 | 0.49 | 0.51 | 0.56 | 0.56 | 0.53 | 0.66 | 0.65 | | | | | | | | | | |

| Females | Individual Litter Weights<br>Placental Weights (g) | Appendix I |
|---|---|---|

| Animal Number | Weights Mean | Fetus 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | | | | | | | | | | | | | | | | | | |
| 3549 | 0.53 | 0.55 | 0.46 | 0.57 | 0.58 | 0.49 | 0.57 | 0.57 | 0.56 | 0.55 | 0.46 | 0.54 | 0.54 | 0.50 | 0.52 | 0.50 | 0.51 | | | | | | |
| 3550 | 0.50 | 0.43 | 0.42 | 0.59 | 0.48 | 0.50 | 0.61 | 0.47 | 0.43 | 0.47 | 0.54 | 0.51 | 0.53 | 0.50 | 0.51 | | | | | | | | |
| 3551 | 0.57 | 0.60 | 0.58 | 0.54 | 0.54 | 0.69 | 0.49 | 0.53 | 0.59 | 0.56 | 0.51 | 0.61 | | | | | | | | | | | |
| 3552 | 0.54 | 0.52 | 0.57 | 0.59 | 0.67 | 0.50 | 0.51 | 0.54 | 0.50 | 0.50 | 0.56 | 0.47 | | | | | | | | | | | |
| 3553 | 0.56 | 0.54 | 0.51 | 0.57 | 0.59 | 0.52 | 0.64 | 0.64 | 0.51 | 0.58 | 0.66 | 0.56 | 0.54 | 0.57 | 0.50 | 0.53 | | | | | | | |
| 3554 | 0.53 | 0.58 | 0.42 | 0.57 | 0.46 | 0.58 | 0.47 | 0.55 | 0.48 | 0.55 | 0.55 | 0.56 | 0.56 | 0.59 | 0.43 | 0.57 | 0.52 | 0.57 | 0.5 | | | | |
| 3555 | 0.56 | 0.64 | 0.61 | 0.42 | 0.66 | 0.51 | 0.58 | 0.55 | 0.56 | 0.58 | 0.49 | | | | | | | | | | | | |
| 3556 | 0.51 | 0.62 | 0.55 | 0.38 | 0.50 | 0.58 | 0.51 | 0.55 | 0.52 | 0.53 | 0.53 | 0.53 | 0.44 | 0.50 | 0.49 | 0.43 | | | | | | | |
| 3557 | 0.51 | 0.39 | 0.57 | 0.51 | 0.51 | 0.41 | 0.55 | 0.58 | 0.41 | 0.48 | 0.45 | 0.59 | 0.58 | 0.49 | 0.61 | 0.50 | 0.50 | 0.48 | | | | | |
| 3558 | 0.47 | 0.44 | 0.46 | 0.44 | 0.45 | 0.46 | 0.47 | 0.49 | 0.44 | 0.44 | 0.47 | 0.49 | 0.51 | 0.51 | 0.53 | 0.50 | 0.41 | | | | | | |
| 3559 | 0.51 | 0.42 | 0.49 | 0.59 | 0.52 | 0.50 | 0.51 | 0.48 | 0.44 | 0.49 | 0.51 | 0.57 | 0.55 | | | | | | | | | | |
| 3560 | 0.64 | 0.64 | 0.64 | 0.64 | 0.61 | 0.70 | 0.69 | 0.65 | 0.60 | 0.64 | 0.60 | 0.69 | 0.60 | 0.60 | 0.70 | | | | | | | | |
| 3561 | 0.57 | 0.53 | 0.58 | 0.65 | 0.59 | 0.48 | 0.56 | 0.66 | 0.74 | 0.54 | 0.53 | 0.50 | 0.52 | 0.51 | | | | | | | | | |
| 3562 | 0.46 | 0.55 | 0.54 | 0.39 | 0.42 | 0.52 | 0.43 | 0.42 | 0.50 | 0.48 | 0.47 | 0.41 | 0.43 | 0.43 | | | | | | | | | |
| 3563 | 0.54 | 0.60 | 0.54 | 0.50 | 0.51 | 0.55 | 0.55 | 0.55 | 0.50 | 0.61 | 0.58 | 0.51 | 0.55 | 0.46 | 0.53 | 0.60 | | | | | | | |
| 3564 | 0.51 | 0.41 | 0.58 | 0.56 | 0.42 | 0.54 | 0.55 | 0.45 | 0.52 | 0.53 | 0.45 | 0.52 | 0.55 | 0.48 | 0.53 | | | | | | | | |
| 3565 | 0.63 | 0.74 | 0.69 | 0.67 | 0.51 | 0.66 | 0.64 | 0.57 | 0.69 | 0.54 | | | | | | | | | | | | | |
| 3566 | 0.49 | 0.50 | 0.43 | 0.45 | 0.50 | 0.41 | 0.50 | 0.56 | 0.47 | 0.43 | 0.53 | 0.51 | 0.50 | 0.45 | 0.54 | 0.51 | | | | | | | |
| 3567 | 0.53 | 0.55 | 0.51 | 0.56 | 0.58 | 0.54 | 0.59 | 0.54 | 0.50 | 0.45 | 0.50 | | | | | | | | | | | | |
| 3568 | 0.42 | 0.44 | 0.40 | 0.42 | 0.38 | 0.51 | 0.33 | 0.46 | 0.43 | 0.55 | 0.41 | 0.42 | 0.38 | 0.44 | 0.45 | 0.35 | | | | | | | |
| 3569 | 0.53 | 0.54 | 0.52 | 0.56 | 0.55 | 0.51 | 0.53 | 0.57 | 0.60 | 0.49 | 0.51 | 0.44 | 0.48 | 0.52 | 0.53 | | | | | | | | |
| 3570 | 0.57 | 0.56 | 0.60 | 0.60 | 0.57 | 0.60 | 0.56 | 0.52 | 0.84 | 0.51 | 0.54 | 0.46 | 0.55 | 0.57 | 0.65 | 0.57 | 0.55 | 0.45 | | | | | |
| 3571 | 0.51 | 0.47 | 0.50 | 0.49 | 0.56 | 0.46 | 0.54 | 0.57 | 0.49 | 0.57 | 0.52 | 0.41 | 0.50 | 0.49 | | | | | | | | | |
| 3572 | 0.46 | 0.39 | 0.50 | 0.49 | 0.41 | 0.42 | 0.49 | 0.44 | 0.41 | 0.39 | 0.42 | 0.53 | 0.51 | 0.52 | | | | | | | | | |

| Females | Individual Litter Weights<br>Placental Weights (g) | Appendix I |
|---|---|---|

| Animal Number | Weights Mean | Fetus 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | | | | | | | | | | | | | | | | | | | |
| 4573 | 0.56 | 0.51 | 0.70 | 0.56 | 0.64 | 0.47 | 0.52 | 0.60 | 0.53 | 0.35 | 0.59 | 0.63 | 0.60 | 0.55 | | | | | | | | | |
| 4574 | 0.37 | 0.42 | 0.35 | 0.37 | 0.40 | 0.39 | 0.34 | 0.31 | 0.39 | 0.37 | 0.42 | 0.34 | 0.43 | 0.36 | 0.37 | 0.36 | | | | | | | |
| 4575 | 0.51 | 0.50 | 0.53 | 0.54 | 0.48 | 0.48 | 0.62 | 0.51 | 0.51 | 0.52 | 0.58 | 0.46 | 0.53 | 0.57 | 0.53 | 0.43 | 0.40 | 0.51 | | | | | |
| 4576 | 0.52 | 0.55 | 0.42 | 0.61 | 0.51 | 0.50 | 0.52 | 0.62 | 0.51 | 0.46 | 0.52 | 0.51 | 0.54 | | | | | | | | | | |
| 4577 | 0.55 | 0.39 | 0.41 | 0.47 | 0.53 | 0.59 | 0.55 | 0.53 | 0.40 | 0.58 | 0.76 | 0.52 | 0.55 | 0.92 | | | | | | | | | |
| 4578 | 0.60 | 0.55 | 0.51 | 0.63 | 0.62 | 0.61 | 0.56 | 0.84 | 0.60 | 0.61 | 0.49 | 0.63 | 0.54 | 0.61 | | | | | | | | | |
| 4579 | 0.47 | 0.57 | 0.48 | 0.45 | 0.51 | 0.38 | 0.57 | 0.44 | 0.36 | 0.49 | 0.43 | 0.47 | 0.44 | 0.49 | 0.46 | | | | | | | | |
| 4580 | 0.53 | 0.51 | 0.52 | 0.47 | 0.54 | 0.53 | 0.56 | 0.49 | 0.56 | 0.53 | 0.54 | 0.54 | 0.58 | 0.49 | | | | | | | | | |
| 4581 | 0.58 | 0.50 | 0.49 | 0.59 | 0.77 | 0.71 | 0.56 | 0.58 | 0.60 | 0.52 | 0.57 | 0.57 | 0.56 | 0.51 | | | | | | | | | |
| 4582 | 0.78 | 0.89 | 0.67 | | | | | | | | | | | | | | | | | | | | |
| 4583 | 0.90 | 0.90 | | | | | | | | | | | | | | | | | | | | | |
| 4584 | 0.49 | 0.47 | 0.41 | 0.54 | 0.54 | 0.52 | 0.51 | 0.48 | 0.53 | 0.43 | 0.48 | 0.49 | 0.46 | 0.52 | 0.54 | | | | | | | | |
| 4585 | 0.53 | 0.57 | 0.50 | 0.56 | 0.57 | 0.57 | 0.56 | 0.48 | 0.50 | 0.56 | 0.51 | 0.50 | 0.50 | | | | | | | | | | |
| 4586 | 0.58 | 0.52 | 0.49 | 0.58 | 0.52 | 0.69 | 0.60 | 0.69 | 0.59 | 0.52 | 0.61 | 0.57 | 0.60 | 0.64 | 0.49 | | | | | | | | |
| 4587 | 0.62 | 0.56 | 0.63 | 0.68 | 0.67 | 0.65 | 0.67 | 0.61 | 0.68 | 0.68 | 0.58 | 0.59 | 0.59 | 0.50 | 0.63 | 0.64 | | | | | | | |
| 4588 | 0.55 | 0.55 | 0.59 | 0.52 | 0.62 | 0.52 | 0.48 | 0.58 | 0.48 | 0.62 | 0.56 | 0.53 | 0.66 | 0.54 | 0.50 | 0.46 | | | | | | | |
| 4589 | 0.53 | 0.51 | 0.54 | 0.47 | 0.65 | 0.47 | 0.68 | 0.49 | 0.50 | 0.52 | 0.55 | 0.49 | 0.52 | 0.54 | 0.45 | 0.49 | 0.57 | 0.58 | | | | | |
| 4590 | 0.52 | 0.50 | 0.50 | 0.43 | 0.66 | 0.33 | 0.59 | 0.60 | 0.55 | 0.58 | 0.60 | 0.41 | 0.55 | 0.52 | | | | | | | | | |
| 4591 | 0.57 | 0.56 | 0.49 | 0.58 | 0.57 | 0.48 | 0.54 | 0.58 | 0.53 | 0.55 | 0.54 | 0.85 | 0.47 | 0.63 | 0.54 | | | | | | | | |
| 4593 | 0.55 | 0.61 | 0.56 | 0.55 | 0.63 | 0.48 | 0.56 | 0.50 | 0.50 | 0.56 | 0.54 | | | | | | | | | | | | |
| 4594 | 0.51 | 0.59 | 0.56 | 0.51 | 0.54 | 0.44 | 0.54 | 0.47 | 0.48 | 0.49 | 0.56 | 0.41 | 0.54 | 0.51 | 0.47 | 0.48 | | | | | | | |
| 4595 | 0.47 | 0.38 | 0.55 | 0.47 | 0.42 | 0.46 | 0.47 | 0.49 | 0.45 | 0.39 | 0.55 | 0.45 | 0.45 | 0.54 | 0.49 | 0.42 | | | | | | | |
| 4596 | 0.59 | 0.60 | 0.78 | 0.60 | 0.63 | 0.54 | 0.55 | 0.57 | 0.60 | 0.61 | 0.61 | 0.52 | 0.51 | | | | | | | | | | |

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 1 – 0 mg/m3 | | | | | | |
| 1501 | 8s, 8v | 1 | F | 3.6 | s | No abnormality detected |
| | | 2 | F | 3.8 | v | No abnormality detected |
| | | 3 | M | 4.1 | s | No abnormality detected |
| | | 4 | M | 4.0 | v | Liver: median liver lobe, additional |
| | | 5 | M | 3.9 | s | No abnormality detected |
| | | 6 | F | 3.5 | v | No abnormality detected |
| | | 7 | M | 4.0 | s | *Head bones: frontal, bilateral, incompletely ossified* |
| | | 8 | M | 3.8 | v | No abnormality detected |
| | | 9 | F | 3.4 | s | *Limb bones, metacarpal, 5th digit, bilateral, unossified* |
| | | 10 | F | 3.4 | v | No abnormality detected |
| | | 11 | M | 3.7 | s | No abnormality detected |
| | | 12 | F | 3.6 | v | No abnormality detected |
| | | 13 | M | 4.1 | s | No abnormality detected |
| | | 14 | M | 4.0 | v | No abnormality detected |
| | | 15 | M | 3.7 | s | No abnormality detected |
| | | 16 | F | 3.4 | v | No abnormality detected |
| 1502 | 6s, 7v | 1 | F | 3.6 | v | No abnormality detected |
| | | 2 | F | 3.9 | s | No abnormality detected |
| | | 3 | F | 3.7 | v | Liver: median liver lobe, additional |
| | | 4 | M | 3.9 | s | No abnormality detected |
| | | 5 | M | 4.2 | v | Cervical: thymus gland, left, partially undescended |
| | | 6 | F | 3.8 | s | No abnormality detected |
| | | 7 | M | 4.2 | v | No abnormality detected |

s = skeletal; v = visceral

Individual Fetal Observations | Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | |
| 1502 | 6s, 7v | 8 | M | 4.1 | s | No abnormality detected |
| | | 9 | M | 4.0 | v | Liver: median liver lobe, additional |
| | | 10 | M | 4.2 | s | No abnormality detected |
| | | 11 | F | 4.3 | v | Head: cranial region, subcutaneous, hemorrhage(s) |
| | | 12 | F | 4.1 | s | *Head bones: interparietal, incompletely ossified*<br>*Head bones: parietal, left, incompletely ossified*<br>*Variants: sternebra(e), 5th, incompletely ossified* |
| | | 13 | F | 3.7 | v | No abnormality detected |
| 1503 | 6s, 6v | 1 | M | 3.6 | s | *Girdles: ischium, bilateral, incompletely ossified*<br>*Girdles: pubis, bilateral, incompletely ossified*<br>*Variants: sternebra(e), 5th, incompletely ossified* |
| | | 2 | F | 3.3 | v | No abnormality detected |
| | | 3 | M | 3.9 | s | *Girdles: ischium, bilateral, incompletely ossified*<br>*Head bones: supraoccipital, incompletely ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 1st, asymmetrically ossified*<br>*Variants: sternebra(e), 5th, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 4 | F | 4.0 | v | Liver: median liver lobe, additional<br>Abdomen: abdominal cavity, hemorrhage(s) |
| | | 5 | F | 3.9 | s | No abnormality detected |
| | | 6 | M | 3.4 | v | No abnormality detected |
| | | 7 | F | 3.5 | s | *Thoracic vert.: thoracic vert. centrum(a), 1st, unossified*<br>*Variants: sternebra(e), 5th, unossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | |
| 1503 | 6s, 6v | 7 | F | 3.5 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 8 | M | 3.8 | v | No abnormality detected |
| | | 9 | F | 3.7 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 10 | F | 3.4 | v | No abnormality detected |
| | | 11 | M | 3.8 | s | No abnormality detected |
| | | 12 | M | 4.2 | v | No abnormality detected |
| 1504 | 7s, 7v | 1 | M | 3.7 | v | No abnormality detected |
| | | 2 | M | 4.3 | s | Limb bones: phalanx, 4 ossified |
| | | 3 | M | 3.6 | v | No abnormality detected |
| | | 4 | F | 3.9 | s | Limb bones: phalanx, 4 ossified |
| | | 5 | M | 4.7 | v | Abdomen: abdominal cavity, hemorrhage(s) |
| | | 6 | F | 4.0 | s | Limb bones: phalanx, 4 ossified |
| | | 7 | F | 4.4 | v | No abnormality detected |
| | | 8 | M | 4.1 | s | Cervical vert.: cervical vert. centrum(a), 5 ossified<br>Limb bones: phalanx, 4 ossified |
| | | 9 | F | 3.9 | v | No abnormality detected |
| | | 10 | M | 4.4 | s | Limb bones: phalanx, 4 ossified |
| | | 11 | M | 4.4 | v | Abdomen: abdominal cavity, hemorrhage(s) |
| | | 12 | F | 4.2 | s | Cervical vert.: cervical vert. centrum(a), 5 ossified<br>Limb bones: phalanx, 4 ossified |
| | | 13 | M | 4.6 | v | Brain: cerebellum, subdural, hemorrhage(s)<br>Abdomen: abdominal cavity, hemorrhage(s) |
| | | 14 | M | 4.5 | s | Limb bones: phalanx, 4 ossified |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | |
| 1505 | 8s, 7v | 1 | M | 2.8 | s | *Variants: sternebra(e), 5th, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 2 | F | 3.7 | v | Brain: cerebellum, subdural, hemorrhage(s)<br>Cervical: thymus gland, bilateral, partially undescended |
| | | 3 | F | 2.8 | s | *Caudal vertebrae: caudal vertebral arch(es), 2nd, bilateral, unossified*<br>*Girdles: pubis, bilateral, incompletely ossified*<br>*Head bones: interparietal, incompletely ossified*<br>*Lumbar vertebrae: lumbar vertebral centrum(a), 3rd, incompletely ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 11th, bipartite ossified* |
| | | 4 | F | 3.6 | v | No abnormality detected |
| | | 5 | M | 3.6 | s | *Thoracic vert.: thoracic vert. centrum(a), 12th, dumbbell ossified* |
| | | 6 | F | 3.5 | v | Abdomen: abdominal cavity, hemorrhage(s) |
| | | 7 | M | 3.8 | s | *Thoracic vert.: thoracic vert. centrum(a), 10th, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 8 | F | 3.6 | v | No abnormality detected |
| | | 9 | M | 3.6 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 10 | F | 3.1 | v | No abnormality detected |
| | | 11 | F | 3.8 | s | No abnormality detected |
| | | 12 | M | 3.5 | v | No abnormality detected |
| | | 13 | M | 3.9 | s | No abnormality detected |
| | | 14 | F | 3.7 | v | No abnormality detected |
| | | 15 | F | 3.1 | s | *Lumbar vertebrae: lumbar vertebral centrum(a), 1st, dumbbell ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 10th-13th, dumbbell ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 11th, incompletely ossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | |
| 1505 | 8s, 7v | 15 | F | 3.1 | s | *Variants: sternebra(e), 2nd, incompletely ossified*<br>*Variants: sternebra(e), 4th, incompletely ossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| 1506 | 7s, 7v | 1 | F | 4.1 | v | Head: cranial region, subcutaneous, hemorrhage(s) |
| | | 2 | F | 4.2 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 3 | F | 4.2 | v | No abnormality detected |
| | | 4 | F | 4.3 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 5 | F | 4.1 | v | No abnormality detected |
| | | 6 | F | 4.2 | s | Cervical vert.: cervical vertebral arch(es), 3rd-7th, ossified center |
| | | 7 | F | 4.2 | v | No abnormality detected |
| | | 8 | F | 4.0 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 9 | M | 4.4 | v | No abnormality detected |
| | | 10 | M | 4.2 | s | Cervical vert.: cervical vertebral arch(es), 3rd-7th, ossified center |
| | | 11 | M | 4.7 | v | No abnormality detected |
| | | 12 | M | 4.4 | s | Cervical vert.: cervical vertebral arch(es), 3rd-7th, ossified center |
| | | 13 | F | 3.9 | v | Head: cranial region, subcutaneous, hemorrhage(s)<br>Limbs: left forelimb, hemorrhage(s) |
| | | 14 | F | 4.1 | s | *Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| 1507 | 8s, 8v | 1 | F | 3.7 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 2 | M | 4.0 | v | No abnormality detected |

Individual Fetal Observations | Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | |
| 1507 | 8s, 8v | 3 | M | 4.0 | s | No abnormality detected |
| | | 4 | M | 4.2 | v | No abnormality detected |
| | | 5 | M | 4.1 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 6 | F | 3.8 | v | No abnormality detected |
| | | 7 | M | 3.9 | s | No abnormality detected |
| | | 8 | M | 4.1 | v | Kidney/ureter: renal pelvis, left, dilated |
| | | 9 | M | 3.6 | s | *Head bones: hyoid body, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 10 | F | 3.6 | v | No abnormality detected |
| | | 11 | M | 3.7 | s | No abnormality detected |
| | | 12 | F | 3.9 | v | No abnormality detected |
| | | 13 | M | 4.5 | s | No abnormality detected |
| | | 14 | F | 4.1 | v | No abnormality detected |
| | | 15 | M | 4.1 | s | No abnormality detected |
| | | 16 | F | 3.7 | v | Abdomen: abdominal cavity, hemorrhage(s) |
| 1508 | 6s, 7v | 1 | F | 3.7 | v | Liver: median liver lobe, additional |
| | | 2 | M | 4.4 | s | *Head bones: hyoid body, unossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 11th, dumbbell ossified* |
| | | 3 | F | 3.8 | v | No abnormality detected |
| | | 4 | M | 4.1 | s | *Girdles: pubis, bilateral, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 5 | F | 4.0 | v | Kidney/ureter: renal pelvis, bilateral, dilated |
| | | 6 | F | 3.7 | s | *Head bones: squamosal, left, incompletely ossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations | Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | |
| 1508 | 6s, 7v | 6 | F | 3.7 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | | | | | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 7 | M | 4.1 | v | No abnormality detected |
| | | 8 | M | 4.5 | s | No abnormality detected |
| | | 9 | F | 4.3 | v | No abnormality detected |
| | | 10 | F | 4.1 | s | *Variants: sternebra(e), 5th, unossified* |
| | | 11 | F | 4.2 | v | No abnormality detected |
| | | 12 | F | 4.0 | s | Variants: 14th rib, bilateral, short |
| | | 13 | F | 4.0 | v | No abnormality detected |
| 1509 | 6s, 6v | 1 | F | 4.2 | s | Cervical vert.: cervical vert. centrum(a), 6 ossifed |
| | | | | | | Variants: 14th rib, bilateral, short |
| | | 2 | M | 4.2 | v | Abdomen: testis, left, malpositioned |
| | | 3 | M | 4.6 | s | Limb bones: phalanx, 2 ossified |
| | | 4 | F | 4.3 | v | No abnormality detected |
| | | 5 | M | 4.3 | s | Cervical vert.: cervical vert. centrum(a), 6 ossifed |
| | | | | | | Variants: 14th rib, bilateral, short |
| | | 6 | M | 4.0 | v | Thorax: innominate artery, short |
| | | 7 | F | 4.7 | s | No abnormality detected |
| | | 8 | F | 4.3 | v | No abnormality detected |
| | | 9 | M | 4.5 | s | No abnormality detected |
| | | 10 | M | 4.3 | v | Abdomen: abdominal cavity, hemorrhage(s) |
| | | 11 | M | 4.6 | s | Variants: 14th rib, left, short |
| | | 12 | M | 4.5 | v | No abnormality detected |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | |
| 1510 | 6s, 7v | 1 | M | 3.7 | v | No abnormality detected |
| | | 2 | M | 3.5 | s | *Head bones: hyoid body, unossified*<br>*Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Variants: sternebra(e), 5th, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 3 | F | 3.7 | v | No abnormality detected |
| | | 4 | F | 2.9 | s | *Head bones: hyoid body, unossified*<br>*Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>Variants: 14th rib, left, short<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, unossified* |
| | | 5 | F | 3.7 | v | No abnormality detected |
| | | 6 | F | 3.5 | s | *Girdles: pubis, bilateral, incompletely ossified*<br>*Head bones: hyoid body, unossified*<br>*Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 7 | F | 3.4 | v | No abnormality detected |
| | | 8 | F | 3.8 | s | *Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Sacral vertebrae: sacrocaudal vert. arch(es), incompletely ossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 9 | M | 3.9 | v | No abnormality detected |
| | | 10 | M | 3.7 | s | *Girdles: pubis, bilateral, incompletely ossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | |
| 1510 | 6s, 7v | 10 | M | 3.7 | s | *Head bones: interparietal, incompletely ossified*<br>*Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Sacral vertebrae: sacrocaudal vert. arch(es), incompletely ossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 11 | M | 3.4 | v | No abnormality detected |
| | | 12 | M | 3.8 | s | *Girdles: pubis, right, incompletely ossified*<br>*Head bones: hyoid body, unossified*<br>*Sacral vertebrae: sacrocaudal vert. arch(es), incompletely ossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 13 | M | 4.0 | v | No abnormality detected |
| 1511 | 7s, 6v | 1 | F | 3.8 | s | *Sacral vertebrae: sacrocaudal vert. arch(es), incompletely ossified*<br>*Variants: sternebra(e), 5th, unossified* |
| | | 2 | M | 4.1 | v | No abnormality detected |
| | | 3 | F | 3.9 | s | *Thoracic vert.: thoracic vert. centrum(a), 11th, dumbbell ossified* |
| | | 4 | F | 4.1 | v | No abnormality detected |
| | | 5 | F | 3.7 | s | *Head bones: hyoid body, unossified*<br>*Limb bones, metacarpal, 5th digit, left, unossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 8th, dumbbell ossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 6 | M | 4.3 | v | No abnormality detected |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations | Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | |
| 1511 | 7s, 6v | 7 | M | 4.3 | s | No abnormality detected |
| | | 8 | M | 4.1 | v | No abnormality detected |
| | | 9 | F | 4.0 | s | No abnormality detected |
| | | 10 | M | 4.3 | v | Liver: median liver lobe, additional |
| | | 11 | M | 4.0 | s | No abnormality detected |
| | | 12 | M | 4.1 | v | No abnormality detected |
| | | 13 | F | 3.8 | s | *Girdles: pubis, bilateral, incompletely ossified* |
| 1512 | 6s, 7v | 1 | F | 3.8 | v | Liver: median liver lobe, additional |
| | | 2 | F | 4.0 | s | No abnormality detected |
| | | 3 | F | 4.0 | v | No abnormality detected |
| | | 4 | F | 4.2 | s | Limb bones: phalanx, 1 ossified<br>*Thoracic vert.: thoracic vert. centrum(a), 12th, dumbbell ossified* |
| | | 5 | F | 3.8 | v | No abnormality detected |
| | | 6 | F | 4.0 | s | Girdles: pelvic girdle, (left sided), unilateral caudal shift<br>Limb bones: phalanx, 1 ossified |
| | | 7 | F | 4.0 | v | No abnormality detected |
| | | 8 | F | 4.0 | s | Limb bones: phalanx, 1 ossified<br>*Variants: sternebra(e), 5th, incompletely ossified* |
| | | 9 | F | 3.9 | v | Liver: median liver lobe, additional |
| | | 10 | F | 4.0 | s | Limb bones: phalanx, 1 ossified<br>*Variants: sternebra(e), 5th, incompletely ossified* |
| | | 11 | M | 4.3 | v | No abnormality detected |
| | | 12 | F | 3.8 | s | No abnormality detected |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | |
| 1512 | 6s, 7v | 13 | F | 3.8 | v | No abnormality detected |
| 1513 | 7s, 6v | 1 | M | 3.8 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 2 | F | 4.1 | v | No abnormality detected |
| | | 3 | M | 3.5 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 4 | F | 4.2 | v | Liver: median liver lobe, additional |
| | | 5 | M | 4.0 | s | No abnormality detected |
| | | 6 | M | 4.1 | v | No abnormality detected |
| | | 7 | M | 3.9 | s | *Head bones: parietal, right, incompletely ossified*<br>*Head bones: squamosal, right, incompletely ossified*<br>*Sacral vertebrae: sacrocaudal vert. arch(es), incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 8 | M | 4.1 | v | No abnormality detected |
| | | 9 | F | 4.0 | s | Cervical vert.: cervical vert. centrum(a), 5 ossified<br>Limb bones: phalanx, 4 ossified |
| | | 10 | F | 3.7 | v | No abnormality detected |
| | | 11 | M | 3.9 | s | Cervical vert.: cervical vert. centrum(a), 5 ossified<br>*Head bones: hyoid body, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 12 | F | 3.6 | v | No abnormality detected |
| | | 13 | M | 4.1 | s | *Head bones: hyoid body, unossified*<br>*Head bones: interparietal, incompletely ossified*<br>*Head bones: jugal, bilateral, incompletely ossified*<br>*Head bones: parietal, right, incompletely ossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | |
| 1513 | 7s, 6v | 13 | M | 4.1 | s | *Head bones: presphenoid, incompletely ossified*<br>*Head bones: squamosal, right, incompletely ossified*<br>*Head bones: supraoccipital, incompletely ossified*<br>*Sacral vertebrae: sacrocaudal vert. arch(es), incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| 1514 | 6s, 6v | 1 | M | 2.3 | v | Head: cranial region, subcutaneous, hemorrhage(s)<br>Skin/subcutis: head, right, subcutaneous hemorrhage<br>Whole body: whole body, subcutaneous, hemorrhage |
| | | 2 | F | 2.3 | s | *Cervical vert.: cervical vertebral arch(es), 3rd-7th, bilateral, incompletely ossified*<br>*Girdles: pubis, bilateral, unossified*<br>*Head bones: presphenoid, incompletely ossified*<br>*Head bones: supraoccipital, incompletely ossified*<br>*Limb bones, metacarpal, 2nd digit, bilateral, incompletely ossified*<br>*Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Sacral vertebrae: sacrocaudal vert. arch(es), incompletely ossified*<br>Skin/subcutis: forelimb(s), right, subcutaneous hemorrhage<br>*Sternebrae: sternebral center(s), 2nd, incompletely ossified*<br>*Sternebrae: sternebral center(s), 4th, incompletely ossified*<br>*Variants: sternebra(e), 5th, incompletely ossified*<br>*Variants: sternebra(e), 6th, unossified* |
| | | 3 | F | 2.4 | v | No abnormality detected |
| | | 4 | F | 2.4 | s | *Cervical vert.: cervical vertebral arch(es), 3rd-7th, bilateral, incompletely ossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | |
| 1514 | 6s, 6v | 4 | F | 2.4 | s | *Girdles: pubis, bilateral, unossified*<br>*Head bones: supraoccipital, incompletely ossified*<br>*Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Sacral vertebrae: sacrocaudal vert. arch(es), incompletely ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 1st, unossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, unossified* |
| | | 5 | M | 2.5 | v | Kidney/ureter: renal papilla, left, small<br>Kidney/ureter: ureter, left, dilated<br>Liver: median liver lobe, additional |
| | | 6 | M | 2.6 | s | *Girdles: pubis, bilateral, incompletely ossified*<br>*Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, unossified* |
| | | 7 | F | 2.5 | v | No abnormality detected |
| | | 8 | F | 2.3 | s | *Cervical vert.: cervical vertebral arch(es), 3rd-7th, bilateral, incompletely ossified*<br>*Girdles: pubis, left, unossified*<br>*Girdles: pubis, right, incompletely ossified*<br>*Head bones: presphenoid, incompletely ossified*<br>*Head bones: supraoccipital, incompletely ossified*<br>*Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Sacral vertebrae: sacrocaudal vert. arch(es), incompletely ossified*<br>*Sternebrae: sternebral center(s), 2nd, incompletely ossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | |
| 1514 | 6s, 6v | 8 | F | 2.3 | s | *Sternebrae: sternebral center(s), 4th, incompletely ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 1st, unossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, unossified* |
| | | 9 | M | 2.3 | v | No abnormality detected |
| | | 10 | M | 2.5 | s | *Cervical vert.: cervical vertebral arch(es), 3rd-7th, bilateral, incompletely ossified*<br>*Girdles: pubis, bilateral, incompletely ossified*<br>*Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Sacral vertebrae: sacrocaudal vert. arch(es), incompletely ossified*<br>*Sternebrae: sternebral center(s), 2nd, incompletely ossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, unossified* |
| | | 11 | M | 2.2 | v | Limbs: bilateral hind limb, subcutaneous, hemorrhage(s) |
| | | 12 | F | 2.2 | s | *Cervical vert.: cervical vertebral arch(es), 3rd-7th, bilateral, incompletely ossified*<br>*Girdles: pubis, bilateral, incompletely ossified*<br>*Head bones: supraoccipital, incompletely ossified*<br>*Limb bones, metacarpal, 2nd digit, bilateral, incompletely ossified*<br>*Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Sacral vertebrae: sacrocaudal vert. arch(es), incompletely ossified*<br>*Sternebrae: sternebral center(s), 4th, incompletely ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 1st, unossified*<br>*Variants: sternebra(e), 5th, unossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations | Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | |
| 1514 | 6s, 6v | 12 | F | 2.2 | s | *Variants: sternebra(e), 6th, unossified* |
| 1515 | 8s, 7v | 1 | F | 3.9 | s | *Variants: sternebra(e), 5th, unossified* |
| | | 2 | F | 3.9 | v | Liver: median liver lobe, additional |
| | | 3 | M | 4.5 | s | Cervical vert.: cervical vert. centrum(a), 2nd-7th, ossified center |
| | | 4 | F | 4.1 | v | No abnormality detected |
| | | 5 | M | 4.3 | s | *Thoracic vert.: thoracic vert. centrum(a), 12th, incompletely ossified* |
| | | 6 | F | 4.0 | v | No abnormality detected |
| | | 7 | F | 3.9 | s | *Head bones: hyoid body, unossified*<br>*Variants: sternebra(e), 5th, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 8 | F | 4.0 | v | No abnormality detected |
| | | 9 | F | 3.6 | s | *Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 10 | F | 3.8 | v | Abdomen: abdominal cavity, hemorrhage(s) |
| | | 11 | F | 3.9 | s | *Variants: sternebra(e), 5th, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 12 | M | 3.8 | v | No abnormality detected |
| | | 13 | M | 4.2 | s | No abnormality detected |
| | | 14 | M | 4.1 | v | No abnormality detected |
| | | 15 | F | 3.8 | s | No abnormality detected |
| 1516 | 7s, 7v | 1 | F | 3.5 | v | Brain: medulla oblongata, bilateral, hemorrhage(s) |
| | | 2 | F | 3.9 | s | No abnormality detected |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | |
| 1516 | 7s, 7v | 3 | M | 4.0 | v | No abnormality detected |
| | | 4 | F | 3.7 | s | *Head bones: hyoid body, unossified* |
| | | 5 | M | 3.6 | v | No abnormality detected |
| | | 6 | M | 3.7 | s | Girdles: pubis, right, fissure<br>*Thoracic vert.: thoracic vert. centrum(a), 10th, dumbbell ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 7 | M | 3.7 | v | No abnormality detected |
| | | 8 | F | 3.7 | s | *Head bones: hyoid body, unossified*<br>*Head bones: squamosal, right, incompletely ossified*<br>*Variants: sternebra(e), 5th, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 9 | F | 3.5 | v | No abnormality detected |
| | | 10 | F | 3.4 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 11 | F | 3.6 | v | No abnormality detected |
| | | 12 | M | 3.9 | s | No abnormality detected |
| | | 13 | M | 3.8 | v | No abnormality detected |
| | | 14 | F | 3.5 | s | *Thoracic vert.: thoracic vert. centrum(a), 9th-11th, dumbbell ossified*<br>*Variants: sternebra(e), 5th, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| 1517 | 8s, 7v | 1 | F | 3.8 | s | *Girdles: ischium, right, incompletely ossified*<br>*Girdles: pubis, right, incompletely ossified*<br>*Head bones: hyoid body, unossified*<br>*Variants: sternebra(e), 5th, unossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | |
| 1517 | 8s, 7v | 2 | F | 3.5 | v | No abnormality detected |
| | | 3 | M | 4.2 | s | *Head bones: hyoid body, unossified* |
| | | 4 | M | 4.1 | v | No abnormality detected |
| | | 5 | M | 4.0 | s | *Head bones: hyoid body, unossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 6 | M | 3.9 | v | Liver: median liver lobe, additional<br>Thorax: diaphragm, small, thinning, with liver protrusion(s) |
| | | 7 | F | 4.0 | s | *Variants: sternebra(e), 5th, unossified* |
| | | 8 | M | 4.1 | v | Liver: median liver lobe, additional |
| | | 9 | M | 4.1 | s | No abnormality detected |
| | | 10 | F | 3.5 | v | No abnormality detected |
| | | 11 | M | 4.0 | s | No abnormality detected |
| | | 12 | F | 4.0 | v | No abnormality detected |
| | | 13 | F | 3.3 | s | No abnormality detected |
| | | 14 | F | 3.8 | v | No abnormality detected |
| | | 15 | F | 3.4 | s | No abnormality detected |
| 1518 | 6s, 7v | 1 | M | 3.9 | v | Liver: median liver lobe, additional |
| | | 2 | F | 3.6 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 3 | F | 3.8 | v | No abnormality detected |
| | | 4 | M | 4.3 | s | No abnormality detected |
| | | 5 | M | 4.0 | v | No abnormality detected |
| | | 6 | M | 4.1 | s | No abnormality detected |

s = skeletal; v = visceral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | |
| 1518 | 6s, 7v | 7 | M | 3.9 | v | No abnormality detected |
| | | 8 | M | 3.9 | s | No abnormality detected |
| | | 9 | F | 3.4 | v | No abnormality detected |
| | | 10 | M | 3.8 | s | *Thoracic vert.: thoracic vert. centrum(a), 11th, incompletely ossified* |
| | | 11 | F | 3.9 | v | No abnormality detected |
| | | 12 | F | 4.0 | s | No abnormality detected |
| | | 13 | F | 4.1 | v | No abnormality detected |
| 1519 | 7s, 7v | 1 | F | 3.8 | s | No abnormality detected |
| | | 2 | F | 3.9 | v | No abnormality detected |
| | | 3 | M | 4.2 | s | *Thoracic vert.: thoracic vert. centrum(a), 11th, bipartite ossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 4 | F | 4.4 | v | No abnormality detected |
| | | 5 | F | 3.9 | s | No abnormality detected |
| | | 6 | F | 4.3 | v | Head: cranial region, posterior, subdural, hemorrhage(s) |
| | | 7 | M | 4.5 | s | *Head bones: hyoid body, unossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 11th, dumbbell ossified*<br>*Variants: sternebra(e), 5th, incompletely ossified* |
| | | 8 | F | 4.1 | v | No abnormality detected |
| | | 9 | F | 4.2 | s | *Variants: sternebra(e), 5th, unossified* |
| | | 10 | M | 4.6 | v | Abdomen: abdominal cavity, hemorrhage(s) |
| | | 11 | F | 4.3 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 12 | M | 4.6 | v | No abnormality detected |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | |
| 1519 | 7s, 7v | 13 | F | 4.3 | s | No abnormality detected |
| | | 14 | F | 4.0 | v | No abnormality detected |
| 1520 | 6s, 7v | 1 | M | 3.9 | v | No abnormality detected |
| | | 2 | F | 4.1 | s | No abnormality detected |
| | | 3 | M | 3.9 | v | No abnormality detected |
| | | 4 | M | 4.1 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 5 | M | 4.4 | v | No abnormality detected |
| | | 6 | F | 3.7 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 7 | M | 4.1 | v | No abnormality detected |
| | | 8 | M | 4.1 | s | *Girdles: pubis, bilateral, incompletely ossified* |
| | | 9 | M | 3.8 | v | No abnormality detected |
| | | 10 | F | 4.0 | s | Variants: 14th rib, left, short |
| | | 11 | F | 4.0 | v | Brain: medulla oblongata, right, hemorrhage(s) |
| | | 12 | M | 4.1 | s | No abnormality detected |
| | | 13 | F | 3.5 | v | No abnormality detected |
| 1522 | 6s, 6v | 1 | F | 3.8 | v | No abnormality detected |
| | | 2 | M | 3.7 | s | *Girdles: ischium, bilateral, unossified*<br>*Girdles: pubis, bilateral, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 3 | M | 4.1 | v | No abnormality detected |
| | | 4 | F | 3.8 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 5 | F | 3.6 | v | No abnormality detected |

s = skeletal; v = visceral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | |
| 1522 | 6s, 6v | 6 | M | 4.0 | s | *Head bones: hyoid body, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 7 | M | 3.6 | v | No abnormality detected |
| | | 8 | F | 3.7 | s | *Head bones: interparietal, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 9 | F | 3.7 | v | Thorax: diaphragm, small, thinning, with liver protrusion(s) |
| | | 10 | F | 3.8 | s | *Head bones: hyoid body, unossified*<br>*Head bones: interparietal, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 11 | M | 4.0 | v | No abnormality detected |
| | | 12 | F | 3.7 | s | *Head bones: interparietal, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| 1523 | 7s, 6v | 1 | M | 4.1 | s | *Caudal vertebrae: caudal vertebral arch(es), 1st, right, unossified*<br>*Head bones: hyoid body, unossified*<br>*Head bones: interparietal, incompletely ossified*<br>*Head bones: jugal, bilateral, incompletely ossified*<br>*Head bones: parietal, bilateral, incompletely ossified*<br>*Head bones: supraoccipital, incompletely ossified*<br>*Variants: sternebra(e), 5th, unossified* |
| | | 2 | M | 4.1 | v | Cervical: thymus gland, left, partially undescended<br>Liver: median liver lobe, additional |
| | | 3 | M | 4.1 | s | *Head bones: hyoid body, unossified*<br>*Variants: sternebra(e), 5th, incompletely ossified* |

s = skeletal; v = visceral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | |
| 1523 | 7s, 6v | 3 | M | 4.1 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 4 | M | 4.0 | v | No abnormality detected |
| | | 5 | F | 3.9 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 6 | M | 3.9 | v | Abdomen: testis, right, malpositioned |
| | | 7 | M | 3.5 | s | Ribs: 13th, bilateral, short |
| | | 8 | F | 3.7 | v | No abnormality detected |
| | | 9 | M | 4.1 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 10 | M | 4.0 | v | Thorax: caudal vena cava, left hepatic vein, anomalous confluence |
| | | 11 | M | 4.5 | s | *Head bones: hyoid body, unossified* |
| | | 12 | F | 3.6 | v | No abnormality detected |
| | | 13 | F | 3.5 | s | *Variants: sternebra(e), 6th, unossified* |
| 1524 | 7s, 7v | 1 | F | 3.6 | v | No abnormality detected |
| | | 2 | M | 3.7 | s | No abnormality detected |
| | | 3 | F | 3.7 | v | No abnormality detected |
| | | 4 | M | 3.8 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 5 | F | 3.5 | v | Cervical: thymus gland, left, partially undescended |
| | | 6 | M | 3.4 | s | *Head bones: hyoid body, unossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 7 | M | 3.9 | v | No abnormality detected |
| | | 8 | M | 3.6 | s | *Head bones: hyoid body, unossified*<br>*Variants: sternebra(e), 5th, incompletely ossified* |
| | | 9 | F | 3.7 | v | No abnormality detected |

s = skeletal; v = visceral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m3 | | | | | | |
| 1524 | 7s, 7v | 10 | M | 4.1 | s | No abnormality detected |
| | | 11 | F | 3.9 | v | No abnormality detected |
| | | 12 | M | 4.0 | s | No abnormality detected |
| | | 13 | F | 3.9 | v | No abnormality detected |
| | | 14 | M | 4.3 | s | No abnormality detected |

s = skeletal; v = visceral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | |
| 2525 | 8s, 7v | 1 | F | 3.7 | s | *Variants: sternebra(e), 5th, unossified* |
| | | 2 | M | 3.6 | v | Head: cranial region, subcutaneous, hemorrhage(s), artifact |
| | | 3 | F | 3.8 | s | *Cervical vert.: cervical vert. centrum(a), 7th, ossified center*<br>*Variants: sternebra(e), 5th, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 4 | F | 3.7 | v | Liver: median liver lobe, additional |
| | | 5 | F | 3.6 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 6 | M | 3.8 | v | Liver: median liver lobe, additional |
| | | 7 | M | 4.0 | s | No abnormality detected |
| | | 8 | M | 4.1 | v | Liver: median liver lobe, additional |
| | | 9 | M | 3.1 | s | *Variants: sternebra(e), 5th, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 10 | F | 3.6 | v | No abnormality detected |
| | | 11 | F | 3.9 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 12 | F | 3.9 | v | No abnormality detected |
| | | 13 | M | 3.5 | s | *Thoracic vert.: thoracic vert. centrum(a), 10th, dumbbell ossified*<br>*Variants: sternebra(e), 5th, incompletely ossified* |
| | | 14 | F | 3.9 | v | No abnormality detected |
| | | 15 | M | 4.1 | s | *Head bones: hyoid body, unossified* |
| 2526 | 7s, 8v | 1 | M | 3.6 | v | No abnormality detected |
| | | 2 | F | 4.0 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 3 | M | 4.2 | v | No abnormality detected |
| | | 4 | M | 4.1 | s | *Variants: sternebra(e), 5th, incompletely ossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | |
| 2526 | 7s, 8v | 4 | M | 4.1 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 5 | M | 4.0 | v | No abnormality detected |
| | | 6 | F | 3.5 | s | *Variants: sternebra(e), 5th, unossified* |
| | | 7 | F | 3.5 | v | Liver: median liver lobe, additional |
| | | 8 | F | 3.8 | s | *Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 9 | F | 3.7 | v | No abnormality detected |
| | | 10 | F | 3.3 | s | *Variants: sternebra(e), 5th- 6th, incompletely ossified* |
| | | 11 | F | 3.8 | v | No abnormality detected |
| | | 12 | F | 3.8 | s | *Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 13 | M | 4.1 | v | No abnormality detected |
| | | 14 | M | 3.9 | s | No abnormality detected |
| | | 15 | F | 3.8 | v | Abdomen: abdominal cavity, hemorrhage(s), artifact |
| 2527 | 7s, 7v | 1 | M | 3.8 | s | No abnormality detected |
| | | 2 | M | 4.2 | v | No abnormality detected |
| | | 3 | M | 4.4 | s | No abnormality detected |
| | | 4 | M | 3.7 | v | Abdomen: testis, left, undescended |
| | | 5 | M | 4.0 | s | No abnormality detected |
| | | 6 | M | 4.0 | v | Kidney/ureter: renal pelvis, bilateral, dilated, small<br>Kidney/ureter: ureter, bilateral, dilated<br>Whole body: whole body, edema |
| | | 7 | M | 4.0 | s | Variants: 14th rib, right, short |

s = skeletal; v = visceral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | |
| 2527 | 7s, 7v | 8 | M | 4.1 | v | No abnormality detected |
| | | 9 | M | 4.0 | s | No abnormality detected |
| | | 10 | M | 4.1 | v | No abnormality detected |
| | | 11 | M | 4.1 | s | No abnormality detected |
| | | 12 | F | 3.9 | v | No abnormality detected |
| | | 13 | M | 4.2 | s | No abnormality detected |
| | | 14 | M | 4.1 | v | No abnormality detected |
| 2528 | 7s, 8v | 1 | F | 4.2 | v | No abnormality detected |
| | | 2 | F | 4.5 | s | No abnormality detected |
| | | 3 | M | 4.4 | v | Abdomen: testis, left, undescended |
| | | 4 | M | 4.1 | s | No abnormality detected |
| | | 5 | F | 4.3 | v | Kidney/ureter: renal pelvis, right, dilated<br>Kidney/ureter: ureter, right, dilated |
| | | 6 | M | 4.5 | s | *Head bones: hyoid body, unossified* |
| | | 7 | F | 4.1 | v | No abnormality detected |
| | | 8 | F | 3.9 | s | *Variants: sternebra(e), 5th, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 9 | F | 4.1 | v | No abnormality detected |
| | | 10 | M | 4.1 | s | No abnormality detected |
| | | 11 | M | 4.4 | v | No abnormality detected |
| | | 12 | M | 4.2 | s | No abnormality detected |
| | | 13 | F | 4.2 | v | No abnormality detected |
| | | 14 | M | 4.1 | s | No abnormality detected |

s = skeletal; v = visceral

Individual Fetal Observations | Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | |
| 2528 | 7s, 8v | 15 | M | 4.0 | v | No abnormality detected |
| 2529 | 8s, 7v | 1 | F | 3.5 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 2 | F | 3.9 | v | No abnormality detected |
| | | 3 | M | 4.0 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 4 | F | 3.7 | v | Brain: medulla oblongata, right, small, hemorrhage(s)<br>Thorax: diaphragm, small, thinning, with liver protrusion(s) |
| | | 5 | F | 3.9 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 6 | F | 4.1 | v | No abnormality detected |
| | | 7 | F | 3.8 | s | *Head bones: hyoid body, unossified*<br>*Variants: sternebra(e), 5th, incompletely ossified* |
| | | 8 | F | 4.1 | v | No abnormality detected |
| | | 9 | M | 4.1 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 10 | M | 3.8 | v | Abdomen: testis, right, malpositioned<br>Liver: median liver lobe, additional |
| | | 11 | M | 4.1 | s | *Head bones: hyoid body, unossified* |
| | | 12 | M | 4.1 | v | No abnormality detected |
| | | 13 | M | 4.2 | s | No abnormality detected |
| | | 14 | M | 3.9 | v | Abdomen: testis, bilateral, malpositioned |
| | | 15 | F | 3.9 | s | No abnormality detected |
| 2530 | 7s, 7v | 1 | F | 4.0 | v | No abnormality detected |
| | | 2 | M | 4.0 | s | *Variants: sternebra(e), 5th, incompletely ossified* |

s = skeletal; v = visceral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | |
| 2530 | 7s, 7v | 2 | M | 4.0 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 3 | F | 4.5 | v | No abnormality detected |
| | | 4 | F | 4.2 | s | *Variants: sternebra(e), 5th, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 5 | M | 4.4 | v | Abdomen: testis, left, malpositioned<br>Thorax: diaphragm, thinning, with liver protrusion(s) |
| | | 6 | F | 4.0 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 7 | F | 3.9 | v | No abnormality detected |
| | | 8 | M | 4.4 | s | *Thoracic vert.: thoracic vert. centrum(a), 10th, dumbbell ossified* |
| | | 9 | M | 4.2 | v | No abnormality detected |
| | | 10 | M | 4.4 | s | No abnormality detected |
| | | 11 | M | 4.2 | v | Liver: median liver lobe, additional |
| | | 12 | M | 4.5 | s | *Variants: sternebra(e), 5th, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 13 | M | 4.1 | v | Liver: median liver lobe, additional |
| | | 14 | F | 3.7 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| 2531 | 7s, 6v | 1 | F | 4.3 | s | No abnormality detected |
| | | 2 | M | 4.4 | v | Abdomen: abdominal cavity, hemorrhage(s), artifact |
| | | 3 | F | 2.6 | s | *Girdles: pubis, bilateral, incompletely ossified*<br>*Head bones: interparietal, incompletely ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 1st, unossified*<br>*Variants: sternebra(e), 2nd, incompletely ossified*<br>*Variants: sternebra(e),5th- 6th, unossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations | Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | |
| 2531 | 7s, 6v | 4 | F | 4.1 | v | Thorax: caudal vena cava, left hepatic vein, anomalous confluence |
| | | 5 | M | 4.3 | s | No abnormality detected |
| | | 6 | F | 3.9 | v | No abnormality detected |
| | | 7 | F | 4.2 | s | No abnormality detected |
| | | 8 | F | 4.1 | v | No abnormality detected |
| | | 9 | M | 4.3 | s | No abnormality detected |
| | | 10 | M | 4.5 | v | No abnormality detected |
| | | 11 | M | 4.2 | s | No abnormality detected |
| | | 12 | M | 4.1 | v | No abnormality detected |
| | | 13 | F | 4.1 | s | No abnormality detected |
| 2532 | 7s, 7v | 1 | M | 4.3 | v | No abnormality detected |
| | | 2 | M | 4.4 | s | No abnormality detected |
| | | 3 | M | 4.6 | v | No abnormality detected |
| | | 4 | F | 4.1 | s | *Cervical vert.: cervical vert. centrum(a), 1st-2nd, ossified center*<br>*Cervical vert.: cervical vert. centrum(a), 5th-7th, ossified center*<br>*Head bones: interparietal, incompletely ossified*<br>*Head bones: parietal, bilateral, incompletely ossified*<br>*Head bones: supraoccipital, incompletely ossified* |
| | | 5 | M | 4.4 | v | No abnormality detected |
| | | 6 | F | 4.3 | s | Ribs: 13th, bilateral, short |
| | | 7 | M | 4.4 | v | No abnormality detected |
| | | 8 | M | 4.5 | s | *Cervical vert.: cervical vert. centrum(a), 3rd-7th, ossified center* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | |
| 2532 | 7s, 7v | 9 | M | 4.8 | v | No abnormality detected |
| | | 10 | F | 4.4 | s | *Head bones: hyoid body, unossified* |
| | | 11 | F | 4.4 | v | Thorax: diaphragm, small, thinning, with liver protrusion(s) |
| | | 12 | M | 4.4 | s | *Head bones: interparietal, incompletely ossified*<br>*Limb bones, metacarpal, 2nd digit, bilateral, incompletely ossified*<br>Ribs: right rib, 13th, short |
| | | 13 | M | 4.9 | v | No abnormality detected |
| | | 14 | M | 4.3 | s | No abnormality detected |
| 2533 | 8s, 7v | 1 | M | 3.5 | s | *Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 2 | F | 3.6 | v | No abnormality detected |
| | | 3 | F | 3.7 | s | *Caudal vertebrae: caudal vertebral arch(es), 2nd, left, incompletely ossified* |
| | | 4 | M | 3.9 | v | No abnormality detected |
| | | 5 | M | 3.8 | s | *Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 6 | M | 3.7 | v | No abnormality detected |
| | | 7 | F | 3.6 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 8 | M | 4.0 | v | No abnormality detected |
| | | 9 | M | 3.7 | s | No abnormality detected |
| | | 10 | M | 4.0 | v | Brain: cerebellum, subdural, hemorrhage(s) |
| | | 11 | F | 4.0 | s | No abnormality detected |

s = skeletal; v = visceral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | |
| 2533 | 8s, 7v | 12 | F | 3.7 | v | No abnormality detected |
| | | 13 | M | 4.1 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 14 | F | 3.7 | v | Abdomen: umbilical artery, left |
| | | 15 | M | 3.7 | s | *Head bones: hyoid body, unossified* |
| 2534 | 2s, 3v | 1 | F | 4.0 | v | No abnormality detected |
| | | 2 | M | 4.0 | s | *Limb bones, metacarpal, 5th digit, right, unossified*<br>*Sacral vertebrae: sacrocaudal vert. arch(es), incompletely ossified*<br>*Variants: sternebra(e), 5th, unossified* |
| | | 3 | F | 3.8 | v | No abnormality detected |
| | | 4 | F | 3.9 | s | *Head bones: interparietal, incompletely ossified*<br>*Head bones: jugal, bilateral, incompletely ossified*<br>*Head bones: parietal, right, incompletely ossified*<br>*Head bones: squamosal, bilateral, incompletely ossified*<br>*Head bones: supraoccipital, incompletely ossified*<br>*Limb bones, metacarpal, 2nd digit, bilateral, incompletely ossified*<br>*Sacral vertebrae: sacrocaudal vert. arch(es), incompletely ossified* |
| | | 5 | M | 4.1 | v | Abdomen: umbilical artery, left |
| 2535 | 7s, 6v | 1 | M | 4.1 | s | *Girdles: pubis, bilateral, incompletely ossified*<br>*Head bones: hyoid body, unossified*<br>*Head bones: interparietal, incompletely ossified*<br>*Head bones: supraoccipital, incompletely ossified*<br>*Variants: sternebra(e), 5th, unossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | |
| 2535 | 7s, 6v | 1 | M | 4.1 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 2 | F | 3.9 | v | Thorax: diaphragm, thinning, with liver protrusion(s) |
| | | 3 | M | 4.2 | s | *Head bones: hyoid body, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 4 | M | 4.3 | v | Thorax: diaphragm, thinning, with liver protrusion(s) |
| | | 5 | M | 4.2 | s | *Variants: sternebra(e), 4th, incompletely ossified*<br>*Variants: sternebra(e), 5th, incompletely ossified* |
| | | 6 | M | 3.9 | v | No abnormality detected |
| | | 7 | M | 3.6 | s | *Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 8 | M | 3.7 | v | No abnormality detected |
| | | 9 | F | 4.0 | s | *Variants: sternebra(e), 5th, unossified* |
| | | 10 | M | 4.4 | v | Liver: median liver lobe, additional |
| | | 11 | M | 4.3 | s | No abnormality detected |
| | | 12 | M | 4.1 | v | Thorax: diaphragm, thinning, with liver protrusion(s)<br>Thorax: innominate artery, short |
| | | 13 | F | 3.7 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| 2536 | 6s, 6v | 1 | F | 4.1 | v | No abnormality detected |
| | | 2 | F | 4.2 | s | *Head bones: interparietal, incompletely ossified* |
| | | 3 | F | 4.2 | v | No abnormality detected |
| | | 4 | M | 4.0 | s | *Limb bones, metacarpal, 5th digit, bilateral, unossified* |
| | | 5 | F | 4.0 | v | No abnormality detected |
| | | 6 | M | 4.1 | s | *Limb bones: phalanx, 4 ossified* |

s = skeletal; v = visceral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | |
| 2536 | 6s, 6v | 7 | M | 4.2 | v | No abnormality detected |
| | | 8 | M | 4.1 | s | *Head bones: parietal, right, incompletely ossified*<br>*Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Sacral vertebrae: sacrocaudal vert. arch(es), incompletely ossified* |
| | | 9 | M | 4.2 | v | No abnormality detected |
| | | 10 | F | 4.0 | s | No abnormality detected |
| | | 11 | F | 4.1 | v | No abnormality detected |
| | | 12 | F | 3.8 | s | *Head bones: supraoccipital, incompletely ossified*<br>*Sacral vertebrae: sacrocaudal vert. arch(es), incompletely ossified* |
| 2537 | 5s, 5v | 1 | F | 3.1 | s | *Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 11th, dumbbell ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 6th, dumbbell ossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 2 | M | 3.9 | v | No abnormality detected |
| | | 3 | F | 3.7 | s | No abnormality detected |
| | | 4 | M | 4.0 | v | Abdomen: abdominal cavity, hemorrhage(s), artifact<br>Cervical: thymus gland, left, partially undescended<br>Liver: median liver lobe, additional |
| | | 5 | F | 3.5 | s | No abnormality detected |
| | | 6 | F | 3.6 | v | No abnormality detected |
| | | 7 | F | 3.8 | s | No abnormality detected |
| | | 8 | M | 4.3 | v | No abnormality detected |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | |
| 2537 | 5s, 5v | 9 | M | 4.1 | s | No abnormality detected |
| | | 10 | F | 3.8 | v | No abnormality detected |
| 2538 | 7s, 7v | 1 | F | 3.9 | v | No abnormality detected |
| | | 2 | M | 3.9 | s | No abnormality detected |
| | | 3 | M | 4.1 | v | No abnormality detected |
| | | 4 | F | 3.9 | s | No abnormality detected |
| | | 5 | M | 4.0 | v | Head: cranial region, subcutaneous, left, hemorrhage(s) |
| | | 6 | M | 3.9 | s | No abnormality detected |
| | | 7 | M | 4.1 | v | No abnormality detected |
| | | 8 | M | 3.9 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 9 | F | 3.9 | v | No abnormality detected |
| | | 10 | F | 4.1 | s | No abnormality detected |
| | | 11 | M | 4.1 | v | No abnormality detected |
| | | 12 | M | 3.9 | s | No abnormality detected |
| | | 13 | M | 4.1 | v | No abnormality detected |
| | | 14 | F | 4.0 | s | No abnormality detected |
| 2539 | 7s, 6v | 1 | M | 3.8 | s | No abnormality detected |
| | | 2 | F | 3.7 | v | No abnormality detected |
| | | 3 | M | 3.9 | s | Variants: 14th rib, left, short |
| | | 4 | F | 3.8 | v | Abdomen: abdominal region, subcutaneous, edema |
| | | 5 | F | 3.9 | s | No abnormality detected |
| | | 6 | M | 3.9 | v | Liver: median liver lobe, additional |

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | |
| 2539 | 7s, 6v | 7 | F | 3.9 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 8 | M | 4.4 | v | No abnormality detected |
| | | 9 | F | 3.7 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 10 | M | 4.1 | v | No abnormality detected |
| | | 11 | F | 3.5 | s | *Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 12 | F | 3.6 | v | No abnormality detected |
| | | 13 | F | 3.3 | s | *Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| 2540 | 7s, 7v | 1 | M | 4.0 | v | No abnormality detected |
| | | 2 | M | 4.0 | s | *Limb bones: phalanx, 4 ossified* |
| | | 3 | M | 4.3 | v | No abnormality detected |
| | | 4 | M | 3.8 | s | *Head bones: hyoid body, unossified* |
| | | 5 | M | 4.0 | v | No abnormality detected |
| | | 6 | M | 4.0 | s | *Head bones: hyoid body, unossified*<br>*Head bones: jugal, bilateral, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 7 | M | 4.2 | v | Liver: median liver lobe, additional |
| | | 8 | M | 4.2 | s | *Head bones: hyoid body, unossified*<br>*Head bones: interparietal, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 9 | F | 3.8 | v | No abnormality detected |

s = skeletal; v = visceral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | |
| 2540 | 7s, 7v | 10 | F | 3.7 | s | *Head bones: hyoid body, unossified* |
| | | 11 | M | 4.1 | v | No abnormality detected |
| | | 12 | F | 3.6 | s | *Head bones: hyoid body, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 13 | M | 4.0 | v | Liver: median liver lobe, additional |
| | | 14 | F | 4.0 | s | *Head bones: hyoid body, unossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 1st, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| 2541 | 4s, 4v | 1 | F | 3.4 | s | *Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 2 | F | 3.4 | v | No abnormality detected |
| | | 3 | F | 3.8 | s | *Head bones: squamosal, right, incompletely ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 11th, dumbbell ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 12th, incompletely ossified* |
| | | 4 | F | 3.8 | v | Abdomen: abdominal cavity, hemorrhage(s)<br>Cervical: thymus gland, left, partially undescended |
| | | 5 | M | 3.8 | s | No abnormality detected |
| | | 6 | M | 3.9 | v | No abnormality detected |
| | | 7 | M | 3.8 | s | *Girdles: ischium, bilateral, incompletely ossified* |
| | | 8 | F | 3.8 | v | Cervical: thymus gland, left, partially undescended<br>Thorax: diaphragm, thinning, with liver protrusion(s) |
| 2542 | 7s, 8v | 1 | F | 3.3 | v | No abnormality detected |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | |
| 2542 | 7s, 8v | 2 | M | 3.9 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 3 | M | 4.1 | v | No abnormality detected |
| | | 4 | F | 3.7 | s | *Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 5 | M | 3.8 | v | Heart: pericardium, hemorrhage |
| | | 6 | F | 3.7 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 7 | M | 3.5 | v | Abdomen: testis, left, malpositioned |
| | | 8 | M | 3.8 | s | *Variants: sternebra(e), 5th, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 9 | F | 3.9 | v | No abnormality detected |
| | | 10 | M | 3.9 | s | *Girdles: pubis, bilateral, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 11 | F | 4.1 | v | No abnormality detected |
| | | 12 | F | 4.0 | s | No abnormality detected |
| | | 13 | M | 4.5 | v | Abdomen: abdominal cavity, hemorrhage(s) |
| | | 14 | F | 4.1 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 15 | M | 4.1 | v | No abnormality detected |
| 2543 | 7s, 7v | 1 | M | 4.3 | s | *Girdles: pubis, bilateral, incompletely ossified*<br>*Head bones: jugal, left, incompletely ossified*<br>*Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |

s = skeletal; v = visceral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | |
| 2543 | 7s, 7v | 2 | M | 4.4 | v | No abnormality detected |
| | | 3 | F | 4.0 | s | No abnormality detected |
| | | 4 | F | 3.8 | v | No abnormality detected |
| | | 5 | M | 4.4 | s | *Limb bones: phalanx, 1 ossified* |
| | | 6 | F | 3.7 | v | No abnormality detected |
| | | 7 | F | 4.1 | s | *Thoracic vert.: thoracic vert. centrum(a), 11th, dumbbell ossified* |
| | | 8 | F | 4.2 | v | No abnormality detected |
| | | 9 | F | 4.3 | s | No abnormality detected |
| | | 10 | M | 4.0 | v | Liver: median liver lobe, additional |
| | | 11 | F | 3.6 | s | *Head bones: hyoid body, unossified*<br>*Head bones: parietal, bilateral, incompletely ossified*<br>*Head bones: squamosal, bilateral, incompletely ossified*<br>*Limb bones, metacarpal, 5th digit, right, unossified*<br>*Sacral vertebrae: sacrocaudal vert. arch(es), incompletely ossified* |
| | | 12 | M | 4.3 | v | Cervical: thymus gland, left, partially undescended |
| | | 13 | F | 4.1 | s | *Limb bones, metacarpal, 5th digit, right, unossified* |
| | | 14 | F | 3.4 | v | No abnormality detected |
| 2544 | 7s, 7v | 1 | M | 4.1 | v | Liver: median liver lobe, additional |
| | | 2 | F | 4.2 | s | No abnormality detected |
| | | 3 | M | 4.5 | v | Liver: median liver lobe, additional |
| | | 4 | M | 4.4 | s | No abnormality detected |
| | | 5 | M | 4.2 | v | No abnormality detected |
| | | 6 | M | 4.1 | s | *Thoracic vert.: thoracic vert. centrum(a), 10th-13th, dumbbell ossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | |
| 2544 | 7s, 7v | 6 | M | 4.1 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 7 | M | 4.4 | v | No abnormality detected |
| | | 8 | M | 4.4 | s | No abnormality detected |
| | | 9 | F | 4.0 | v | No abnormality detected |
| | | 10 | M | 4.4 | s | No abnormality detected |
| | | 11 | F | 3.8 | v | No abnormality detected |
| | | 12 | M | 4.0 | s | No abnormality detected |
| | | 13 | F | 4.2 | v | No abnormality detected |
| | | 14 | F | 4.0 | s | No abnormality detected |
| 2545 | 7s, 7v | 1 | F | 3.9 | s | No abnormality detected |
| | | 2 | F | 4.0 | v | No abnormality detected |
| | | 3 | F | 4.0 | s | No abnormality detected |
| | | 4 | F | 3.9 | v | No abnormality detected |
| | | 5 | F | 3.9 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 6 | M | 4.2 | v | Abdomen: testis, right, malpositioned |
| | | 7 | F | 3.7 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 8 | F | 3.9 | v | No abnormality detected |
| | | 9 | M | 3.6 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 10 | F | 4.1 | v | No abnormality detected |
| | | 11 | M | 3.8 | s | No abnormality detected |
| | | 12 | F | 3.8 | v | Whole body: whole body, edema, subcutaneous |
| | | 13 | M | 4.1 | s | *Thoracic vert.: thoracic vert. centrum(a), 11th, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | |
| 2545 | 7s, 7v | 14 | F | 3.8 | v | No abnormality detected |
| 2546 | 7s, 7v | 1 | F | 3.5 | v | No abnormality detected |
| | | 2 | M | 3.6 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 3 | M | 4.0 | v | No abnormality detected |
| | | 4 | M | 4.0 | s | No abnormality detected |
| | | 5 | M | 4.1 | v | No abnormality detected |
| | | 6 | M | 3.9 | s | No abnormality detected |
| | | 7 | F | 3.7 | v | Liver: median liver lobe, additional |
| | | 8 | F | 3.9 | s | No abnormality detected |
| | | 9 | M | 4.0 | v | Abdomen: abdominal cavity, hemorrhage(s), artifact |
| | | 10 | M | 3.9 | s | *Head bones: hyoid body, unossified* |
| | | 11 | M | 3.9 | v | Abdomen: testis, left, malpositioned |
| | | 12 | F | 4.1 | s | No abnormality detected |
| | | 13 | M | 4.0 | v | No abnormality detected |
| | | 14 | M | 3.5 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| 2547 | 2s, 2v | 1 | M | 4.8 | s | No abnormality detected |
| | | 2 | F | 4.2 | v | No abnormality detected |
| | | 3 | F | 4.6 | s | No abnormality detected |
| | | 4 | M | 4.5 | v | Liver: median liver lobe, additional |
| 2548 | 6s, 6v | 1 | M | 3.8 | v | No abnormality detected |
| | | 2 | F | 3.9 | s | No abnormality detected |

s = skeletal; v = visceral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 2 - 2000 mg/m3 | | | | | | |
| 2548 | 6s, 6v | 3 | F | 3.9 | v | No abnormality detected |
| | | 4 | F | 3.9 | s | No abnormality detected |
| | | 5 | F | 3.6 | v | No abnormality detected |
| | | 6 | F | 3.9 | s | No abnormality detected |
| | | 7 | F | 4.2 | v | Thorax: diaphragm, thinning, with liver protrusion(s) |
| | | 8 | F | 4.0 | s | No abnormality detected |
| | | 9 | F | 3.4 | v | Thorax: diaphragm, small, thinning, with liver protrusion(s) |
| | | 10 | M | 3.3 | s | *Head bones: hyoid body, unossified*<br>*Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 11 | M | 4.4 | v | Thorax: diaphragm, small, thinning, with liver protrusion(s) |
| | | 12 | M | 4.3 | s | *Limb bones, metacarpal, 5th digit, right, unossified* |

s = skeletal; v = visceral

Individual Fetal Observations | Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3549 | 8s, 8v | 1 | M | 3.6 | s | No abnormality detected |
| | | 2 | F | 3.3 | v | No abnormality detected |
| | | 3 | M | 4.0 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 4 | M | 3.5 | v | Liver: median liver lobe, additional |
| | | 5 | M | 3.6 | s | *Girdles: pubis, bilateral, incompletely ossified*<br>*Lumbar vertebrae: lumbar vertebral centrum(a), 1st, incompletely ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 12th, bipartite ossified*<br>*Variants: sternebra(e), 5th, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 6 | M | 3.8 | v | No abnormality detected |
| | | 7 | F | 3.7 | s | *Variants: sternebra(e), 5th, unossified* |
| | | 8 | F | 3.6 | v | No abnormality detected |
| | | 9 | F | 3.7 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 10 | F | 3.1 | v | No abnormality detected |
| | | 11 | M | 3.6 | s | *Thoracic vert.: thoracic vert. centrum(a), 10th-13th, incompletely ossified*<br>*Variants: sternebra(e), 5th, incompletely ossified* |
| | | 12 | M | 3.9 | v | Liver: median liver lobe, additional<br>Abdomen: abdominal cavity, hemorrhage(s), artifact |
| | | 13 | M | 3.4 | s | *Lumbar vertebrae: lumbar vertebral centrum(a), 3rd, asymmetrically ossified*<br>Ribs: 13th, bilateral, misshapen<br>*Thoracic vert.: thoracic vert. centrum(a), 1st, asymmetrically ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 2nd, incompletely ossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3549 | 8s, 8v | 14 | F | 3.6 | v | No abnormality detected |
| | | 15 | F | 3.7 | s | No abnormality detected |
| | | 16 | M | 4.1 | v | Abdomen: testis, right, malpositioned |
| 3550 | 7s, 7v | 1 | M | 3.8 | v | No abnormality detected |
| | | 2 | F | 3.4 | s | *Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Variants: sternebra(e), 5th, unossified* |
| | | 3 | M | 4.1 | v | No abnormality detected |
| | | 4 | M | 3.7 | s | *Head bones: frontal, bilateral, incompletely ossified*<br>*Head bones: interparietal, incompletely ossified*<br>*Head bones: jugal, right, incompletely ossified*<br>*Head bones: squamosal, right, incompletely ossified*<br>*Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Sacral vertebrae: sacrocaudal vert. arch(es), incompletely ossified*<br>*Sternebrae: sternebral center(s), 2nd, incompletely ossified* |
| | | 5 | F | 3.8 | v | No abnormality detected |
| | | 6 | F | 3.7 | s | *Limb bones, metacarpal, 5th digit, bilateral, unossified* |
| | | 7 | F | 3.6 | v | No abnormality detected |
| | | 8 | M | 4.0 | s | *Limb bones, metacarpal, 5th digit, bilateral, unossified* |
| | | 9 | M | 4.0 | v | No abnormality detected |
| | | 10 | M | 4.0 | s | *Sacral vertebrae: sacrocaudal vert. arch(es), incompletely ossified* |
| | | 11 | M | 4.0 | v | No abnormality detected |
| | | 12 | M | 4.2 | s | *Head bones: hyoid body, unossified*<br>*Limb bones, metacarpal, 5th digit, bilateral, unossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3550 | 7s, 7v | 13 | F | 3.2 | v | No abnormality detected |
| | | 14 | F | 3.9 | s | *Limb bones, metacarpal, 5th digit, bilateral, unossified* |
| 3551 | 6s, 5v | 1 | M | 4.5 | s | No abnormality detected |
| | | 2 | M | 4.4 | v | No abnormality detected |
| | | 3 | F | 4.2 | s | No abnormality detected |
| | | 4 | M | 4.4 | v | No abnormality detected |
| | | 5 | M | 4.4 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 6 | F | 4.4 | v | No abnormality detected |
| | | 7 | F | 4.2 | s | *Thoracic vert.: thoracic vert. centrum(a), 11th-12th, incompletely ossified*<br>*Variants: sternebra(e), 2nd, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 8 | F | 4.5 | v | No abnormality detected |
| | | 9 | F | 4.1 | s | *Head bones: supraoccipital, incompletely ossified* |
| | | 10 | F | 4.4 | v | No abnormality detected |
| | | 11 | F | 4.1 | s | *Variants: sternebra(e), 5th, unossified* |
| 3552 | 5s, 6v | 1 | M | 4.4 | v | Thorax: caudal vena cava, left hepatic vein, anomalous confluence<br>Abdomen: abdominal cavity, hemorrhage(s), artifact |
| | | 2 | M | 4.1 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 3 | F | 4.1 | v | No abnormality detected |
| | | 4 | M | 4.4 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 5 | F | 4.2 | v | Liver: median liver lobe, additional |
| | | 6 | F | 3.9 | s | *Head bones: hyoid body, unossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3552 | 5s, 6v | 6 | F | 3.9 | s | *Thoracic vert.: thoracic vert. centrum(a), 13th, incompletely ossified*<br>*Variants: sternebra(e), 5th, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 7 | F | 4.2 | v | Liver: median liver lobe, additional |
| | | 8 | F | 4.1 | s | *Thoracic vert.: thoracic vert. centrum(a), 12th, dumbbell ossified*<br>*Variants: sternebra(e), 5th, incompletely ossified* |
| | | 9 | F | 4.3 | v | No abnormality detected |
| | | 10 | F | 4.3 | s | Ribs: right rib, 13th, short<br>*Variants: sternebra(e), 5th, unossified* |
| | | 11 | F | 4.3 | v | No abnormality detected |
| 3553 | 8s, 7v | 1 | M | 4.1 | s | No abnormality detected |
| | | 2 | M | 3.9 | v | Abdomen: umbilical artery, left |
| | | 3 | M | 4.1 | s | No abnormality detected |
| | | 4 | M | 4.0 | v | No abnormality detected |
| | | 5 | M | 4.3 | s | No abnormality detected |
| | | 6 | F | 4.0 | v | No abnormality detected |
| | | 7 | F | 4.1 | s | No abnormality detected |
| | | 8 | M | 4.3 | v | No abnormality detected |
| | | 9 | M | 4.1 | s | No abnormality detected |
| | | 10 | F | 4.2 | v | Abdomen: abdominal cavity, hemorrhage(s), artifact |
| | | 11 | M | 4.1 | s | No abnormality detected |
| | | 12 | F | 4.2 | v | No abnormality detected |
| | | 13 | F | 4.2 | s | No abnormality detected |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3553 | 8s, 7v | 14 | F | 4.0 | v | Abdomen: abdominal region, subcutaneous, edema |
| | | 15 | F | 4.0 | s | No abnormality detected |
| 3554 | 9s, 9v | 1 | M | 4.3 | v | No abnormality detected |
| | | 2 | F | 3.6 | s | *Variants: sternebra(e), 6th, unossified* |
| | | 3 | F | 3.7 | v | No abnormality detected |
| | | 4 | M | 3.8 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 5 | F | 3.8 | v | Thorax: diaphragm, small, thinning, with liver protrusion(s) |
| | | 6 | M | 3.9 | s | *Girdles: pubis, right, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 7 | M | 4.1 | v | No abnormality detected |
| | | 8 | M | 4.1 | s | No abnormality detected |
| | | 9 | F | 3.9 | v | Thorax: diaphragm, small, thinning, with liver protrusion(s) |
| | | 10 | M | 4.0 | s | *Cervical vert.: cervical vert. centrum(a), 1st, ossified center*<br>*Head bones: hyoid body, unossified*<br>*Head bones: interparietal, incompletely ossified* |
| | | 11 | M | 4.0 | v | No abnormality detected |
| | | 12 | F | 4.0 | s | No abnormality detected |
| | | 13 | F | 4.2 | v | Liver: median liver lobe, additional |
| | | 14 | M | 4.0 | s | No abnormality detected |
| | | 15 | M | 4.5 | v | Abdomen: abdominal region, subcutaneous, edema |
| | | 16 | M | 4.0 | s | No abnormality detected |
| | | 17 | M | 4.5 | v | No abnormality detected |
| | | 18 | M | 4.4 | s | *Variants: sternebra(e), 6th, incompletely ossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations | Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3555 | 5s, 5v | 1 | M | 3.6 | s | No abnormality detected |
| | | 2 | M | 4.5 | v | Thorax: diaphragm, thinning, with liver protrusion(s) |
| | | 3 | M | 4.0 | s | No abnormality detected |
| | | 4 | M | 4.0 | v | Thorax: diaphragm, thinning, with liver protrusion(s) |
| | | 5 | M | 3.9 | s | *Thoracic vert.: thoracic vert. centrum(a), 1st, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 6 | F | 3.8 | v | No abnormality detected |
| | | 7 | M | 3.8 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 8 | F | 3.9 | v | No abnormality detected |
| | | 9 | F | 3.7 | s | No abnormality detected |
| | | 10 | F | 3.7 | v | No abnormality detected |
| 3556 | 7s, 8v | 1 | M | 4.0 | v | No abnormality detected |
| | | 2 | M | 4.0 | s | No abnormality detected |
| | | 3 | F | 4.0 | v | No abnormality detected |
| | | 4 | F | 4.0 | s | *Head bones: hyoid body, unossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 10th-12th, dumbbell ossified* |
| | | 5 | M | 4.1 | v | Abdomen: testis, left, malpositioned |
| | | 6 | F | 4.0 | s | No abnormality detected |
| | | 7 | F | 4.5 | v | No abnormality detected |
| | | 8 | F | 4.2 | s | *Variants: sternebra(e), 5th, incompletely ossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3556 | 7s, 8v | 9 | F | 3.9 | v | No abnormality detected |
| | | 10 | M | 4.4 | s | *Head bones: interparietal, incompletely ossified* |
| | | 11 | F | 3.9 | v | No abnormality detected |
| | | 12 | F | 3.8 | s | *Thoracic vert.: thoracic vert. centrum(a), 10th, incompletely ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 12th, incompletely ossified*<br>*Variants: sternebra(e), 5th, incompletely ossified* |
| | | 13 | M | 4.2 | v | Liver: median liver lobe, additional |
| | | 14 | F | 4.1 | s | No abnormality detected |
| | | 15 | F | 4.0 | v | Liver: median liver lobe, additional |
| 3557 | 9s, 8v | 1 | F | 3.7 | s | *Caudal vertebrae: caudal vertebral arch(es), 2nd, left, incompletely ossified*<br>*Head bones: hyoid body, unossified*<br>*Variants: sternebra(e), 5th, incompletely ossified* |
| | | 2 | F | 4.1 | v | No abnormality detected |
| | | 3 | F | 3.7 | s | No abnormality detected |
| | | 4 | F | 3.8 | v | No abnormality detected |
| | | 5 | F | 3.8 | s | No abnormality detected |
| | | 6 | F | 4.2 | v | No abnormality detected |
| | | 7 | M | 4.2 | s | *Thoracic vert.: thoracic vert. centrum(a), 10th, bipartite ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 8 | F | 3.4 | v | Abdomen: umbilical artery, left |
| | | 9 | F | 3.7 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 10 | M | 3.7 | v | No abnormality detected |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3557 | 9s, 8v | 11 | M | 4.2 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 12 | M | 4.3 | v | No abnormality detected |
| | | 13 | M | 4.5 | s | *Thoracic vert.: thoracic vert. centrum(a), 13th, dumbbell ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 14 | M | 4.6 | v | No abnormality detected |
| | | 15 | F | 3.8 | s | *Thoracic vert.: thoracic vert. centrum(a), 10th-12th, dumbbell ossified* |
| | | 16 | M | 4.5 | v | No abnormality detected |
| | | 17 | M | 4.5 | s | *Thoracic vert.: thoracic vert. centrum(a), 10th-12th, incompletely ossified*<br>*Variants: sternebra(e), 5th, incompletely ossified* |
| 3558 | 8s, 8v | 1 | F | 3.8 | v | Kidney/ureter: renal papilla, bilateral, small<br>Kidney/ureter: ureter, bilateral, dilated |
| | | 2 | F | 3.8 | s | *Limb bones: phalanx, 3 ossified*<br>*Variants: sternebra(e), 5th, incompletely ossified* |
| | | 3 | M | 4.2 | v | Cervical: thymus gland, right, partially undescended |
| | | 4 | M | 4.0 | s | Limb bones: phalanx, 4 ossified<br>Ribs: left rib, 13th, short<br>*Variants: sternebra(e), 5th, unossified* |
| | | 5 | M | 4.0 | v | No abnormality detected |
| | | 6 | M | 3.8 | s | No abnormality detected |
| | | 7 | F | 3.9 | v | No abnormality detected |
| | | 8 | M | 3.9 | s | *Head bones: hyoid body, unossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 8th, dumbbell ossified* |
| | | 9 | F | 3.6 | v | Liver: median liver lobe, additional |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3558 | 8s, 8v | 10 | M | 4.0 | s | *Head bones: hyoid body, unossified* |
| | | 11 | M | 4.2 | v | Liver: median liver lobe, additional |
| | | 12 | F | 4.0 | s | Cervical vert.: cervical rib, left<br>*Variants: sternebra(e), 5th, unossified* |
| | | 13 | M | 3.9 | v | No abnormality detected |
| | | 14 | M | 4.2 | s | No abnormality detected |
| | | 15 | F | 4.0 | v | Kidney/ureter: renal pelvis, left, dilated<br>Kidney/ureter: ureter, left, dilated |
| | | 16 | F | 3.8 | s | *Variants: sternebra(e), 5th, unossified* |
| 3559 | 6s, 6v | 1 | F | 3.6 | s | No abnormality detected |
| | | 2 | F | 4.2 | v | No abnormality detected |
| | | 3 | M | 4.2 | s | *Cervical vert.: cervical vert. centrum(a), 6 ossifed*<br>*Limb bones: phalanx, 4 ossified* |
| | | 4 | F | 4.2 | v | No abnormality detected |
| | | 5 | M | 4.2 | s | *Thoracic vert.: thoracic vert. centrum(a), 10th, bipartite ossified* |
| | | 6 | M | 3.9 | v | Cervical: thymus gland, left, partially undescended |
| | | 7 | M | 4.2 | s | No abnormality detected |
| | | 8 | F | 3.9 | v | Abdomen: umbilical artery, left |
| | | 9 | F | 3.9 | s | No abnormality detected |
| | | 10 | F | 4.1 | v | No abnormality detected |
| | | 11 | F | 4.3 | s | *Limb bones: phalanx, 4 ossified* |
| | | 12 | M | 4.2 | v | Cervical: thymus gland, left, partially undescended |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3560 | 7s, 7v | 1 | F | 3.7 | v | No abnormality detected |
| | | 2 | F | 4.0 | s | No abnormality detected |
| | | 3 | M | 4.2 | v | No abnormality detected |
| | | 4 | M | 4.1 | s | *Head bones: hyoid body, unossified* |
| | | 5 | F | 3.8 | v | No abnormality detected |
| | | 6 | M | 4.1 | s | No abnormality detected |
| | | 7 | M | 4.0 | v | No abnormality detected |
| | | 8 | F | 3.9 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 9 | F | 4.2 | v | No abnormality detected |
| | | 10 | F | 3.9 | s | No abnormality detected |
| | | 11 | F | 4.1 | v | Liver: median liver lobe, additional |
| | | 12 | M | 4.1 | s | *Limb bones: phalanx, 4 ossified*<br>Variants: 14th rib, right, short |
| | | 13 | F | 3.9 | v | No abnormality detected |
| | | 14 | M | 3.8 | s | *Girdles: pubis, left, incompletely ossified*<br>*Head bones: hyoid body, unossified*<br>*Limb bones, metacarpal, 5th digit, left, unossified*<br>Variants: 14th rib, right, short<br>*Variants: sternebra(e), 5th, unossified* |
| 3561 | 7s, 6v | 1 | F | 3.5 | s | *Cervical vert.: cervical vert. centrum(a), 1st, ossified center*<br>*Cervical vert.: cervical vert. centrum(a), 7th, ossified center*<br>*Thoracic vert.: thoracic vert. centrum(a), 10th-13th, dumbbell ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 8th, incompletely ossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3561 | 7s, 6v | 1 | F | 3.5 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 2 | F | 3.6 | v | Abdomen: abdominal cavity, hemorrhage(s), artifact |
| | | 3 | M | 3.9 | s | No abnormality detected |
| | | 4 | M | 3.5 | v | Abdomen: abdominal cavity, hemorrhage(s), artifact |
| | | 5 | F | 3.7 | s | *Thoracic vert.: thoracic vert. centrum(a), 12th, asymmetrically ossified*<br>*Variants: sternebra(e), 5th, incompletely ossified* |
| | | 6 | F | 3.7 | v | Liver: median liver lobe, additional |
| | | 7 | F | 3.5 | s | *Thoracic vert.: thoracic vert. centrum(a), 10th-13th, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 8 | F | 3.6 | v | No abnormality detected |
| | | 9 | F | 3.7 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 10 | F | 3.7 | v | Liver: median liver lobe, additional |
| | | 11 | F | 3.7 | s | *Thoracic vert.: thoracic vert. centrum(a), 9th, dumbbell ossified* |
| | | 12 | F | 3.4 | v | Cervical: thymus gland, left, partially undescended |
| | | 13 | M | 3.5 | s | No abnormality detected |
| 3562 | 6s, 7v | 1 | M | 2.4 | v | No abnormality detected |
| | | 2 | M | 2.5 | s | *Girdles: pubis, bilateral, incompletely ossified*<br>*Head bones: squamosal, bilateral, incompletely ossified*<br>*Limb bones, metatarsal, 5th digit, bilateral, unossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, unossified* |
| | | 3 | F | 2.2 | v | Thorax: innominate artery, absent<br>Thorax: subclavian artery, right, arises from aortic arch |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations | Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3562 | 6s, 7v | 4 | M | 2.4 | s | *Cervical vert.: cervical vertebral arch(es), 3rd-6th, incompletely ossified*<br>*Girdles: ischium, bilateral, unossified*<br>*Girdles: pubis, bilateral, unossified*<br>*Head bones: hyoid body, unossified*<br>*Head bones: interparietal, incompletely ossified*<br>*Head bones: maxilla/jugal, bilateral, incompletely ossified*<br>*Head bones: parietal, bilateral, incompletely ossified*<br>*Head bones: squamosal, bilateral, incompletely ossified*<br>*Head bones: supraoccipital, incompletely ossified*<br>*Limb bones, metacarpal, 2nd digit, right, incompletely ossified*<br>*Limb bones, metacarpal, 4th digit, right, incompletely ossified*<br>*Limb bones: metacarpal, 2nd digit, left, incompletely ossified*<br>*Sacral vertebrae: sacral vertebral arch(es), 1st-3rd, bilateral, unossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 1st, incompletely ossified*<br>*Variants: sternebra(e), 2nd, incompletely ossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 5 | M | 2.5 | v | No abnormality detected |
| | | 6 | M | 2.3 | s | *Caudal vertebrae: caudal vertebra centrum(a), 2nd, unossified*<br>*Caudal vertebrae: caudal vertebral arch(es), bilateral, unossified*<br>*Girdles: pubis, bilateral, unossified*<br>*Head bones: hyoid body, unossified*<br>*Head bones: interparietal, incompletely ossified*<br>*Head bones: squamosal, bilateral, incompletely ossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations | Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3562 | 6s, 7v | 6 | M | 2.3 | s | *Head bones: supraoccipital, incompletely ossified*<br>*Limb bones, metatarsal, 5th digit, bilateral, incompletely ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 1st, unossified*<br>*Variants: sternebra(e), 2nd, 5th sternebra(e), unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 7 | M | 2.2 | v | Brain: 3rd ventricle, dilated |
| | | 8 | M | 2.3 | s | *Caudal vertebrae: caudal vertebral arch(es), 1st-2nd, bilateral, unossified*<br>*Girdles: pubis, bilateral, incompletely ossified*<br>*Head bones: hyoid body, unossified*<br>*Head bones: interparietal, incompletely ossified*<br>*Head bones: maxilla/jugal, bilateral, incompletely ossified*<br>*Head bones: parietal, bilateral, incompletely ossified*<br>*Head bones: squamosal, bilateral, incompletely ossified*<br>*Limb bones, metatarsal, 5th digit, bilateral, incompletely ossified*<br>*Limb bones: metacarpal, 2nd digit, incompletely ossified*<br>*Sacral vertebrae: sacral vertebral arch(es), 2nd, right, incompletely ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 1st, incompletely ossified*<br>*Variants: sternebra(e), 1st, unossified* |
| | | 9 | F | 2.1 | v | No abnormality detected |
| | | 10 | M | 2.3 | s | *Caudal vertebrae: caudal vertebra centrum(a), 2nd, unossified*<br>*Caudal vertebrae: caudal vertebral arch(es), 1st-2nd, bilateral, unossified*<br>*Girdles: pubis, bilateral, unossified*<br>*Head bones: hyoid body, unossified*<br>*Head bones: squamosal, bilateral, incompletely ossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3562 | 6s, 7v | 10 | M | 2.3 | s | *Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Limb bones, metatarsal, 5th digit, bilateral, incompletely ossified*<br>*Sacral vertebrae: sacral vertebral arch(es), 2nd, bilateral, unossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 1st, unossified*<br>*Variants: sternebra(e), 1st, 4th sternebra(e), unossified*<br>*Variants: sternebra(e), 5th, unossified* |
| | | 11 | M | 2.5 | v | No abnormality detected |
| | | 12 | F | 2.1 | s | *Caudal vertebrae: caudal vertebral arch(es), 1st-2nd, bilateral, unossified*<br>*Girdles: ischium, bilateral, incompletely ossified*<br>*Girdles: pubis, bilateral, unossified*<br>*Head bones: interparietal, incompletely ossified*<br>*Head bones: parietal, bilateral, incompletely ossified*<br>*Head bones: squamosal, bilateral, incompletely ossified*<br>*Limb bones, metacarpal, 2nd digit, bilateral, incompletely ossified*<br>*Limb bones, metatarsal, 5th digit, bilateral, unossified*<br>*Limb bones: metacarpal, 2nd digit, 5th digit, bilateral, unossified*<br>*Sacral vertebrae: sacral vertebral arch(es), 2nd, bilateral, incompletely ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 1st, unossified*<br>*Variants: sternebra(e), 2nd, 5th sternebra(e), unossified*<br>*Variants: sternebra(e), 6th, unossified* |
| | | 13 | M | 2.5 | v | Abdomen: testis, right, malpositioned<br>Kidney/ureter: renal pelvis, left, dilated<br>Kidney/ureter: ureter, left, dilated |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3563 | 8s, 7v | 1 | M | 4.0 | s | *Head bones: hyoid body, unossified*<br>*Variants: sternebra(e), 5th, incompletely ossified* |
| | | 2 | M | 4.3 | v | Liver: median liver lobe, additional |
| | | 3 | M | 4.3 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 4 | F | 4.1 | v | No abnormality detected |
| | | 5 | M | 4.2 | s | *Head bones: squamosal, left, incompletely ossified* |
| | | 6 | M | 4.3 | v | No abnormality detected |
| | | 7 | M | 4.3 | s | *Cervical vert.: cervical vert. centrum(a), 2nd-7th, ossified center* |
| | | 8 | F | 4.2 | v | No abnormality detected |
| | | 9 | M | 4.4 | s | *Cervical vert.: cervical vert. centrum(a), 1st-7th, ossified center* |
| | | 10 | M | 4.6 | v | Liver: median liver lobe, additional<br>Abdomen: abdominal cavity, hemorrhage(s), artifact |
| | | 11 | F | 4.2 | s | *Head bones: interparietal, incompletely ossified* |
| | | 12 | F | 3.4 | v | No abnormality detected |
| | | 13 | F | 4.1 | s | *Head bones: hyoid body, unossified*<br>*Variants: sternebra(e), 5th, incompletely ossified* |
| | | 14 | M | 4.4 | v | No abnormality detected |
| | | 15 | M | 4.3 | s | *Head bones: squamosal, bilateral, incompletely ossified*<br>*Head bones: supraoccipital, incompletely ossified* |
| 3564 | 7s, 7v | 1 | M | 4.0 | v | Liver: median liver lobe, additional |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3564 | 7s, 7v | 2 | F | 3.7 | s | No abnormality detected |
| | | 3 | F | 3.8 | v | No abnormality detected |
| | | 4 | F | 3.3 | s | *Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 5 | M | 3.6 | v | No abnormality detected |
| | | 6 | M | 4.1 | s | *Variants: sternebra(e), 5th, unossified* |
| | | 7 | F | 3.6 | v | No abnormality detected |
| | | 8 | M | 4.0 | s | No abnormality detected |
| | | 9 | M | 3.8 | v | No abnormality detected |
| | | 10 | F | 3.8 | s | *Variants: sternebra(e), 5th, unossified* |
| | | 11 | F | 3.8 | v | No abnormality detected |
| | | 12 | M | 4.3 | s | *Limb bones: phalanx, 2 ossified* |
| | | 13 | M | 4.0 | v | Liver: median liver lobe, additional<br>Thorax: innominate artery, short |
| | | 14 | F | 3.7 | s | *Limb bones, metacarpal, 5th digit, left, unossified* |
| 3565 | 5s, 4v | 1 | M | 4.5 | s | *Thoracic vert.: thoracic vert. centrum(a), 9th, dumbbell ossified* |
| | | 2 | F | 4.3 | v | No abnormality detected |
| | | 3 | M | 4.3 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 4 | M | 4.5 | v | No abnormality detected |
| | | 5 | M | 4.3 | s | No abnormality detected |
| | | 6 | F | 4.2 | v | No abnormality detected |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3565 | 5s, 4v | 7 | F | 4.2 | s | *Variants: sternebra(e), 5th, unossified* |
| | | 8 | F | 4.1 | v | No abnormality detected |
| | | 9 | F | 4.1 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| 3566 | 7s, 8v | 1 | M | 3.6 | v | No abnormality detected |
| | | 2 | F | 3.5 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 3 | F | 3.3 | v | No abnormality detected |
| | | 4 | M | 3.5 | s | No abnormality detected |
| | | 5 | F | 3.3 | v | Abdomen: abdominal cavity, hemorrhage(s), artifact |
| | | 6 | M | 3.6 | s | *Head bones: hyoid body, unossified*<br>*Variants: sternebra(e), 5th, incompletely ossified* |
| | | 7 | M | 3.5 | v | No abnormality detected |
| | | 8 | M | 3.9 | s | *Thoracic vert.: thoracic vert. centrum(a), 12th, bipartite ossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 9 | F | 3.6 | v | Limbs: right hind limb, hemorrhage(s), artifact |
| | | 10 | M | 3.8 | s | *Thoracic vert.: thoracic vert. centrum(a), 11th, incompletely ossified* |
| | | 11 | F | 4.0 | v | No abnormality detected |
| | | 12 | M | 3.7 | s | No abnormality detected |
| | | 13 | M | 3.5 | v | No abnormality detected |
| | | 14 | F | 3.6 | s | *Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 15 | F | 3.8 | v | Thorax: thoracic cavity, hemorrhage(s) |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3567 | 5s, 5v | 1 | F | 4.5 | s | *Ribs: left rib, 12th, incompletely ossified* |
| | | 2 | M | 4.4 | v | No abnormality detected |
| | | 3 | M | 4.9 | s | *Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 4 | M | 5.1 | v | Brain: cerebellum, subdural, hemorrhage(s)<br>Kidney/ureter: renal pelvis, left, dilated<br>Kidney/ureter: ureter, left, dilated |
| | | 5 | F | 4.6 | s | *Head bones: interparietal, incompletely ossified* |
| | | 6 | F | 4.4 | v | Abdomen: abdominal cavity, hemorrhage(s), artifact |
| | | 7 | F | 4.5 | s | No abnormality detected |
| | | 8 | F | 3.7 | v | Abdomen: abdominal region, subcutaneous, edema |
| | | 9 | F | 4.4 | s | *Cervical vert.: cervical vert. centrum(a), 5th-7th, ossified center* |
| | | 10 | M | 4.2 | v | Thorax: diaphragm, thinning, with liver protrusion(s) |
| 3568 | 7s, 8v | 1 | F | 3.6 | v | Brain: medulla oblongata, right, small, hemorrhage(s)<br>Limbs: left forelimb, small, hemorrhage(s)<br>Head: cranial region, subcutaneous, small, hemorrhage(s), artifact |
| | | 2 | F | 3.5 | s | *Limb bones, metacarpal, 5th digit, left, unossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 3 | M | 3.6 | v | No abnormality detected |
| | | 4 | F | 3.4 | s | *Head bones: hyoid body, unossified*<br>*Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Sternebrae: sternebral center(s), 2nd, incompletely ossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3568 | 7s, 8v | 4 | F | 3.4 | s | *Variants: sternebra(e), 5th, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 5 | F | 3.7 | v | No abnormality detected |
| | | 6 | M | 3.5 | s | *Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Variants: sternebra(e), 5th, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 7 | F | 3.5 | v | No abnormality detected |
| | | 8 | F | 3.4 | s | *Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Variants: sternebra(e), 5th, unossified* |
| | | 9 | M | 3.7 | v | No abnormality detected |
| | | 10 | F | 3.6 | s | *Limb bones, metacarpal, 5th digit, bilateral, unossified* |
| | | 11 | M | 4.0 | v | No abnormality detected |
| | | 12 | M | 3.6 | s | No abnormality detected |
| | | 13 | M | 3.6 | v | No abnormality detected |
| | | 14 | F | 3.1 | s | *Head bones: hyoid body, unossified*<br>*Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 15 | F | 3.1 | v | No abnormality detected |
| 3569 | 7s, 7v | 1 | F | 3.6 | s | No abnormality detected |
| | | 2 | M | 3.9 | v | Abdomen: abdominal region, subcutaneous, edema |
| | | 3 | M | 4.0 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 4 | M | 3.9 | v | Thorax: innominate artery, short |

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3569 | 7s, 7v | 5 | M | 4.1 | s | No abnormality detected |
| | | 6 | F | 3.7 | v | Cervical: thyroid gland, left, enlarged |
| | | 7 | F | 3.2 | s | *Girdles: ischium, bilateral, incompletely ossified*<br>*Girdles: pubis, bilateral, incompletely ossified*<br>*Head bones: interparietal, incompletely ossified*<br>*Head bones: jugal, bilateral, incompletely ossified*<br>*Head bones: parietal, bilateral, incompletely ossified*<br>*Head bones: squamosal, bilateral, incompletely ossified*<br>*Head bones: supraoccipital, incompletely ossified*<br>*Limb bones: metacarpal, 2nd digit, left, incompletely ossified*<br>*Limb bones: metacarpal, 2nd digit, 5th digit, right, incompletely ossified*<br>*Sacral vertebrae: sacrocaudal vert. arch(es), bilateral, incompletely ossified*<br>*Variants: sternebra(e), 1st, 3rd, and 6th sternebra(e), incompletely ossified*<br>*Variants: sternebra(e), 5th, unossified* |
| | | 8 | M | 3.8 | v | No abnormality detected |
| | | 9 | M | 3.6 | s | *Caudal vertebrae: caudal vertebral arch(es), 1st, left, incompletely ossified*<br>*Caudal vertebrae: caudal vertebral arch(es), 2nd, bilateral, incompletely ossified*<br>*Head bones: hyoid body, unossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 11th, dumbbell ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 10 | M | 3.8 | v | No abnormality detected |
| | | 11 | F | 3.4 | s | *Variants: sternebra(e), 5th, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3569 | 7s, 7v | 12 | M | 3.7 | v | Liver: median liver lobe, additional |
| | | 13 | F | 3.6 | s | No abnormality detected |
| | | 14 | F | 3.7 | v | Liver: median liver lobe, additional |
| 3570 | 8s, 9v | 1 | M | 3.7 | v | No abnormality detected |
| | | 2 | M | 3.8 | s | *Head bones: hyoid body, unossified*<br>*Head bones: interparietal, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 3 | F | 3.9 | v | No abnormality detected |
| | | 4 | F | 3.7 | s | *Variants: sternebra(e), 5th, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 5 | F | 3.7 | v | No abnormality detected |
| | | 6 | M | 3.8 | s | *Thoracic vert.: thoracic vert. centrum(a), 12th, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 7 | F | 4.0 | v | No abnormality detected |
| | | 8 | F | 3.9 | s | No abnormality detected |
| | | 9 | F | 3.8 | v | No abnormality detected |
| | | 10 | M | 3.8 | s | *Thoracic vert.: thoracic vert. centrum(a), 12th, dumbbell ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 11 | F | 3.5 | v | No abnormality detected |
| | | 12 | M | 3.9 | s | *Head bones: hyoid body, unossified*<br>*Head bones: interparietal, incompletely ossified* |
| | | 13 | M | 4.0 | v | No abnormality detected |
| | | 14 | M | 4.1 | s | *Variants: sternebra(e), 5th, incompletely ossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3570 | 8s, 9v | 15 | M | 3.9 | v | No abnormality detected |
| | | 16 | M | 4.2 | s | No abnormality detected |
| | | 17 | F | 3.8 | v | No abnormality detected |
| 3571 | 7s, 6v | 1 | F | 3.9 | s | No abnormality detected |
| | | 2 | M | 4.6 | v | No abnormality detected |
| | | 3 | F | 4.1 | s | Variants: 14th rib, bilateral, short |
| | | 4 | M | 4.4 | v | No abnormality detected |
| | | 5 | M | 4.4 | s | No abnormality detected |
| | | 6 | M | 4.2 | v | No abnormality detected |
| | | 7 | M | 4.4 | s | No abnormality detected |
| | | 8 | M | 4.2 | v | No abnormality detected |
| | | 9 | M | 4.5 | s | *Limb bones: phalanx, 1 ossified* |
| | | 10 | M | 4.6 | v | No abnormality detected |
| | | 11 | M | 3.5 | s | No abnormality detected |
| | | 12 | F | 4.3 | v | No abnormality detected |
| | | 13 | M | 3.6 | s | *Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Sacral vertebrae: sacrocaudal vert. arch(es), incompletely ossified*<br>*Variants: sternebra(e), 5th, incompletely ossified* |
| 3572 | 6s, 7v | 0 | U | 0.0 | s | No abnormality detected |
| | | 1 | F | 2.8 | v | Kidney/ureter: renal papilla, right, small |
| | | 2 | F | 3.5 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 3 | M | 4.2 | v | No abnormality detected |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 3 - 10000 mg/m3 | | | | | | |
| 3572 | 6s, 7v | 4 | F | 3.8 | s | No abnormality detected |
| | | 5 | M | 3.7 | v | No abnormality detected |
| | | 6 | F | 3.5 | s | *Girdles: pubis, bilateral, incompletely ossified*<br>*Head bones: squamosal, bilateral, incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 7 | M | 3.7 | v | No abnormality detected |
| | | 8 | M | 3.2 | s | *Girdles: pubis, bilateral, incompletely ossified*<br>*Head bones: squamosal, bilateral, incompletely ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 12th, dumbbell ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 13th, bipartite ossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, unossified* |
| | | 9 | M | 3.2 | v | No abnormality detected |
| | | 10 | F | 3.2 | s | *Head bones: interparietal, incompletely ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 12th, dumbbell ossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 11 | M | 3.9 | v | No abnormality detected |
| | | 12 | M | 3.8 | s | *Girdles: pubis, bilateral, incompletely ossified*<br>*Head bones: interparietal, incompletely ossified* |
| | | 13 | M | 4.0 | v | No abnormality detected |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | | |
| 4573 | 7s, 6v | 1 | M | 3.8 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 2 | F | 4.0 | v | Liver: median liver lobe, additional |
| | | 3 | F | 3.4 | s | *Variants: sternebra(e), 5th, unossified* |
| | | 4 | M | 3.8 | v | No abnormality detected |
| | | 5 | F | 3.7 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 6 | F | 3.5 | v | No abnormality detected |
| | | 7 | F | 3.6 | s | *Variants: sternebra(e), 5th, unossified* |
| | | 8 | M | 3.8 | v | Liver: median liver lobe, additional |
| | | 9 | M | 3.7 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 10 | F | 3.6 | v | No abnormality detected |
| | | 11 | F | 3.8 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 12 | M | 3.7 | v | No abnormality detected |
| | | 13 | F | 3.6 | s | *Variants: sternebra(e), 5th, unossified* |
| 4574 | 7s, 8v | 1 | M | 4.3 | v | THORAX: AORTIC ARCH, INTERRUPTED<br>THORAX: SUBCLAVIAN ARTERY, LEFT, ARISES FROM DUCTUS ARTERIOS |
| | | 2 | F | 3.7 | s | *Head bones: hyoid body, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 3 | F | 3.5 | v | Thorax: innominate artery, short |
| | | 4 | M | 3.9 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 5 | M | 4.1 | v | No abnormality detected |
| | | 6 | F | 3.5 | s | *Variants: sternebra(e), 6th, incompletely ossified* |

s = skeletal; v = visceral

Individual Fetal Observations | Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | | |
| 4574 | 7s, 8v | 7 | M | 3.7 | v | Abdomen: testis, left, undescended |
| | | 8 | F | 3.5 | s | *Girdles: ischium, bilateral, incompletely ossified*<br>*Variants: sternebra(e), 1st, incompletely ossified*<br>*Variants: sternebra(e), 5th, incompletely ossified* |
| | | 9 | F | 3.5 | v | No abnormality detected |
| | | 10 | M | 3.9 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 11 | M | 3.7 | v | No abnormality detected |
| | | 12 | M | 3.9 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 13 | F | 3.7 | v | No abnormality detected |
| | | 14 | M | 4.0 | s | *Head bones: hyoid body, unossified* |
| | | 15 | M | 3.9 | v | No abnormality detected |
| 4575 | 9s, 8v | 1 | F | 3.8 | s | No abnormality detected |
| | | 2 | M | 3.9 | v | Thorax: diaphragm, thinning, with liver protrusion(s) |
| | | 3 | M | 3.9 | s | No abnormality detected |
| | | 4 | F | 3.7 | v | No abnormality detected |
| | | 5 | M | 4.0 | s | *Limb bones, metacarpal, 5th digit, bilateral, unossified* |
| | | 6 | M | 4.1 | v | No abnormality detected |
| | | 7 | F | 4.0 | s | *Limb bones, metacarpal, 5th digit, left, unossified* |
| | | 8 | F | 4.0 | v | No abnormality detected |
| | | 9 | M | 4.0 | s | No abnormality detected |

s = skeletal; v = visceral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | | |
| 4575 | 9s, 8v | 10 | M | 4.1 | v | Thorax: caudal vena cava, left hepatic vein, anomalous confluence |
| | | 11 | F | 3.8 | s | *Head bones: interparietal, incompletely ossified*<br>*Limb bones, metacarpal, 5th digit, left, unossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 12 | F | 3.9 | v | Thorax: diaphragm, small, thinning, with liver protrusion(s) |
| | | 13 | F | 3.7 | s | No abnormality detected |
| | | 14 | M | 4.1 | v | Cervical: thymus gland, bilateral, partially undescended |
| | | 15 | F | 3.7 | s | No abnormality detected |
| | | 16 | M | 3.6 | v | Cervical: thymus gland, bilateral, partially undescended<br>Thorax: innominate artery, short |
| | | 17 | F | 3.9 | s | No abnormality detected |
| 4576 | 6s, 6v | 1 | F | 3.9 | v | Cervical: thymus gland, left, partially undescended |
| | | 2 | M | 3.4 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 3 | M | 4.1 | v | No abnormality detected |
| | | 4 | M | 3.6 | s | *Sacral vertebrae: sacrocaudal vert. arch(es), incompletely ossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 5 | M | 3.9 | v | No abnormality detected |
| | | 6 | M | 4.2 | s | *Limb bones, metacarpal, 5th digit, right, unossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 12th, dumbbell ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 7 | F | 3.7 | v | No abnormality detected |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | | |
| 4576 | 6s, 6v | 8 | F | 3.5 | s | *Head bones: hyoid body, unossified*<br>*Limb bones, metacarpal, 5th digit, right, unossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 9 | F | 3.7 | v | Cervical: thymus gland, left, partially undescended |
| | | 10 | M | 4.1 | s | *Thoracic vert.: thoracic vert. centrum(a), 11th, bipartite ossified* |
| | | 11 | F | 3.7 | v | No abnormality detected |
| | | 12 | M | 4.1 | s | No abnormality detected |
| 4577 | 7s, 6v | 1 | F | 3.0 | s | *Girdles: pubis, left, incompletely ossified*<br>Sternebrae: sternebral center(s), 1st-2nd, fused<br>*Sternebrae: sternebral center(s), 4th, incompletely ossified*<br>Suture/fontanel.: frontal suture, sutural bone<br>*Thoracic vert.: thoracic vert. centrum(a), 11th, asymmetrically ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 1st, unossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 2 | M | 3.6 | v | No abnormality detected |
| | | 3 | M | 4.0 | s | *Head bones: hyoid body, unossified*<br>*Sacral vertebrae: sacrocaudal vert. arch(es), incompletely ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 4 | M | 4.6 | v | No abnormality detected |
| | | 5 | M | 4.7 | s | *Head bones: hyoid body, unossified*<br>*Limb bones: phalanx, 4 ossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | | |
| 4577 | 7s, 6v | 6 | F | 4.1 | v | No abnormality detected |
| | | 7 | F | 4.0 | s | *Head bones: hyoid body, unossified*<br>*Sacral vertebrae: sacrocaudal vert. arch(es), incompletely ossified* |
| | | 8 | M | 4.0 | v | No abnormality detected |
| | | 9 | F | 4.0 | s | No abnormality detected |
| | | 10 | F | 4.1 | v | No abnormality detected |
| | | 11 | F | 3.9 | s | No abnormality detected |
| | | 12 | F | 4.2 | v | Liver: median liver lobe, additional |
| | | 13 | F | 3.9 | s | No abnormality detected |
| 4578 | 6s, 7v | 1 | F | 4.0 | v | Head: cranial region, subcutaneous, hemorrhage(s), artifact |
| | | 2 | F | 4.2 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 3 | M | 4.6 | v | Kidney/ureter: renal papilla, right, small<br>Liver: median liver lobe, additional |
| | | 4 | F | 4.2 | s | No abnormality detected |
| | | 5 | M | 4.5 | v | Abdomen: umbilical artery, left |
| | | 6 | M | 4.3 | s | Ribs: right rib, 13th, short<br>*Variants: sternebra(e), 5th, incompletely ossified* |
| | | 7 | M | 4.5 | v | Liver: median liver lobe, additional |
| | | 8 | M | 4.1 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 9 | M | 4.7 | v | No abnormality detected |
| | | 10 | F | 3.8 | s | *Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 11 | M | 4.4 | v | No abnormality detected |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations | Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | | |
| 4578 | 6s, 7v | 12 | F | 4.2 | s | No abnormality detected |
| | | 13 | F | 4.4 | v | Liver: median liver lobe, additional<br>Head: cranial region, subcutaneous, hemorrhage(s), artifact |
| 4579 | 7s, 7v | 1 | F | 3.7 | s | *Head bones: interparietal, incompletely ossified*<br>*Head bones: parietal, bilateral, incompletely ossified*<br>Ribs: right rib, 13th, short<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 2 | F | 3.5 | v | No abnormality detected |
| | | 3 | M | 3.8 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 4 | M | 4.1 | v | No abnormality detected |
| | | 5 | F | 3.3 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 6 | M | 3.7 | v | Brain: cerebellum, subdural, small, hemorrhage(s) |
| | | 7 | M | 3.9 | s | No abnormality detected |
| | | 8 | F | 3.6 | v | No abnormality detected |
| | | 9 | M | 3.9 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 10 | F | 3.6 | v | Brain: cerebellum, subdural, hemorrhage(s) |
| | | 11 | F | 3.5 | s | *Variants: sternebra(e), 5th, unossified* |
| | | 12 | F | 3.5 | v | Thorax: diaphragm, small, thinning, with liver protrusion(s) |
| | | 13 | M | 3.7 | s | No abnormality detected |
| | | 14 | F | 3.6 | v | No abnormality detected |
| 4580 | 6s, 7v | 1 | F | 3.9 | v | No abnormality detected |
| | | 2 | F | 4.3 | s | *Thoracic vert.: thoracic vert. centrum(a), 11th-13th, incompletely ossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | | |
| 4580 | 6s, 7v | 3 | F | 3.9 | v | No abnormality detected |
| | | 4 | M | 4.3 | s | *Thoracic vert.: thoracic vert. centrum(a), 12th, dumbbell ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 4th, incompletely ossified*<br>Variants: 14th rib, bilateral, full |
| | | 5 | M | 4.3 | v | No abnormality detected |
| | | 6 | F | 4.0 | s | *Thoracic vert.: thoracic vert. centrum(a), 12th, incompletely ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 1st, unossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 9th, bipartite ossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 7 | M | 4.3 | v | Brain: cerebellum, subdural, hemorrhage(s) |
| | | 8 | F | 4.1 | s | *Head bones: hyoid body, unossified*<br>*Sacral vertebrae: sacrocaudal vert. arch(es), 2nd-4th, bilateral, unossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 1st, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 9 | M | 4.6 | v | No abnormality detected |
| | | 10 | M | 4.5 | s | No abnormality detected |
| | | 11 | F | 4.4 | v | Abdomen: abdominal cavity, hemorrhage(s), artifact |
| | | 12 | F | 4.1 | s | *Cervical vert.: cervical vert. centrum(a), 1st, ossified center*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 13 | F | 4.3 | v | No abnormality detected |
| 4581 | 7s, 6v | 1 | F | 3.8 | s | No abnormality detected |
| | | 2 | F | 4.0 | v | No abnormality detected |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | | |
| 4581 | 7s, 6v | 3 | M | 4.4 | s | *Thoracic vert.: thoracic vert. centrum(a), 9th, incompletely ossified* |
| | | 4 | F | 4.0 | v | No abnormality detected |
| | | 5 | F | 4.2 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 6 | F | 4.1 | v | Thorax: diaphragm, small, thinning, with liver protrusion(s) |
| | | 7 | F | 4.1 | s | No abnormality detected |
| | | 8 | M | 4.2 | v | No abnormality detected |
| | | 9 | F | 4.2 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 10 | M | 4.2 | v | No abnormality detected |
| | | 11 | M | 4.2 | s | *Thoracic vert.: thoracic vert. centrum(a), 10th, incompletely ossified* |
| | | 12 | F | 4.1 | v | No abnormality detected |
| | | 13 | F | 3.7 | s | No abnormality detected |
| 4582 | 1s, 1v | 1 | F | 4.4 | v | Liver: median liver lobe, additional |
| | | 2 | M | 3.8 | s | *Variants: sternebra(e), 5th, unossified* |
| 4583 | 1s | 1 | M | 3.5 | s | *Girdles: pubis, bilateral, incompletely ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 12th, incompletely ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 13th, incompletely ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 1st, unossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 2nd, incompletely ossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 5th-10th, bipartite ossified*<br>*Variants: sternebra(e), 2nd, incompletely ossified*<br>*Variants: sternebra(e), 5th, unossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | | |
| 4583 | 1s | 1 | M | 3.5 | s | *Variants: sternebra(e), 6th, unossified* |
| 4584 | 7s, 7v | 1 | F | 4.0 | v | Liver: median liver lobe, additional |
| | | 2 | F | 3.9 | s | *Head bones: hyoid body, unossified*<br>*Thoracic vert.: thoracic vert. centrum(a), 1st, incompletely ossified*<br>*Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, unossified* |
| | | 3 | F | 3.7 | v | Liver: median liver lobe, additional |
| | | 4 | M | 4.2 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 5 | M | 4.5 | v | No abnormality detected |
| | | 6 | F | 4.2 | s | No abnormality detected |
| | | 7 | M | 4.3 | v | Liver: median liver lobe, additional |
| | | 8 | M | 4.1 | s | *Head bones: hyoid body, unossified* |
| | | 9 | F | 3.9 | v | No abnormality detected |
| | | 10 | M | 4.2 | s | No abnormality detected |
| | | 11 | F | 3.9 | v | Liver: median liver lobe, additional |
| | | 12 | F | 3.9 | s | No abnormality detected |
| | | 13 | F | 4.4 | v | Liver: median liver lobe, additional |
| | | 14 | M | 4.4 | s | No abnormality detected |
| 4585 | 6s, 6v | 1 | F | 3.7 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 2 | F | 3.3 | v | No abnormality detected |
| | | 3 | M | 3.9 | s | *Head bones: parietal, bilateral, incompletely ossified*<br>*Head bones: squamosal, left, incompletely ossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | | |
| 4585 | 6s, 6v | 3 | M | 3.9 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 4 | M | 4.1 | v | No abnormality detected |
| | | 5 | F | 3.9 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 6 | M | 4.4 | v | No abnormality detected |
| | | 7 | M | 4.1 | s | No abnormality detected |
| | | 8 | F | 3.9 | v | No abnormality detected |
| | | 9 | M | 3.7 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 10 | F | 3.8 | v | No abnormality detected |
| | | 11 | M | 3.9 | s | *Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 12 | F | 3.3 | v | No abnormality detected |
| 4586 | 7s, 7v | 1 | M | 3.6 | v | Limbs: left forelimb, hemorrhage(s), artifact |
| | | 2 | M | 3.8 | s | *Thoracic vert.: thoracic vert. centrum(a), 10th-13th, incompletely ossified* |
| | | 3 | F | 3.7 | v | No abnormality detected |
| | | 4 | F | 3.6 | s | No abnormality detected |
| | | 5 | F | 3.3 | v | Abdomen: abdominal region, subcutaneous, edema |
| | | 6 | M | 4.2 | s | No abnormality detected |
| | | 7 | M | 4.0 | v | No abnormality detected |
| | | 8 | M | 4.1 | s | No abnormality detected |
| | | 9 | M | 4.0 | v | No abnormality detected |
| | | 10 | F | 3.9 | s | *Variants: sternebra(e), 6th, incompletely ossified* |
| | | 11 | F | 3.7 | v | Liver: median liver lobe, additional |
| | | 12 | M | 4.1 | s | No abnormality detected |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | | |
| 4586 | 7s, 7v | 13 | M | 4.2 | v | No abnormality detected |
| | | 14 | F | 3.2 | s | *Thoracic vert.: thoracic vert. centrum(a), 1st, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| 4587 | 8s, 7v | 1 | M | 4.7 | s | *Cervical vert.: cervical vert. centrum(a), 3rd-7th, ossified center* |
| | | 2 | F | 4.2 | v | No abnormality detected |
| | | 3 | F | 4.5 | s | No abnormality detected |
| | | 4 | F | 4.3 | v | No abnormality detected |
| | | 5 | F | 4.2 | s | *Cervical vert.: cervical vert. centrum(a), 1st-2nd, ossified center*<br>*Cervical vert.: cervical vert. centrum(a), 4th-7th, ossified center*<br>*Thoracic vert.: thoracic vert. centrum(a), 6th, incompletely ossified* |
| | | 6 | F | 4.1 | v | No abnormality detected |
| | | 7 | F | 3.8 | s | No abnormality detected |
| | | 8 | F | 4.4 | v | No abnormality detected |
| | | 9 | M | 4.4 | s | No abnormality detected |
| | | 10 | F | 4.0 | v | No abnormality detected |
| | | 11 | F | 3.3 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 12 | F | 4.6 | v | No abnormality detected |
| | | 13 | F | 4.0 | s | No abnormality detected |
| | | 14 | M | 4.5 | v | Abdomen: testis, left, malpositioned |
| | | 15 | M | 4.3 | s | No abnormality detected |
| 4588 | 7s, 8v | 1 | M | 3.9 | v | No abnormality detected |
| | | 2 | M | 4.2 | s | *Cervical vert.: cervical vert. centrum(a), 5 ossified* |

Individual Fetal Observations | Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | | |
| 4588 | 7s, 8v | 3 | F | 3.7 | v | No abnormality detected |
| | | 4 | F | 4.0 | s | *Limb bones: phalanx, 3 ossified* |
| | | 5 | M | 3.8 | v | No abnormality detected |
| | | 6 | F | 3.7 | s | No abnormality detected |
| | | 7 | F | 3.8 | v | No abnormality detected |
| | | 8 | F | 3.8 | s | No abnormality detected |
| | | 9 | M | 3.7 | v | No abnormality detected |
| | | 10 | M | 4.0 | s | *Cervical vert.: cervical vert. centrum(a), 5 ossified* |
| | | 11 | F | 4.0 | v | No abnormality detected |
| | | 12 | M | 3.7 | s | *Limb bones: phalanx, 1 ossified*<br>Variants: 14th rib, left, short |
| | | 13 | M | 4.1 | v | No abnormality detected |
| | | 14 | M | 4.1 | s | No abnormality detected |
| | | 15 | M | 3.9 | v | Kidney/ureter: renal pelvis, right, dilated |
| 4589 | 9s, 8v | 1 | M | 4.1 | s | *Head bones: hyoid body, unossified* |
| | | 2 | M | 4.2 | v | Abdomen: testis, right, malpositioned |
| | | 3 | M | 3.9 | s | No abnormality detected |
| | | 4 | F | 4.0 | v | Abdomen: abdominal cavity, hemorrhage(s), artifact |
| | | 5 | M | 3.9 | s | No abnormality detected |
| | | 6 | M | 4.1 | v | Liver: median liver lobe, additional |
| | | 7 | F | 3.8 | s | No abnormality detected |
| | | 8 | F | 4.0 | v | Liver: median liver lobe, additional |
| | | 9 | F | 4.0 | s | No abnormality detected |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | | |
| 4589 | 9s, 8v | 10 | M | 3.8 | v | No abnormality detected |
| | | 11 | M | 3.9 | s | *Head bones: hyoid body, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 12 | M | 3.6 | v | No abnormality detected |
| | | 13 | M | 4.0 | s | *Head bones: hyoid body, unossified* |
| | | 14 | M | 4.0 | v | No abnormality detected |
| | | 15 | F | 3.7 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 16 | M | 4.2 | v | No abnormality detected |
| | | 17 | M | 4.0 | s | No abnormality detected |
| 4590 | 6s, 7v | 1 | M | 3.6 | v | Cervical: thymus gland, bilateral, partially undescended |
| | | 2 | M | 3.5 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 3 | F | 3.7 | v | No abnormality detected |
| | | 4 | F | 2.8 | s | *Girdles: ischium, bilateral, incompletely ossified*<br>*Girdles: pubis, bilateral, incompletely ossified*<br>*Variants: sternebra(e), 6th, unossified* |
| | | 5 | F | 3.3 | v | Abdomen: abdominal cavity, hemorrhage(s), artifact |
| | | 6 | M | 3.8 | s | No abnormality detected |
| | | 7 | F | 3.8 | v | No abnormality detected |
| | | 8 | M | 4.1 | s | No abnormality detected |
| | | 9 | M | 4.2 | v | No abnormality detected |
| | | 10 | M | 3.8 | s | No abnormality detected |
| | | 11 | F | 3.7 | v | No abnormality detected |
| | | 12 | M | 4.0 | s | No abnormality detected |

s = skeletal; v = visceral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | | |
| 4590 | 6s, 7v | 13 | F | 3.6 | v | No abnormality detected |
| 4591 | 7s, 7v | 1 | F | 3.6 | s | *Head bones: hyoid body, unossified*<br>*Limb bones, metacarpal, 5th digit, left, unossified* |
| | | 2 | F | 3.5 | v | No abnormality detected |
| | | 3 | F | 3.9 | s | *Limb bones, metacarpal, 5th digit, right, unossified* |
| | | 4 | M | 4.0 | v | Abdomen: testis, right, malpositioned |
| | | 5 | F | 3.4 | s | *Limb bones, metacarpal, 5th digit, bilateral, unossified* |
| | | 6 | F | 3.9 | v | Brain: medulla oblongata, right, hemorrhage(s) |
| | | 7 | M | 3.8 | s | *Cervical vert.: cervical vert. centrum(a), 6 ossifed*<br>*Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 8 | F | 3.6 | v | No abnormality detected |
| | | 9 | M | 4.0 | s | *Cervical vert.: cervical vert. centrum(a), 6 ossifed* |
| | | 10 | M | 4.2 | v | Abdomen: abdominal cavity, hemorrhage(s), artifact |
| | | 11 | M | 4.3 | s | *Cervical vert.: cervical vert. centrum(a), 6 ossifed*<br>*Limb bones, metacarpal, 5th digit, left, unossified* |
| | | 12 | F | 3.8 | v | Abdomen: abdominal cavity, hemorrhage(s), artifact |
| | | 13 | M | 4.1 | s | *Limb bones, metacarpal, 5th digit, left, unossified* |
| | | 14 | M | 3.5 | v | No abnormality detected |
| 4593 | 5s, 5v | 1 | F | 4.1 | s | *Variants: sternebra(e), 5th, unossified* |
| | | 2 | M | 4.0 | v | No abnormality detected |
| | | 3 | F | 3.9 | s | *Variants: sternebra(e), 5th, unossified* |

s = skeletal; v = visceral; vert. = vertebra(e)/vertebral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | | |
| 4593 | 5s, 5v | 4 | M | 4.2 | v | No abnormality detected |
| | | 5 | F | 3.8 | s | *Limb bones, metacarpal, 5th digit, bilateral, unossified*<br>*Variants: sternebra(e), 5th, unossified* |
| | | 6 | F | 4.0 | v | Liver: median liver lobe, additional |
| | | 7 | F | 3.7 | s | *Variants: sternebra(e), 6th, unossified* |
| | | 8 | F | 3.1 | v | Liver: median liver lobe, additional |
| | | 9 | M | 4.1 | s | No abnormality detected |
| | | 10 | F | 3.7 | v | Liver: median liver lobe, additional |
| 4594 | 7s, 8v | 1 | M | 4.3 | v | Liver: median liver lobe, additional |
| | | 2 | M | 4.1 | s | No abnormality detected |
| | | 3 | M | 4.0 | v | Thorax: diaphragm, small, thinning, with liver protrusion(s) |
| | | 4 | M | 4.3 | s | No abnormality detected |
| | | 5 | M | 4.1 | v | Thorax: diaphragm, thinning, with liver protrusion(s) |
| | | 6 | M | 4.2 | s | *Limb bones: phalanx, 2 ossified* |
| | | 7 | F | 3.1 | v | No abnormality detected |
| | | 8 | F | 3.7 | s | *Variants: sternebra(e), 5th, incompletely ossified* |
| | | 9 | M | 3.9 | v | Abdomen: testis, right, malpositioned<br>Kidney/ureter: renal pelvis, bilateral, dilated<br>Kidney/ureter: ureter, bilateral, dilated |
| | | 10 | M | 3.9 | s | No abnormality detected |
| | | 11 | F | 3.9 | v | Abdomen: abdominal cavity, hemorrhage(s), artifact |
| | | 12 | M | 3.8 | s | No abnormality detected |
| | | 13 | M | 4.3 | v | No abnormality detected |

s = skeletal; v = visceral

Individual Fetal Observations — Appendix J

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | | |
| 4594 | 7s, 8v | 14 | F | 3.7 | s | No abnormality detected |
| | | 15 | M | 3.8 | v | No abnormality detected |
| 4595 | 8s, 7v | 1 | F | 3.8 | s | *Limb bones: phalanx, 4 ossified* |
| | | 2 | M | 4.8 | v | No abnormality detected |
| | | 3 | M | 4.4 | s | *Limb bones: phalanx, 4 ossified*<br>*Variants: sternebra(e), 5th, unossified* |
| | | 4 | M | 4.2 | v | No abnormality detected |
| | | 5 | F | 3.8 | s | *Variants: sternebra(e), 5th, unossified* |
| | | 6 | M | 4.4 | v | Thorax: diaphragm, small, thinning, with liver protrusion(s) |
| | | 7 | F | 3.8 | s | *Variants: sternebra(e), 5th, unossified*<br>*Variants: sternebra(e), 6th, incompletely ossified* |
| | | 8 | M | 4.2 | v | No abnormality detected |
| | | 9 | F | 3.8 | s | *Limb bones: phalanx, 2 ossified* |
| | | 10 | M | 4.2 | v | No abnormality detected |
| | | 11 | M | 4.0 | s | *Limb bones: phalanx, 4 ossified* |
| | | 12 | M | 4.5 | v | No abnormality detected |
| | | 13 | F | 4.2 | s | *Limb bones: phalanx, 4 ossified*<br>Variants: 14th rib, bilateral, short |
| | | 14 | F | 4.0 | v | No abnormality detected |
| | | 15 | F | 4.1 | s | *Limb bones: phalanx, 4 ossified* |
| 4596 | 6s, 6v | 0 | U | 0.0 | s | No abnormality detected |
| | | 1 | F | 3.6 | v | No abnormality detected |

s = skeletal; v = visceral

| | Individual Fetal Observations | Appendix J |
|---|---|---|

| Animal Number | Exams | Fetus | Sex | Weight (g) | Fate | Abnormalities<br>Major in CAPITALS, external underlined, ossification in *italics* |
|---|---|---|---|---|---|---|
| Group 4 - 20000 mg/m3 | | | | | | |
| 4596 | 6s, 6v | 2 | F | 4.0 | s | No abnormality detected |
| | | 3 | M | 3.9 | v | Thorax: innominate artery, short |
| | | 4 | F | 4.1 | s | *Variants: sternebra(e), 5th, unossified* |
| | | 5 | M | 4.1 | v | No abnormality detected |
| | | 6 | M | 4.3 | s | *Head bones: interparietal, incompletely ossified* |
| | | 7 | M | 4.1 | v | No abnormality detected |
| | | 8 | M | 4.2 | s | No abnormality detected |
| | | 9 | F | 4.1 | v | No abnormality detected |
| | | 10 | M | 4.4 | s | *Variants: sternebra(e), 5th, unossified* |
| | | 11 | F | 3.9 | v | No abnormality detected |
| | | 12 | F | 3.6 | s | *Variants: sternebra(e), 6th, incompletely ossified* |

s = skeletal; v = visceral

| | Scientists and Supervising Personnel | Appendix K |
|---|---|---|

| TITLE/DEPARTMENT | NAME/DEGREE |
|---|---|
| VICE PRESIDENT, SAFETY ASSESSMENT | Catherine M. Kelly, BS |
| VICE PRESIDENT, BIOANALYTICAL AND TRANSLATIONAL SCIENCES | Nicki Iacono, BS |
| VICE PRESIDENT, TOXICOLOGY OPERATIONS | Ian Vanterpool, FIAT |
| DIRECTOR, DEVELOPMENTAL AND REPRODUCTIVE TOXICOLOGY | Robert M. Parker, PhD, DABT |
| DIRECTOR, QUALITY ASSURANCE | Melissa Elliott, BS, RQAP-GLP |
| STUDY DIRECTOR | Gary M. Hoffman, BA, DABT |
| REPORT WRITERS | Kathy Smith, AAS<br>Nicole Moody, BS |
| VETERINARIAN | Teresa S. Kusznir, VMD |
| MANAGER/SUPERVISOR | |
| Rodent/Reproductive Toxicology | Thomas Jones, BS, AALAS LATG |
| Inhalation Toxicology | Justine Damiano, BS |
| Pharmacy | Michael S. McCarthy |
| Sample Logistics, Necropsy, Fetal Pathology and Histology | Lakisha Key-Faulk, BS |
| **CONTRIBUTING SCIENTISTS** | |
| DOSE FORMULATION ANALYSIS | Yonggang Wang, MA |
| AEROSOL TECHNOLOGIST | Justine Damiano, BS |

# Annex 1 Gasoline Analysis

108_141022_002 VC-Run 1970 distillate batch 1.txt
CHEVRON RESEARCH GASOLINE ANALYSIS
ASTM DHAX METHOD

Sample ID: VC-Run 1970 distillate batch 1
Acquisition Date & Time: 10/22/2014 9:32:40 AM
Channel: C108 (Offline)
Analysis: 108_141022_002.dat

*** DETAILED COMPOSITION, PERCENT ***

| C NO. | PARA | OLEF | NAPH | AROM | UNCL HC | TOTALS BY C # | NORMAL PARA | NON-ALKYL I-PARA | ALKYL I-PARA | CYCLO-PENT | CYCLO-HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| => BY WEIGHT | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 7.14 | **** | **** | **** | 2.82 | 9.97 | 0.30 | 6.84 | **** | **** | **** |
| 5 | 66.96 | **** | 4.97 | **** | **** | 71.93 | 0.20 | 66.76 | **** | 4.97 | **** |
| 6 | 3.68 | **** | 0.22 | **** | **** | 3.90 | 0.60 | 3.07 | **** | 0.18 | 0.04 |
| 7 | 0.98 | **** | 0.01 | **** | **** | 1.00 | **** | 0.98 | **** | **** | 0.01 |
| 8 | 12.91 | **** | 0.13 | **** | **** | 13.03 | 0.03 | 0.50 | 12.37 | **** | 0.13 |
| 9 | 0.02 | **** | 0.07 | 0.09 | **** | 0.18 | 0.01 | 0.01 | **** | 0.02 | 0.05 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 91.69 | **** | 5.40 | 0.09 | 2.82 | 100.00 | 1.15 | 78.17 | 12.37 | 5.18 | 0.22 |
| => BY VOLUME | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 8.12 | **** | **** | **** | 2.29 | 10.41 | 0.33 | 7.79 | **** | **** | **** |
| 5 | 68.72 | **** | 4.25 | **** | **** | 72.97 | 0.20 | 68.52 | **** | 4.25 | **** |
| 6 | 3.58 | **** | 0.19 | **** | **** | 3.77 | 0.58 | 3.00 | **** | 0.16 | 0.03 |
| 7 | 0.91 | **** | 0.01 | **** | **** | 0.92 | **** | 0.91 | **** | **** | 0.01 |
| 8 | 11.69 | **** | 0.10 | **** | **** | 11.79 | 0.03 | 0.46 | 11.20 | **** | 0.10 |
| 9 | 0.02 | **** | 0.06 | 0.07 | **** | 0.14 | 0.01 | 0.01 | **** | 0.02 | 0.04 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 93.04 | **** | 4.60 | 0.07 | 2.29 | 100.00 | 1.15 | 80.69 | 11.20 | 4.42 | 0.18 |
| => BY MOLAR | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 9.16 | **** | **** | **** | 3.62 | 12.78 | 0.38 | 8.78 | **** | **** | **** |
| 5 | 69.19 | **** | 5.28 | **** | **** | 74.48 | 0.21 | 68.99 | **** | 5.28 | **** |
| 6 | 3.18 | **** | 0.20 | **** | **** | 3.38 | 0.52 | 2.66 | **** | 0.16 | 0.03 |
| 7 | 0.73 | **** | 0.01 | **** | **** | 0.74 | **** | 0.73 | **** | **** | 0.01 |
| 8 | 8.42 | **** | 0.08 | **** | **** | 8.51 | 0.02 | 0.33 | 8.08 | **** | 0.08 |
| 9 | 0.01 | **** | 0.04 | 0.06 | **** | 0.11 | 0.01 | 0.01 | **** | 0.01 | 0.03 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 90.71 | **** | 5.61 | 0.06 | 3.62 | 100.00 | 1.14 | 81.49 | 8.08 | 5.46 | 0.15 |

GRP. TYPE, VOL %: P = 95.22, O = 0.00, N = 4.71, A = 0.07, Saturates = 99.93
DIENE CONTENT = 0 vol ppm AVG MW= 74.6 API GR.= 89.2 SP. GR.= 0.6411
OCTANE NUMBER: (from pure values) RON = 94.0 MON = 90.9
(from blending values) RON = 92.5 MON = 88.4
CARBON-HYDROGEN RATIO = 5.041 STOICH. AIR-FUEL RATIO = 15.25 lbs air/lbs fuel
BTU/lb = 19253 NET, 20735 GROSS; BTU/gal = 103002 NET, 110929 GROSS
REID VAPOR PRESSURE = 21.7 BROMINE NO. = 0.0

* DISTILLATION CURVES

108_141022_002 VC-Run 1970 distillate batch 1.txt

| VOL % | TBP | D86 |
|---|---|---|
| 0 | 11 | 83 |
| 5 | 11 | 83 |
| 10 | 82 | 83 |
| 15 | 82 | 83 |
| 20 | 82 | 83 |
| 25 | 82 | 83 |
| 30 | 82 | 83 |
| 35 | 82 | 83 |
| 40 | 82 | 83 |
| 45 | 82 | 83 |
| 50 | 82 | 83 |
| 55 | 82 | 83 |
| 60 | 82 | 83 |
| 65 | 82 | 83 |
| 70 | 82 | 83 |
| 75 | 82 | 83 |
| 80 | 121 | 121 |
| 85 | 181 | 181 |
| 90 | 211 | 210 |
| 95 | 211 | 238 |
| 100 | 337 | 238 |

* COMPOUND DICTIONARY NUMBERS AND AREAS AS READ IN

| CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 157883 | 4 | 6872 | 8 | 4974 | 7 | 1546917 | 6 | 4632 |
| 12 | 52022 | 800 | 118832 | 13 | 1771 | 10 | 9361 | 11 | 8555 |
| 9 | 14122 | 801 | 4383 | 18 | 854 | 20 | 1176 | 1009 | 59009 |
| 825 | 896 | 19 | 13594 | 15 | 4269 | 16 | 3166 | 37 | 184060 |
| 826 | 262 | 36 | 2298 | 31 | 6287 | 30 | 4663 | 39 | 3308 |
| 38 | 100926 | 34 | 430 | 24 | 400 | 831 | 1218 | 848 | 546 |
| 830 | 595 | 832 | 427 | 23 | 685 | 827 | 817 | 946 | 297 |
| 956 | 496 | 61 | 213 | 941 | 290 | 41 | 342 | 609 | 697 |
| 610 | 417 | 613 | 329 | 612 | 866 | | | | |

TOTAL UNCORRECTED AREA = 2324157
NUMBER OF PEAKS READ IN = 43

* DETAILED HYDROCARBON ANALYSIS, EXCLUDING COMPOUNDS BELOW 0.01 VOLUME PERCENT

NORMAL PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4 | 0.38 | 0.33 | 0.30 | N-BUTANE |
| 6 | 0.21 | 0.20 | 0.20 | N-PENTANE |
| 9 | 0.52 | 0.58 | 0.60 | N-HEXANE |
| 23 | 0.02 | 0.03 | 0.03 | N-OCTANE |
| 41 | 0.01 | 0.01 | 0.01 | N-NONANE |

ISO-PARAFFINS

108_141022_002 VC-Run 1970 distillate batch 1.txt

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 5 | 8.78 | 7.79 | 6.84 | ISOBUTANE | |
| 8 | 0.22 | 0.23 | 0.21 | 22-DIME PROPANE | |
| 7 | 68.77 | 68.29 | 66.54 | ISOPENTANE | |
| 12 | 1.93 | 2.18 | 2.23 | 22-DIME BUTANE | |
| 13 | 0.07 | 0.07 | 0.08 | 23-DIME BUTANE | |
| 10 | 0.35 | 0.39 | 0.40 | 2-ME PENTANE | |
| 11 | 0.32 | 0.35 | 0.37 | 3-ME PENTANE | |
| 18 | 0.03 | 0.03 | 0.04 | 22-DIME PENTANE | |
| 20 | 0.04 | 0.05 | 0.05 | 24-DIME PENTANE | |
| 19 | 0.43 | 0.53 | 0.58 | 23-DIME PENTANE | |
| 15 | 0.14 | 0.17 | 0.18 | 2-ME HEXANE | |
| 16 | 0.10 | 0.13 | 0.14 | 3-ME HEXANE | |
| 37 | 5.12 | 7.22 | 7.84 | 224-TRIME PENTANE | * |
| 36 | 0.06 | 0.09 | 0.10 | 223-TRIME PENTANE | * |
| 31 | 0.17 | 0.25 | 0.27 | 25-DIME HEXANE | |
| 30 | 0.13 | 0.18 | 0.20 | 24-DIME HEXANE | |
| 39 | 0.09 | 0.12 | 0.14 | 234-TRIME PENTANE | * |
| 38 | 2.81 | 3.77 | 4.30 | 233-TRIME PENTANE | * |
| 34 | 0.01 | 0.02 | 0.02 | 2-ME-3-ET PENTANE | |
| 24 | 0.01 | 0.02 | 0.02 | 2-ME HEPTANE | |

CYCLOPENTANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 800 | 5.28 | 4.25 | 4.97 | CYCLOPENTANE |
| 801 | 0.16 | 0.16 | 0.18 | ME CYCLOPENTANE |
| 848 | 0.01 | 0.02 | 0.02 | 113T4-TETRME CPENT |

CYCLOHEXANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 825 | 0.03 | 0.03 | 0.04 | CYCLOHEXANE |
| 831 | 0.03 | 0.04 | 0.05 | 1C3-DIME CYCHEXANE |
| 830 | 0.02 | 0.02 | 0.02 | 1T2-DIME CYCHEXANE |
| 832 | 0.01 | 0.01 | 0.02 | 1T3-DIME CYCHEXANE |
| 827 | 0.02 | 0.03 | 0.03 | ETHYL CYCLOHEXANE |
| 946 | 0.01 | 0.01 | 0.01 | 113-TRIME CYCHEXANE |
| 956 | 0.01 | 0.02 | 0.02 | 1C3T5-TRIME CYCHEX |

AROMATIC HCS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 609 | 0.02 | 0.02 | 0.03 | 1-ME-3-ET BENZENE | |
| 610 | 0.01 | 0.01 | 0.02 | 1-ME-4-ET BENZENE | |
| 612 | 0.02 | 0.03 | 0.03 | 124-TRIME BENZENE | * |

UNCLASSIFIED HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 1009 | 3.62 | 2.29 | 2.82 | ISOBUTANOL |

108_141022_006 VC-Run 1972 distillate batch 2.txt
CHEVRON RESEARCH GASOLINE ANALYSIS
ASTM DHAX METHOD

Sample ID: VC-Run 1972 distillate batch 2
Acquisition Date & Time: 10/23/2014 10:58:20 AM
Channel: C108 (Offline)
Analysis: 108_141022_006.dat

*** DETAILED COMPOSITION, PERCENT ***

| C NO. | PARA | OLEF | NAPH | AROM | UNCL HC | TOTALS BY C # | NORMAL PARA | NON-ALKYL I-PARA | ALKYL I-PARA | CYCLO-PENT | CYCLO-HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| => BY WEIGHT | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 6.41 | **** | **** | **** | 3.03 | 9.44 | 0.27 | 6.14 | **** | **** | **** |
| 5 | 66.46 | **** | 5.21 | **** | **** | 71.67 | 0.20 | 66.26 | **** | 5.21 | **** |
| 6 | 3.89 | **** | 0.24 | **** | **** | 4.13 | 0.64 | 3.25 | **** | 0.20 | 0.04 |
| 7 | 1.04 | **** | 0.02 | **** | **** | 1.06 | 0.01 | 1.03 | **** | **** | 0.02 |
| 8 | 13.35 | **** | 0.13 | **** | **** | 13.48 | 0.03 | 0.52 | 12.81 | **** | 0.13 |
| 9 | 0.03 | **** | 0.07 | 0.11 | **** | 0.21 | 0.02 | 0.01 | **** | 0.02 | 0.05 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 91.18 | **** | 5.67 | 0.11 | 3.03 | 100.00 | 1.16 | 77.22 | 12.81 | 5.43 | 0.24 |
| => BY VOLUME | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 7.31 | **** | **** | **** | 2.46 | 9.77 | 0.30 | 7.00 | **** | **** | **** |
| 5 | 68.38 | **** | 4.46 | **** | **** | 72.84 | 0.20 | 68.18 | **** | 4.46 | **** |
| 6 | 3.81 | **** | 0.20 | **** | **** | 4.01 | 0.62 | 3.19 | **** | 0.17 | 0.03 |
| 7 | 0.97 | **** | 0.02 | **** | **** | 0.98 | 0.01 | 0.96 | **** | **** | 0.02 |
| 8 | 12.12 | **** | 0.11 | **** | **** | 12.23 | 0.02 | 0.47 | 11.62 | **** | 0.11 |
| 9 | 0.02 | **** | 0.06 | 0.08 | **** | 0.17 | 0.01 | 0.01 | **** | 0.02 | 0.04 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 92.61 | **** | 4.85 | 0.08 | 2.46 | 100.00 | 1.17 | 79.82 | 11.62 | 4.65 | 0.20 |
| => BY MOLAR | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 8.25 | **** | **** | **** | 3.90 | 12.16 | 0.35 | 7.90 | **** | **** | **** |
| 5 | 68.93 | **** | 5.56 | **** | **** | 74.49 | 0.20 | 68.73 | **** | 5.56 | **** |
| 6 | 3.38 | **** | 0.21 | **** | **** | 3.59 | 0.56 | 2.83 | **** | 0.18 | 0.04 |
| 7 | 0.78 | **** | 0.02 | **** | **** | 0.80 | 0.01 | 0.77 | **** | **** | 0.02 |
| 8 | 8.75 | **** | 0.09 | **** | **** | 8.84 | 0.02 | 0.34 | 8.39 | **** | 0.09 |
| 9 | 0.02 | **** | 0.04 | 0.07 | **** | 0.13 | 0.01 | 0.01 | **** | 0.01 | 0.03 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 90.11 | **** | 5.92 | 0.07 | 3.90 | 100.00 | 1.15 | 80.58 | 8.39 | 5.75 | 0.17 |

GRP. TYPE, VOL %: P = 94.94, O = 0.00, N = 4.97, A = 0.09, Saturates = 99.91
DIENE CONTENT = 0 vol ppm AVG MW= 74.8 API GR.= 88.7 SP. GR.= 0.6427
OCTANE NUMBER: (from pure values) RON = 93.9 MON = 90.8
(from blending values) RON = 92.4 MON = 88.3
CARBON-HYDROGEN RATIO = 5.047 STOICH. AIR-FUEL RATIO = 15.25 lbs air/lbs fuel
BTU/lb = 19244 NET, 20721 GROSS; BTU/gal = 103214 NET, 111134 GROSS
REID VAPOR PRESSURE = 21.1 BROMINE NO. = 0.0

* DISTILLATION CURVES

108_141022_006 VC-Run 1972 distillate batch 2.txt

| VOL % | TBP | D86 |
|---|---|---|
| 0 | 11 | 83 |
| 5 | 11 | 83 |
| 10 | 82 | 83 |
| 15 | 82 | 83 |
| 20 | 82 | 83 |
| 25 | 82 | 83 |
| 30 | 82 | 83 |
| 35 | 82 | 83 |
| 40 | 82 | 83 |
| 45 | 82 | 83 |
| 50 | 82 | 83 |
| 55 | 82 | 83 |
| 60 | 82 | 83 |
| 65 | 82 | 83 |
| 70 | 82 | 83 |
| 75 | 82 | 121 |
| 80 | 121 | 122 |
| 85 | 181 | 181 |
| 90 | 211 | 210 |
| 95 | 211 | 238 |
| 100 | 337 | 238 |

* COMPOUND DICTIONARY NUMBERS AND AREAS AS READ IN

| CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 130396 | 4 | 5810 | 8 | 4200 | 7 | 1414759 | 6 | 4207 |
| 12 | 50546 | 800 | 114700 | 13 | 1805 | 10 | 9195 | 11 | 8453 |
| 9 | 13760 | 801 | 4346 | 18 | 936 | 20 | 1124 | 1009 | 58347 |
| 825 | 918 | 19 | 12986 | 15 | 4080 | 16 | 3176 | 37 | 175723 |
| 14 | 202 | 826 | 474 | 36 | 2155 | 31 | 5955 | 30 | 4460 |
| 39 | 3035 | 38 | 96086 | 34 | 438 | 24 | 358 | 831 | 1086 |
| 848 | 512 | 830 | 519 | 832 | 417 | 23 | 584 | 827 | 912 |
| 946 | 290 | 956 | 488 | 61 | 209 | 941 | 268 | 41 | 360 |
| 609 | 765 | 610 | 389 | 613 | 372 | 608 | 177 | 612 | 913 |

TOTAL UNCORRECTED AREA = 2140891
NUMBER OF PEAKS READ IN = 45

* DETAILED HYDROCARBON ANALYSIS, EXCLUDING COMPOUNDS BELOW 0.01 VOLUME PERCENT

NORMAL PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4 | 0.35 | 0.30 | 0.27 | N-BUTANE |
| 6 | 0.20 | 0.20 | 0.20 | N-PENTANE |
| 9 | 0.56 | 0.62 | 0.64 | N-HEXANE |
| 23 | 0.02 | 0.02 | 0.03 | N-OCTANE |
| 41 | 0.01 | 0.01 | 0.02 | N-NONANE |

108_141022_006 VC-Run 1972 distillate batch 2.txt

ISO-PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 5 | 7.90 | 7.00 | 6.14 | ISOBUTANE | |
| 8 | 0.20 | 0.21 | 0.20 | 22-DIME PROPANE | |
| 7 | 68.53 | 67.97 | 66.07 | ISOPENTANE | |
| 12 | 2.04 | 2.31 | 2.35 | 22-DIME BUTANE | |
| 13 | 0.07 | 0.08 | 0.08 | 23-DIME BUTANE | |
| 10 | 0.37 | 0.42 | 0.43 | 2-ME PENTANE | |
| 11 | 0.34 | 0.38 | 0.39 | 3-ME PENTANE | |
| 18 | 0.03 | 0.04 | 0.04 | 22-DIME PENTANE | |
| 20 | 0.04 | 0.05 | 0.05 | 24-DIME PENTANE | |
| 19 | 0.45 | 0.55 | 0.60 | 23-DIME PENTANE | |
| 15 | 0.14 | 0.18 | 0.19 | 2-ME HEXANE | |
| 16 | 0.11 | 0.14 | 0.15 | 3-ME HEXANE | |
| 37 | 5.32 | 7.50 | 8.12 | 224-TRIME PENTANE | * |
| 36 | 0.07 | 0.09 | 0.10 | 223-TRIME PENTANE | * |
| 31 | 0.18 | 0.25 | 0.28 | 25-DIME HEXANE | |
| 30 | 0.14 | 0.19 | 0.21 | 24-DIME HEXANE | |
| 39 | 0.09 | 0.12 | 0.14 | 234-TRIME PENTANE | * |
| 38 | 2.91 | 3.91 | 4.44 | 233-TRIME PENTANE | * |
| 34 | 0.01 | 0.02 | 0.02 | 2-ME-3-ET PENTANE | |
| 24 | 0.01 | 0.02 | 0.02 | 2-ME HEPTANE | |

CYCLOPENTANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 800 | 5.56 | 4.46 | 5.21 | CYCLOPENTANE |
| 801 | 0.18 | 0.17 | 0.20 | ME CYCLOPENTANE |
| 848 | 0.01 | 0.02 | 0.02 | 113T4-TETRME CPENT |

CYCLOHEXANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 825 | 0.04 | 0.03 | 0.04 | CYCLOHEXANE |
| 826 | 0.02 | 0.02 | 0.02 | ME CYCLOHEXANE |
| 831 | 0.03 | 0.04 | 0.05 | 1C3-DIME CYCHEXANE |
| 830 | 0.02 | 0.02 | 0.02 | 1T2-DIME CYCHEXANE |
| 832 | 0.01 | 0.02 | 0.02 | 1T3-DIME CYCHEXANE |
| 827 | 0.03 | 0.03 | 0.04 | ETHYL CYCLOHEXANE |
| 946 | 0.01 | 0.01 | 0.01 | 113-TRIME CYCHEXANE |
| 956 | 0.01 | 0.02 | 0.02 | 1C3T5-TRIME CYCHEX |

AROMATIC HCS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 609 | 0.02 | 0.02 | 0.03 | 1-ME-3-ET BENZENE | |
| 610 | 0.01 | 0.01 | 0.02 | 1-ME-4-ET BENZENE | |
| 613 | 0.01 | 0.01 | 0.02 | 135-TRIME BENZENE | |
| 612 | 0.02 | 0.03 | 0.04 | 124-TRIME BENZENE | * |

UNCLASSIFIED HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 1009 | 3.90 | 2.46 | 3.03 | ISOBUTANOL |

108_141022_007 VC-Run 1973 distillate batch 3.txt
CHEVRON RESEARCH GASOLINE ANALYSIS
ASTM DHAX METHOD

Sample ID: VC-Run 1973 distillate batch 3
Acquisition Date & Time: 10/23/2014 2:43:21 PM
Channel: C108 (Offline)
Analysis: 108_141022_007.dat

*** DETAILED COMPOSITION, PERCENT ***

| C NO. | PARA | OLEF | NAPH | AROM | UNCL HC | TOTALS BY C # | NORMAL PARA | NON-ALKYL I-PARA | ALKYL I-PARA | CYCLO-PENT | CYCLO-HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| => BY WEIGHT | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 6.44 | **** | **** | **** | 2.49 | 8.93 | 0.27 | 6.17 | **** | **** | **** |
| 5 | 65.71 | **** | 5.18 | **** | **** | 70.89 | 0.20 | 65.51 | **** | 5.18 | **** |
| 6 | 3.92 | **** | 0.25 | **** | **** | 4.17 | 0.65 | 3.28 | **** | 0.20 | 0.05 |
| 7 | 1.07 | **** | **** | **** | **** | 1.07 | **** | 1.07 | **** | **** | **** |
| 8 | 14.50 | 0.05 | 0.11 | **** | **** | 14.66 | 0.03 | 0.59 | 13.89 | **** | 0.11 |
| 9 | 0.02 | **** | 0.04 | 0.12 | 0.04 | 0.23 | 0.02 | **** | **** | **** | 0.04 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.05 | 0.05 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | 0.02 | 0.02 | **** | **** | **** | **** | **** |
| TOT | 91.66 | 0.05 | 5.57 | 0.12 | 2.60 | 100.00 | 1.16 | 76.61 | 13.89 | 5.38 | 0.19 |
| => BY VOLUME | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 7.34 | **** | **** | **** | 2.02 | 9.36 | 0.29 | 7.05 | **** | **** | **** |
| 5 | 67.64 | **** | 4.44 | **** | **** | 72.08 | 0.20 | 67.44 | **** | 4.44 | **** |
| 6 | 3.84 | **** | 0.21 | **** | **** | 4.05 | 0.63 | 3.21 | **** | 0.17 | 0.04 |
| 7 | 0.99 | **** | **** | **** | **** | 0.99 | **** | 0.99 | **** | **** | **** |
| 8 | 13.17 | 0.04 | 0.09 | **** | **** | 13.29 | 0.03 | 0.54 | 12.60 | **** | 0.09 |
| 9 | 0.02 | **** | 0.03 | 0.09 | 0.04 | 0.18 | 0.02 | **** | **** | **** | 0.03 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.04 | 0.04 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** | **** |
| TOT | 92.98 | 0.04 | 4.77 | 0.09 | 2.11 | 100.00 | 1.16 | 79.22 | 12.60 | 4.61 | 0.16 |
| => BY MOLAR | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 8.34 | **** | **** | **** | 3.22 | 11.56 | 0.34 | 8.00 | **** | **** | **** |
| 5 | 68.58 | **** | 5.56 | **** | **** | 74.15 | 0.21 | 68.38 | **** | 5.56 | **** |
| 6 | 3.43 | **** | 0.22 | **** | **** | 3.65 | 0.56 | 2.86 | **** | 0.18 | 0.04 |
| 7 | 0.80 | **** | **** | **** | **** | 0.80 | **** | 0.80 | **** | **** | **** |
| 8 | 9.56 | 0.03 | 0.07 | **** | **** | 9.66 | 0.02 | 0.39 | 9.16 | **** | 0.07 |
| 9 | 0.01 | **** | 0.02 | 0.08 | 0.02 | 0.14 | 0.01 | **** | **** | **** | 0.02 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.02 | 0.02 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** | **** |
| TOT | 90.73 | 0.03 | 5.88 | 0.08 | 3.28 | 100.00 | 1.14 | 80.43 | 9.16 | 5.74 | 0.14 |

GRP. TYPE, VOL %: P = 94.99, O = 0.04, N = 4.87, A = 0.09, Saturates = 99.86
DIENE CONTENT = 0 vol ppm AVG MW= 75.3 API GR.= 88.6 SP. GR.= 0.6430
OCTANE NUMBER: (from pure values) RON = 93.8 MON = 90.8
(from blending values) RON = 92.3 MON = 88.2
CARBON-HYDROGEN RATIO = 5.053 STOICH. AIR-FUEL RATIO = 15.25 lbs air/lbs fuel
BTU/lb = 19241 NET, 20711 GROSS; BTU/gal = 103244 NET, 111130 GROSS
REID VAPOR PRESSURE = 21.0 BROMINE NO. = 0.1

* DISTILLATION CURVES

108_141022_007 VC-Run 1973 distillate batch 3.txt

| VOL % | TBP | D86 |
|---|---|---|
| 0 | 11 | 83 |
| 5 | 11 | 83 |
| 10 | 82 | 83 |
| 15 | 82 | 83 |
| 20 | 82 | 83 |
| 25 | 82 | 83 |
| 30 | 82 | 83 |
| 35 | 82 | 83 |
| 40 | 82 | 83 |
| 45 | 82 | 83 |
| 50 | 82 | 83 |
| 55 | 82 | 83 |
| 60 | 82 | 83 |
| 65 | 82 | 83 |
| 70 | 82 | 83 |
| 75 | 121 | 121 |
| 80 | 122 | 122 |
| 85 | 181 | 194 |
| 90 | 211 | 210 |
| 95 | 230 | 238 |
| 100 | 390 | 238 |

* COMPOUND DICTIONARY NUMBERS AND AREAS AS READ IN

| CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 97641 | 4 | 4205 | 8 | 2995 | 7 | 1041310 | 6 | 3133 |
| 12 | 37798 | 800 | 84961 | 13 | 1366 | 10 | 7021 | 11 | 6291 |
| 9 | 10339 | 801 | 3312 | 18 | 669 | 20 | 881 | 1009 | 35632 |
| 825 | 781 | 19 | 10030 | 15 | 3182 | 16 | 2349 | 37 | 138725 |
| 36 | 1727 | 31 | 4825 | 30 | 3565 | 39 | 3541 | 38 | 79637 |
| 4527 | 786 | 34 | 252 | 26 | 815 | 831 | 346 | 830 | 406 |
| 832 | 400 | 23 | 461 | 827 | 572 | 946 | 250 | 189 | 685 |
| 956 | 386 | 41 | 333 | 609 | 626 | 610 | 364 | 613 | 359 |
| 612 | 794 | 191 | 828 | 4104 | 273 | | | | |

TOTAL UNCORRECTED AREA = 1594852
NUMBER OF PEAKS READ IN = 43

* DETAILED HYDROCARBON ANALYSIS, EXCLUDING COMPOUNDS BELOW 0.01 VOLUME PERCENT

NORMAL PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4 | 0.34 | 0.29 | 0.27 | N-BUTANE |
| 6 | 0.21 | 0.20 | 0.20 | N-PENTANE |
| 9 | 0.56 | 0.63 | 0.65 | N-HEXANE |
| 23 | 0.02 | 0.03 | 0.03 | N-OCTANE |
| 41 | 0.01 | 0.02 | 0.02 | N-NONANE |

ISO-PARAFFINS

108_141022_007 VC-Run 1973 distillate batch 3.txt

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 5 | 8.00 | 7.05 | 6.17 | ISOBUTANE | |
| 8 | 0.20 | 0.20 | 0.19 | 22-DIME PROPANE | |
| 7 | 68.18 | 67.23 | 65.32 | ISOPENTANE | |
| 12 | 2.06 | 2.32 | 2.36 | 22-DIME BUTANE | |
| 13 | 0.07 | 0.08 | 0.09 | 23-DIME BUTANE | |
| 10 | 0.38 | 0.43 | 0.44 | 2-ME PENTANE | |
| 11 | 0.34 | 0.38 | 0.39 | 3-ME PENTANE | |
| 18 | 0.03 | 0.04 | 0.04 | 22-DIME PENTANE | |
| 20 | 0.04 | 0.05 | 0.05 | 24-DIME PENTANE | |
| 19 | 0.47 | 0.57 | 0.62 | 23-DIME PENTANE | |
| 15 | 0.15 | 0.19 | 0.20 | 2-ME HEXANE | |
| 16 | 0.11 | 0.14 | 0.15 | 3-ME HEXANE | |
| 37 | 5.68 | 7.96 | 8.62 | 224-TRIME PENTANE | * |
| 36 | 0.07 | 0.10 | 0.11 | 223-TRIME PENTANE | * |
| 31 | 0.20 | 0.28 | 0.30 | 25-DIME HEXANE | |
| 30 | 0.15 | 0.20 | 0.22 | 24-DIME HEXANE | |
| 39 | 0.14 | 0.20 | 0.22 | 234-TRIME PENTANE | * |
| 38 | 3.26 | 4.35 | 4.95 | 233-TRIME PENTANE | * |
| 34 | 0.01 | 0.01 | 0.02 | 2-ME-3-ET PENTANE | |
| 26 | 0.03 | 0.05 | 0.05 | 4-ME HEPTANE | |

CYCLOPENTANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 800 | 5.56 | 4.44 | 5.18 | CYCLOPENTANE |
| 801 | 0.18 | 0.17 | 0.20 | ME CYCLOPENTANE |

CYCLOHEXANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 825 | 0.04 | 0.04 | 0.05 | CYCLOHEXANE |
| 831 | 0.01 | 0.02 | 0.02 | 1C3-DIME CYCHEXANE |
| 830 | 0.02 | 0.02 | 0.02 | 1T2-DIME CYCHEXANE |
| 832 | 0.02 | 0.02 | 0.02 | 1T3-DIME CYCHEXANE |
| 827 | 0.02 | 0.03 | 0.03 | ETHYL CYCLOHEXANE |
| 946 | 0.01 | 0.01 | 0.02 | 113-TRIME CYCHEXANE |
| 956 | 0.01 | 0.02 | 0.02 | 1C3T5-TRIME CYCHEX |

OLEFINS, DIENES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4527 | 0.03 | 0.04 | 0.05 | OCTENE C |

AROMATIC HCS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 609 | 0.02 | 0.03 | 0.04 | 1-ME-3-ET BENZENE | |
| 610 | 0.01 | 0.02 | 0.02 | 1-ME-4-ET BENZENE | |
| 613 | 0.01 | 0.02 | 0.02 | 135-TRIME BENZENE | |
| 612 | 0.03 | 0.03 | 0.05 | 124-TRIME BENZENE | * |

UNCLASSIFIED HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 1009 | 3.22 | 2.02 | 2.49 | ISOBUTANOL |
| 189 | 0.02 | 0.04 | 0.04 | UNCLASS. H.C. C- 9 |

108_141022_007 VC-Run 1973 distillate batch 3.txt

| | | | | |
|---|---|---|---|---|
| 191 | 0.02 | 0.04 | 0.05 | UNCLASS. H.C. C-11 |
| 4104 | 0.01 | 0.01 | 0.02 | UNCLASSIFIED C-12 E |

108_141103_001 Run 1975 VC #5.txt
CHEVRON RESEARCH GASOLINE ANALYSIS
ASTM DHAX METHOD

Sample ID: Run 1975 VC #5
Acquisition Date & Time: 11/3/2014 10:25:01 AM
Channel: C108 (Offline)
Analysis: 108_141103_001.dat

*** DETAILED COMPOSITION, PERCENT ***

| C NO. | PARA | OLEF | NAPH | AROM | UNCL HC | TOTALS BY C # | NORMAL PARA | NON-ALKYL I-PARA | ALKYL I-PARA | CYCLO-PENT | CYCLO-HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| => BY WEIGHT | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 9.72 | **** | **** | **** | 2.72 | 12.44 | 0.34 | 9.37 | **** | **** | **** |
| 5 | 65.51 | **** | 4.65 | **** | **** | 70.16 | 0.19 | 65.32 | **** | 4.65 | **** |
| 6 | 3.46 | **** | 0.21 | **** | **** | 3.66 | 0.56 | 2.90 | **** | 0.17 | 0.04 |
| 7 | 0.91 | **** | 0.01 | **** | **** | 0.92 | **** | 0.91 | **** | **** | 0.01 |
| 8 | 12.38 | **** | 0.08 | **** | 0.02 | 12.47 | **** | 0.49 | 11.89 | 0.01 | 0.07 |
| 9 | 0.09 | **** | 0.05 | 0.14 | 0.05 | 0.33 | 0.02 | 0.07 | **** | 0.02 | 0.03 |
| 10 | 0.01 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 92.06 | **** | 5.00 | 0.14 | 2.80 | 100.00 | 1.11 | 79.07 | 11.89 | 4.84 | 0.15 |
| => BY VOLUME | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 11.00 | **** | **** | **** | 2.20 | 13.20 | 0.37 | 10.63 | **** | **** | **** |
| 5 | 66.95 | **** | 3.96 | **** | **** | 70.90 | 0.19 | 66.76 | **** | 3.96 | **** |
| 6 | 3.36 | **** | 0.17 | **** | **** | 3.53 | 0.54 | 2.82 | **** | 0.14 | 0.03 |
| 7 | 0.84 | **** | 0.01 | **** | **** | 0.85 | **** | 0.84 | **** | **** | 0.01 |
| 8 | 11.16 | **** | 0.07 | **** | 0.02 | 11.24 | **** | 0.45 | 10.71 | 0.00 | 0.06 |
| 9 | 0.08 | **** | 0.04 | 0.10 | 0.04 | 0.27 | 0.02 | 0.07 | **** | 0.02 | 0.03 |
| 10 | 0.01 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.00 | 0.00 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 93.39 | **** | 4.25 | 0.10 | 2.26 | 100.00 | 1.12 | 81.56 | 10.71 | 4.12 | 0.13 |
| => BY MOLAR | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 12.36 | **** | **** | **** | 3.47 | 15.83 | 0.43 | 11.93 | **** | **** | **** |
| 5 | 67.15 | **** | 4.90 | **** | **** | 72.06 | 0.19 | 66.96 | **** | 4.90 | **** |
| 6 | 2.97 | **** | 0.18 | **** | **** | 3.15 | 0.48 | 2.49 | **** | 0.15 | 0.03 |
| 7 | 0.67 | **** | 0.01 | **** | **** | 0.68 | **** | 0.67 | **** | **** | 0.01 |
| 8 | 8.01 | **** | 0.05 | **** | 0.01 | 8.08 | **** | 0.32 | 7.70 | 0.00 | 0.05 |
| 9 | 0.05 | **** | 0.03 | 0.09 | 0.03 | 0.20 | 0.01 | 0.04 | **** | 0.01 | 0.02 |
| 10 | 0.00 | **** | **** | **** | **** | 0.00 | 0.00 | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.00 | 0.00 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 91.23 | **** | 5.18 | 0.09 | 3.51 | 100.00 | 1.12 | 82.41 | 7.70 | 5.07 | 0.11 |

GRP. TYPE, VOL %: P = 95.55, O = 0.00, N = 4.34, A = 0.10, Saturates = 99.90
DIENE CONTENT = 0 vol ppm AVG MW= 74.0 API GR.= 90.2 SP. GR.= 0.6384
OCTANE NUMBER: (from pure values) RON = 94.1 MON = 91.0
(from blending values) RON = 92.8 MON = 88.6
CARBON-HYDROGEN RATIO = 5.032 STOICH. AIR-FUEL RATIO = 15.26 lbs air/lbs fuel
BTU/lb = 19252 NET, 20739 GROSS; BTU/gal = 102559 NET, 110481 GROSS
REID VAPOR PRESSURE = 23.5 BROMINE NO. = 0.0

* DISTILLATION CURVES

108_141103_001 Run 1975 VC #5.txt

| VOL % | TBP | D86 |
|---|---|---|
| 0 | 11 | 83 |
| 5 | 11 | 83 |
| 10 | 11 | 83 |
| 15 | 82 | 83 |
| 20 | 82 | 83 |
| 25 | 82 | 83 |
| 30 | 82 | 83 |
| 35 | 82 | 83 |
| 40 | 82 | 83 |
| 45 | 82 | 83 |
| 50 | 82 | 83 |
| 55 | 82 | 83 |
| 60 | 82 | 83 |
| 65 | 82 | 83 |
| 70 | 82 | 83 |
| 75 | 82 | 83 |
| 80 | 121 | 121 |
| 85 | 156 | 181 |
| 90 | 211 | 210 |
| 95 | 211 | 238 |
| 100 | 365 | 238 |

* COMPOUND DICTIONARY NUMBERS AND AREAS AS READ IN

| CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 369538 | 4 | 13411 | 8 | 8886 | 7 | 2585797 | 6 | 7509 |
| 12 | 84175 | 800 | 189998 | 13 | 2858 | 10 | 15048 | 11 | 13638 |
| 9 | 22265 | 801 | 6972 | 18 | 1203 | 20 | 1789 | 1009 | 97292 |
| 825 | 1475 | 19 | 21625 | 15 | 6706 | 16 | 5086 | 37 | 301507 |
| 826 | 393 | 36 | 3789 | 31 | 10485 | 30 | 7623 | 39 | 5398 |
| 38 | 166228 | 34 | 599 | 24 | 553 | 831 | 1840 | 848 | 751 |
| 25 | 450 | 861 | 218 | 830 | 888 | 188 | 732 | 189 | 1113 |
| 829 | 320 | 52 | 1486 | 189 | 963 | 53 | 555 | 956 | 897 |
| 60 | 331 | 61 | 592 | 941 | 508 | 41 | 703 | 644 | 463 |
| 609 | 1663 | 610 | 798 | 613 | 737 | 608 | 468 | 612 | 1808 |
| 100 | 334 | 191 | 206 | | | | | | |

TOTAL UNCORRECTED AREA = 3970670
NUMBER OF PEAKS READ IN = 52

* DETAILED HYDROCARBON ANALYSIS, EXCLUDING COMPOUNDS BELOW 0.01 VOLUME PERCENT

NORMAL PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4 | 0.43 | 0.37 | 0.34 | N-BUTANE |
| 6 | 0.19 | 0.19 | 0.19 | N-PENTANE |
| 9 | 0.48 | 0.54 | 0.56 | N-HEXANE |
| 41 | 0.01 | 0.02 | 0.02 | N-NONANE |

108_141103_001 Run 1975 VC #5.txt

ISO-PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 5 | 11.93 | 10.63 | 9.37 | ISOBUTANE | |
| 8 | 0.23 | 0.24 | 0.22 | 22-DIME PROPANE | |
| 7 | 66.73 | 66.52 | 65.09 | ISOPENTANE | |
| 12 | 1.81 | 2.06 | 2.11 | 22-DIME BUTANE | |
| 13 | 0.06 | 0.07 | 0.07 | 23-DIME BUTANE | |
| 10 | 0.32 | 0.37 | 0.38 | 2-ME PENTANE | |
| 11 | 0.29 | 0.33 | 0.34 | 3-ME PENTANE | |
| 18 | 0.02 | 0.03 | 0.03 | 22-DIME PENTANE | |
| 20 | 0.03 | 0.04 | 0.04 | 24-DIME PENTANE | |
| 19 | 0.40 | 0.49 | 0.54 | 23-DIME PENTANE | |
| 15 | 0.12 | 0.16 | 0.17 | 2-ME HEXANE | |
| 16 | 0.09 | 0.12 | 0.13 | 3-ME HEXANE | |
| 37 | 4.87 | 6.89 | 7.51 | 224-TRIME PENTANE | * |
| 36 | 0.06 | 0.08 | 0.09 | 223-TRIME PENTANE | * |
| 31 | 0.17 | 0.24 | 0.26 | 25-DIME HEXANE | |
| 30 | 0.12 | 0.17 | 0.19 | 24-DIME HEXANE | |
| 39 | 0.09 | 0.12 | 0.13 | 234-TRIME PENTANE | * |
| 38 | 2.68 | 3.62 | 4.14 | 233-TRIME PENTANE | * |
| 34 | 0.01 | 0.01 | 0.01 | 2-ME-3-ET PENTANE | |
| 24 | 0.01 | 0.01 | 0.01 | 2-ME HEPTANE | |
| 25 | 0.01 | 0.01 | 0.01 | 3-ME HEPTANE | |
| 52 | 0.02 | 0.03 | 0.04 | 24-DIME HEPTANE | |
| 53 | 0.01 | 0.01 | 0.01 | 26-DIME HEPTANE | |
| 61 | 0.01 | 0.01 | 0.01 | 3-ME OCTANE | |

CYCLOPENTANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 800 | 4.90 | 3.96 | 4.65 | CYCLOPENTANE |
| 801 | 0.15 | 0.14 | 0.17 | ME CYCLOPENTANE |
| 848 | 0.01 | 0.02 | 0.02 | 113T4-TETRME CPENT |

CYCLOHEXANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 825 | 0.03 | 0.03 | 0.04 | CYCLOHEXANE |
| 831 | 0.03 | 0.04 | 0.05 | 1C3-DIME CYCHEXANE |
| 830 | 0.01 | 0.02 | 0.02 | 1T2-DIME CYCHEXANE |
| 956 | 0.01 | 0.02 | 0.02 | 1C3T5-TRIME CYCHEX |
| 941 | 0.01 | 0.01 | 0.01 | 1ME-C3ET CYCHEXANE |

AROMATIC HCS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 609 | 0.02 | 0.03 | 0.04 | 1-ME-3-ET BENZENE | |
| 610 | 0.01 | 0.01 | 0.02 | 1-ME-4-ET BENZENE | |
| 613 | 0.01 | 0.01 | 0.02 | 135-TRIME BENZENE | |
| 612 | 0.03 | 0.03 | 0.04 | 124-TRIME BENZENE | * |

UNCLASSIFIED HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 1009 | 3.47 | 2.20 | 2.72 | ISOBUTANOL |
| 188 | 0.01 | 0.02 | 0.02 | UNCLASS. H.C. C- 8 |

108_141103_001 Run 1975 VC #5.txt

| | | | | |
|---|---|---|---|---|
| 189 | 0.02 | 0.02 | 0.03 | UNCLASS. H.C. C- 9 |
| 189 | 0.01 | 0.02 | 0.02 | UNCLASS. H.C. C- 9 |

SE-30 VC Run 1976 distillate batch 6.txt
CHEVRON RESEARCH GASOLINE ANALYSIS
ASTM DHAX METHOD

Sample ID: Run 1976 vapor condensate overheads
Acquisition Date & Time: 11/10/2014 10:00:04 AM
Channel: C108 (Offline)
Analysis: 108_141110_002.dat

*** DETAILED COMPOSITION, PERCENT ***

| C NO. | PARA | OLEF | NAPH | AROM | UNCL HC | TOTALS BY C # | NORMAL PARA | NON-ALKYL I-PARA | ALKYL I-PARA | CYCLO-PENT | CYCLO-HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| => BY WEIGHT | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 7.03 | **** | **** | **** | 2.74 | 9.77 | 0.27 | 6.76 | **** | **** | **** |
| 5 | 67.31 | **** | 5.10 | **** | **** | 72.41 | 0.20 | 67.10 | **** | 5.10 | **** |
| 6 | 3.82 | **** | 0.22 | **** | **** | 4.05 | 0.62 | 3.20 | **** | 0.19 | 0.04 |
| 7 | 0.96 | **** | 0.01 | **** | **** | 0.98 | **** | 0.96 | **** | **** | 0.01 |
| 8 | 12.42 | **** | 0.07 | **** | 0.01 | 12.51 | **** | 0.47 | 11.95 | **** | 0.07 |
| 9 | 0.08 | **** | 0.05 | 0.10 | 0.04 | 0.28 | 0.01 | 0.07 | **** | 0.02 | 0.03 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 91.63 | **** | 5.46 | 0.10 | 2.81 | 100.00 | 1.11 | 78.57 | 11.95 | 5.31 | 0.15 |
| => BY VOLUME | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 7.99 | **** | **** | **** | 2.22 | 10.21 | 0.30 | 7.70 | **** | **** | **** |
| 5 | 69.06 | **** | 4.36 | **** | **** | 73.41 | 0.21 | 68.85 | **** | 4.36 | **** |
| 6 | 3.72 | **** | 0.19 | **** | **** | 3.91 | 0.60 | 3.12 | **** | 0.16 | 0.03 |
| 7 | 0.89 | **** | 0.01 | **** | **** | 0.90 | **** | 0.89 | **** | **** | 0.01 |
| 8 | 11.25 | **** | 0.06 | **** | 0.01 | 11.32 | **** | 0.43 | 10.82 | **** | 0.06 |
| 9 | 0.07 | **** | 0.04 | 0.08 | 0.04 | 0.23 | 0.01 | 0.06 | **** | 0.02 | 0.03 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 92.99 | **** | 4.65 | 0.08 | 2.28 | 100.00 | 1.11 | 81.06 | 10.82 | 4.53 | 0.12 |
| => BY MOLAR | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 9.02 | **** | **** | **** | 3.51 | 12.53 | 0.35 | 8.67 | **** | **** | **** |
| 5 | 69.50 | **** | 5.42 | **** | **** | 74.91 | 0.21 | 69.29 | **** | 5.42 | **** |
| 6 | 3.30 | **** | 0.20 | **** | **** | 3.50 | 0.54 | 2.77 | **** | 0.17 | 0.03 |
| 7 | 0.72 | **** | 0.01 | **** | **** | 0.73 | **** | 0.72 | **** | **** | 0.01 |
| 8 | 8.10 | **** | 0.04 | **** | 0.01 | 8.16 | **** | 0.31 | 7.80 | **** | 0.04 |
| 9 | 0.05 | **** | 0.03 | 0.07 | 0.02 | 0.17 | 0.01 | 0.04 | **** | 0.01 | 0.02 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.00 | 0.00 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 90.68 | **** | 5.70 | 0.07 | 3.55 | 100.00 | 1.10 | 81.79 | 7.80 | 5.60 | 0.10 |

GRP. TYPE, VOL %: P = 95.16, O = 0.00, N = 4.76, A = 0.08, Saturates = 99.92
DIENE CONTENT = 0 vol ppm AVG MW= 74.5 API GR.= 89.3 SP. GR.= 0.6409
OCTANE NUMBER: (from pure values) RON = 93.8 MON = 90.8
(from blending values) RON = 92.4 MON = 88.3
CARBON-HYDROGEN RATIO = 5.042 STOICH. AIR-FUEL RATIO = 15.25 lbs air/lbs fuel
BTU/lb = 19251 NET, 20735 GROSS; BTU/gal = 102958 NET, 110897 GROSS
REID VAPOR PRESSURE = 21.7 BROMINE NO. = 0.0

* DISTILLATION CURVES

SE-30 VC Run 1976 distillate batch 6.txt

| VOL % | TBP | D86 |
|---|---|---|
| 0 | 11 | 83 |
| 5 | 11 | 83 |
| 10 | 82 | 83 |
| 15 | 82 | 83 |
| 20 | 82 | 83 |
| 25 | 82 | 83 |
| 30 | 82 | 83 |
| 35 | 82 | 83 |
| 40 | 82 | 83 |
| 45 | 82 | 83 |
| 50 | 82 | 83 |
| 55 | 82 | 83 |
| 60 | 82 | 83 |
| 65 | 82 | 83 |
| 70 | 82 | 83 |
| 75 | 82 | 83 |
| 80 | 121 | 121 |
| 85 | 156 | 181 |
| 90 | 211 | 210 |
| 95 | 211 | 236 |
| 100 | 365 | 238 |

* COMPOUND DICTIONARY NUMBERS AND AREAS AS READ IN

| CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 202431 | 4 | 8093 | 8 | 5875 | 7 | 2018075 | 6 | 6109 |
| 12 | 70674 | 800 | 158259 | 13 | 2365 | 10 | 12660 | 11 | 11270 |
| 9 | 18822 | 801 | 5800 | 18 | 1070 | 20 | 1480 | 1009 | 74282 |
| 825 | 1152 | 19 | 17192 | 15 | 5442 | 16 | 4139 | 37 | 233511 |
| 826 | 341 | 36 | 2847 | 31 | 7693 | 30 | 5681 | 39 | 4014 |
| 38 | 123819 | 34 | 551 | 24 | 385 | 831 | 1394 | 848 | 634 |
| 830 | 699 | 188 | 462 | 189 | 818 | 52 | 962 | 189 | 487 |
| 54 | 890 | 956 | 631 | 61 | 223 | 941 | 368 | 41 | 431 |
| 644 | 229 | 609 | 890 | 610 | 536 | 613 | 378 | 608 | 306 |
| 612 | 1083 | 191 | 313 | | | | | | |

TOTAL UNCORRECTED AREA = 3015766
NUMBER OF PEAKS READ IN = 47

* DETAILED HYDROCARBON ANALYSIS, EXCLUDING COMPOUNDS BELOW 0.01 VOLUME PERCENT

NORMAL PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4 | 0.35 | 0.30 | 0.27 | N-BUTANE |
| 6 | 0.21 | 0.21 | 0.20 | N-PENTANE |
| 9 | 0.54 | 0.60 | 0.62 | N-HEXANE |
| 41 | 0.01 | 0.01 | 0.01 | N-NONANE |

SE-30 VC Run 1976 distillate batch 6.txt

ISO-PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 5 | 8.67 | 7.70 | 6.76 | ISOBUTANE | |
| 8 | 0.20 | 0.21 | 0.19 | 22-DIME PROPANE | |
| 7 | 69.09 | 68.64 | 66.91 | ISOPENTANE | |
| 12 | 2.02 | 2.29 | 2.33 | 22-DIME BUTANE | |
| 13 | 0.07 | 0.08 | 0.08 | 23-DIME BUTANE | |
| 10 | 0.36 | 0.41 | 0.42 | 2-ME PENTANE | |
| 11 | 0.32 | 0.36 | 0.37 | 3-ME PENTANE | |
| 18 | 0.03 | 0.03 | 0.04 | 22-DIME PENTANE | |
| 20 | 0.04 | 0.05 | 0.05 | 24-DIME PENTANE | |
| 19 | 0.42 | 0.52 | 0.57 | 23-DIME PENTANE | |
| 15 | 0.13 | 0.17 | 0.18 | 2-ME HEXANE | |
| 16 | 0.10 | 0.13 | 0.14 | 3-ME HEXANE | |
| 37 | 5.00 | 7.06 | 7.66 | 224-TRIME PENTANE | * |
| 36 | 0.06 | 0.08 | 0.09 | 223-TRIME PENTANE | * |
| 31 | 0.16 | 0.23 | 0.25 | 25-DIME HEXANE | |
| 30 | 0.12 | 0.17 | 0.19 | 24-DIME HEXANE | |
| 39 | 0.09 | 0.12 | 0.13 | 234-TRIME PENTANE | * |
| 38 | 2.65 | 3.57 | 4.06 | 233-TRIME PENTANE | * |
| 34 | 0.01 | 0.02 | 0.02 | 2-ME-3-ET PENTANE | |
| 24 | 0.01 | 0.01 | 0.01 | 2-ME HEPTANE | |
| 52 | 0.02 | 0.03 | 0.03 | 24-DIME HEPTANE | |
| 54 | 0.02 | 0.03 | 0.03 | 25-DIME HEPTANE | |

CYCLOPENTANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 800 | 5.42 | 4.36 | 5.10 | CYCLOPENTANE |
| 801 | 0.17 | 0.16 | 0.19 | ME CYCLOPENTANE |
| 848 | 0.01 | 0.02 | 0.02 | 113T4-TETRME CPENT |

CYCLOHEXANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 825 | 0.03 | 0.03 | 0.04 | CYCLOHEXANE |
| 831 | 0.03 | 0.04 | 0.04 | 1C3-DIME CYCHEXANE |
| 830 | 0.01 | 0.02 | 0.02 | 1T2-DIME CYCHEXANE |
| 956 | 0.01 | 0.02 | 0.02 | 1C3T5-TRIME CYCHEX |

AROMATIC HCS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 609 | 0.02 | 0.02 | 0.03 | 1-ME-3-ET BENZENE | |
| 610 | 0.01 | 0.01 | 0.02 | 1-ME-4-ET BENZENE | |
| 612 | 0.02 | 0.02 | 0.03 | 124-TRIME BENZENE | * |

UNCLASSIFIED HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 1009 | 3.51 | 2.22 | 2.74 | ISOBUTANOL |
| 188 | 0.01 | 0.01 | 0.01 | UNCLASS. H.C. C- 8 |
| 189 | 0.02 | 0.02 | 0.03 | UNCLASS. H.C. C- 9 |
| 189 | 0.01 | 0.01 | 0.02 | UNCLASS. H.C. C- 9 |

SE-30 VC- Run 1986 distillate batch 7.txt
CHEVRON RESEARCH GASOLINE ANALYSIS
ASTM DHAX METHOD

Sample ID: Run 1986 vapor condensate
Acquisition Date & Time: 11/18/2014 11:10:01 AM
Channel: C108 (Offline)
Analysis: 108_141118_002.dat

*** DETAILED COMPOSITION, PERCENT ***

| C NO. | PARA | OLEF | NAPH | AROM | UNCL HC | TOTALS BY C # | NORMAL PARA | NON-ALKYL I-PARA | ALKYL I-PARA | CYCLO-PENT | CYCLO-HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| => BY WEIGHT | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 6.40 | **** | **** | **** | 3.81 | 10.21 | 0.26 | 6.14 | **** | **** | **** |
| 5 | 63.18 | **** | 5.13 | **** | **** | 68.32 | 0.19 | 62.99 | **** | 5.13 | **** |
| 6 | 3.92 | **** | 0.25 | **** | **** | 4.17 | 0.68 | 3.24 | **** | 0.21 | 0.04 |
| 7 | 1.17 | **** | 0.05 | **** | **** | 1.22 | 0.02 | 1.14 | **** | 0.01 | 0.04 |
| 8 | 15.54 | **** | 0.11 | **** | 0.03 | 15.67 | **** | 0.67 | 14.87 | 0.01 | 0.10 |
| 9 | 0.12 | **** | 0.07 | 0.15 | 0.06 | 0.40 | 0.03 | 0.10 | **** | 0.03 | 0.04 |
| 10 | 0.02 | **** | **** | **** | **** | 0.02 | 0.02 | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 90.35 | **** | 5.60 | 0.15 | 3.90 | 100.00 | 1.19 | 74.29 | 14.87 | 5.38 | 0.23 |
| => BY VOLUME | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 7.33 | **** | **** | **** | 3.11 | 10.44 | 0.29 | 7.04 | **** | **** | **** |
| 5 | 65.32 | **** | 4.42 | **** | **** | 69.74 | 0.19 | 65.13 | **** | 4.42 | **** |
| 6 | 3.85 | **** | 0.21 | **** | **** | 4.06 | 0.66 | 3.19 | **** | 0.18 | 0.04 |
| 7 | 1.09 | **** | 0.04 | **** | **** | 1.13 | 0.02 | 1.07 | **** | 0.01 | 0.03 |
| 8 | 14.18 | **** | 0.09 | **** | 0.02 | 14.29 | **** | 0.62 | 13.56 | 0.01 | 0.08 |
| 9 | 0.11 | **** | 0.06 | 0.11 | 0.05 | 0.33 | 0.02 | 0.09 | **** | 0.02 | 0.03 |
| 10 | 0.01 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 91.89 | **** | 4.81 | 0.11 | 3.19 | 100.00 | 1.20 | 77.13 | 13.56 | 4.63 | 0.19 |
| => BY MOLAR | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 8.31 | **** | **** | **** | 4.95 | 13.26 | 0.34 | 7.97 | **** | **** | **** |
| 5 | 66.05 | **** | 5.52 | **** | **** | 71.57 | 0.20 | 65.86 | **** | 5.52 | **** |
| 6 | 3.43 | **** | 0.23 | **** | **** | 3.65 | 0.59 | 2.84 | **** | 0.19 | 0.04 |
| 7 | 0.88 | **** | 0.04 | **** | **** | 0.92 | 0.02 | 0.86 | **** | 0.01 | 0.03 |
| 8 | 10.26 | **** | 0.07 | **** | 0.02 | 10.35 | **** | 0.44 | 9.82 | 0.01 | 0.07 |
| 9 | 0.07 | **** | 0.04 | 0.09 | 0.03 | 0.24 | 0.02 | 0.06 | **** | 0.02 | 0.03 |
| 10 | 0.01 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 89.01 | **** | 5.89 | 0.09 | 5.00 | 100.00 | 1.17 | 78.02 | 9.82 | 5.73 | 0.16 |

GRP. TYPE, VOL %: P = 94.91, O = 0.00, N = 4.97, A = 0.11, Saturates = 99.89
DIENE CONTENT = 0 vol ppm AVG MW= 75.4 API GR.= 87.6 SP. GR.= 0.6458
OCTANE NUMBER: (from pure values) RON = 94.0 MON = 90.8
(from blending values) RON = 92.5 MON = 88.3
CARBON-HYDROGEN RATIO = 5.054 STOICH. AIR-FUEL RATIO = 15.24 lbs air/lbs fuel
BTU/lb = 19228 NET, 20688 GROSS; BTU/gal = 103622 NET, 111492 GROSS
REID VAPOR PRESSURE = 20.5 BROMINE NO. = 0.0

* DISTILLATION CURVES

SE-30 VC- Run 1986 distillate batch 7.txt

| VOL % | TBP | D86 |
|---|---|---|
| 0 | 11 | 83 |
| 5 | 11 | 83 |
| 10 | 82 | 83 |
| 15 | 82 | 83 |
| 20 | 82 | 83 |
| 25 | 82 | 83 |
| 30 | 82 | 83 |
| 35 | 82 | 83 |
| 40 | 82 | 83 |
| 45 | 82 | 83 |
| 50 | 82 | 83 |
| 55 | 82 | 83 |
| 60 | 82 | 83 |
| 65 | 82 | 83 |
| 70 | 82 | 83 |
| 75 | 121 | 121 |
| 80 | 146 | 162 |
| 85 | 194 | 210 |
| 90 | 211 | 210 |
| 95 | 239 | 238 |
| 100 | 345 | 243 |

* COMPOUND DICTIONARY NUMBERS AND AREAS AS READ IN

| CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 209833 | 4 | 8839 | 8 | 6237 | 7 | 2162637 | 6 | 6536 |
| 12 | 80113 | 800 | 181776 | 13 | 2893 | 10 | 15310 | 11 | 13747 |
| 9 | 23386 | 801 | 7324 | 18 | 1363 | 20 | 1866 | 1009 | 118051 |
| 825 | 1578 | 19 | 23443 | 15 | 7338 | 16 | 5707 | 806 | 245 |
| 37 | 326824 | 14 | 788 | 826 | 1446 | 36 | 4186 | 31 | 11462 |
| 30 | 8430 | 39 | 5805 | 38 | 180420 | 34 | 823 | 24 | 1206 |
| 26 | 471 | 831 | 1996 | 848 | 897 | 25 | 950 | 861 | 264 |
| 830 | 1071 | 188 | 894 | 189 | 1500 | 829 | 404 | 52 | 1522 |
| 189 | 539 | 53 | 451 | 956 | 932 | 60 | 720 | 61 | 684 |
| 941 | 551 | 41 | 928 | 644 | 423 | 609 | 1465 | 610 | 770 |
| 613 | 740 | 608 | 398 | 612 | 1726 | 100 | 534 | | |

TOTAL UNCORRECTED AREA = 3440442
NUMBER OF PEAKS READ IN = 54

* DETAILED HYDROCARBON ANALYSIS, EXCLUDING COMPOUNDS BELOW 0.01 VOLUME PERCENT

NORMAL PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4 | 0.34 | 0.29 | 0.26 | N-BUTANE |
| 6 | 0.20 | 0.19 | 0.19 | N-PENTANE |
| 9 | 0.59 | 0.66 | 0.68 | N-HEXANE |
| 14 | 0.02 | 0.02 | 0.02 | N-HEPTANE |

SE-30 VC- Run 1986 distillate batch 7.txt

| | | | | |
|---|---|---|---|---|
| 41 | 0.02 | 0.02 | 0.03 | N-NONANE |
| 100 | 0.01 | 0.01 | 0.02 | N-DECANE |

ISO-PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 5 | 7.97 | 7.04 | 6.14 | ISOBUTANE | |
| 8 | 0.19 | 0.20 | 0.18 | 22-DIME PROPANE | |
| 7 | 65.67 | 64.93 | 62.81 | ISOPENTANE | |
| 12 | 2.03 | 2.29 | 2.32 | 22-DIME BUTANE | |
| 13 | 0.07 | 0.08 | 0.08 | 23-DIME BUTANE | |
| 10 | 0.39 | 0.43 | 0.44 | 2-ME PENTANE | |
| 11 | 0.35 | 0.38 | 0.40 | 3-ME PENTANE | |
| 18 | 0.03 | 0.04 | 0.04 | 22-DIME PENTANE | |
| 20 | 0.04 | 0.05 | 0.05 | 24-DIME PENTANE | |
| 19 | 0.51 | 0.62 | 0.68 | 23-DIME PENTANE | |
| 15 | 0.16 | 0.20 | 0.21 | 2-ME HEXANE | |
| 16 | 0.12 | 0.15 | 0.16 | 3-ME HEXANE | |
| 37 | 6.21 | 8.72 | 9.40 | 224-TRIME PENTANE | * |
| 36 | 0.08 | 0.11 | 0.12 | 223-TRIME PENTANE | * |
| 31 | 0.22 | 0.30 | 0.33 | 25-DIME HEXANE | |
| 30 | 0.16 | 0.22 | 0.24 | 24-DIME HEXANE | |
| 39 | 0.11 | 0.15 | 0.17 | 234-TRIME PENTANE | * |
| 38 | 3.43 | 4.59 | 5.19 | 233-TRIME PENTANE | * |
| 34 | 0.02 | 0.02 | 0.02 | 2-ME-3-ET PENTANE | |
| 24 | 0.02 | 0.03 | 0.03 | 2-ME HEPTANE | |
| 26 | 0.01 | 0.01 | 0.01 | 4-ME HEPTANE | |
| 25 | 0.02 | 0.02 | 0.03 | 3-ME HEPTANE | |
| 52 | 0.03 | 0.04 | 0.04 | 24-DIME HEPTANE | |
| 53 | 0.01 | 0.01 | 0.01 | 26-DIME HEPTANE | |
| 60 | 0.01 | 0.02 | 0.02 | 2-ME OCTANE | |
| 61 | 0.01 | 0.02 | 0.02 | 3-ME OCTANE | |

CYCLOPENTANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 800 | 5.52 | 4.42 | 5.13 | CYCLOPENTANE |
| 801 | 0.19 | 0.18 | 0.21 | ME CYCLOPENTANE |
| 848 | 0.02 | 0.02 | 0.03 | 113T4-TETRME CPENT |

CYCLOHEXANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 825 | 0.04 | 0.04 | 0.04 | CYCLOHEXANE |
| 826 | 0.03 | 0.03 | 0.04 | ME CYCLOHEXANE |
| 831 | 0.04 | 0.05 | 0.06 | 1C3-DIME CYCHEXANE |
| 830 | 0.02 | 0.03 | 0.03 | 1T2-DIME CYCHEXANE |
| 956 | 0.02 | 0.02 | 0.03 | 1C3T5-TRIME CYCHEX |
| 941 | 0.01 | 0.01 | 0.02 | 1ME-C3ET CYCHEXANE |

AROMATIC HCS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 609 | 0.02 | 0.03 | 0.04 | 1-ME-3-ET BENZENE | |
| 610 | 0.01 | 0.02 | 0.02 | 1-ME-4-ET BENZENE | |
| 613 | 0.01 | 0.01 | 0.02 | 135-TRIME BENZENE | |
| 612 | 0.03 | 0.03 | 0.05 | 124-TRIME BENZENE | * |

SE-30 VC- Run 1986 distillate batch 7.txt

UNCLASSIFIED HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 1009 | 4.95 | 3.11 | 3.81 | ISOBUTANOL |
| 188 | 0.02 | 0.02 | 0.03 | UNCLASS. H.C. C- 8 |
| 189 | 0.03 | 0.04 | 0.04 | UNCLASS. H.C. C- 9 |
| 189 | 0.01 | 0.01 | 0.02 | UNCLASS. H.C. C- 9 |

SE-30 VC- Batch 9 Run 2022 distillate.txt
CHEVRON RESEARCH GASOLINE ANALYSIS
ASTM DHAX METHOD

Sample ID: VC Run 2022 Batch 9 distillate
Acquisition Date & Time: 1/26/2015 12:07:23 PM
Channel: C108 (Offline)
Analysis: 108_150126_003.dat

*** DETAILED COMPOSITION, PERCENT ***

| C NO. | PARA | OLEF | NAPH | AROM | UNCL HC | TOTALS BY C # | NORMAL PARA | NON-ALKYL I-PARA | ALKYL I-PARA | CYCLO-PENT | CYCLO-HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| => BY WEIGHT | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 9.80 | **** | **** | **** | 2.51 | 12.30 | 0.33 | 9.47 | **** | **** | **** |
| 5 | 66.27 | **** | 4.89 | **** | **** | 71.16 | 0.19 | 66.08 | **** | 4.89 | **** |
| 6 | 3.63 | **** | 0.21 | **** | **** | 3.84 | 0.56 | 3.07 | **** | 0.17 | 0.04 |
| 7 | 0.86 | **** | 0.01 | **** | **** | 0.87 | **** | 0.86 | **** | **** | 0.01 |
| 8 | 11.43 | **** | 0.10 | **** | 0.02 | 11.55 | **** | 0.45 | 10.98 | **** | 0.10 |
| 9 | 0.06 | **** | 0.05 | 0.12 | 0.04 | 0.26 | 0.02 | 0.04 | **** | 0.02 | 0.03 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.02 | 0.02 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 92.04 | **** | 5.26 | 0.12 | 2.58 | 100.00 | 1.11 | 79.96 | 10.98 | 5.08 | 0.18 |
| => BY VOLUME | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 11.08 | **** | **** | **** | 2.02 | 13.10 | 0.36 | 10.72 | **** | **** | **** |
| 5 | 67.64 | **** | 4.15 | **** | **** | 71.79 | 0.20 | 67.44 | **** | 4.15 | **** |
| 6 | 3.52 | **** | 0.18 | **** | **** | 3.69 | 0.54 | 2.98 | **** | 0.15 | 0.03 |
| 7 | 0.79 | **** | 0.01 | **** | **** | 0.80 | **** | 0.79 | **** | **** | 0.01 |
| 8 | 10.29 | **** | 0.08 | **** | 0.02 | 10.39 | **** | 0.41 | 9.89 | **** | 0.08 |
| 9 | 0.05 | **** | 0.04 | 0.08 | 0.03 | 0.21 | 0.02 | 0.04 | **** | 0.02 | 0.02 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.02 | 0.02 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 93.37 | **** | 4.46 | 0.08 | 2.08 | 100.00 | 1.11 | 82.37 | 9.89 | 4.32 | 0.14 |
| => BY MOLAR | | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 12.42 | **** | **** | **** | 3.18 | 15.61 | 0.42 | 12.01 | **** | **** | **** |
| 5 | 67.71 | **** | 5.14 | **** | **** | 72.85 | 0.20 | 67.51 | **** | 5.14 | **** |
| 6 | 3.10 | **** | 0.18 | **** | **** | 3.29 | 0.48 | 2.62 | **** | 0.15 | 0.03 |
| 7 | 0.63 | **** | 0.01 | **** | **** | 0.64 | **** | 0.63 | **** | **** | 0.01 |
| 8 | 7.38 | **** | 0.06 | **** | 0.01 | 7.45 | **** | 0.29 | 7.09 | **** | 0.06 |
| 9 | 0.04 | **** | 0.03 | 0.07 | 0.02 | 0.16 | 0.01 | 0.02 | **** | 0.01 | 0.02 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | 0.01 | 0.01 | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 91.28 | **** | 5.42 | 0.07 | 3.22 | 100.00 | 1.11 | 83.08 | 7.09 | 5.30 | 0.12 |

GRP. TYPE, VOL %: P = 95.36, O = 0.00, N = 4.55, A = 0.09, Saturates = 99.91
DIENE CONTENT = 0 vol ppm AVG MW= 73.7 API GR.= 90.5 SP. GR.= 0.6375
OCTANE NUMBER: (from pure values) RON = 94.0 MON = 91.0
(from blending values) RON = 92.7 MON = 88.5
CARBON-HYDROGEN RATIO = 5.031 STOICH. AIR-FUEL RATIO = 15.26 lbs air/lbs fuel
BTU/lb = 19258 NET, 20752 GROSS; BTU/gal = 102455 NET, 110403 GROSS
REID VAPOR PRESSURE = 23.7 BROMINE NO. = 0.0

* DISTILLATION CURVES

SE-30 VC- Batch 9 Run 2022 distillate.txt

| VOL % | TBP | D86 |
|---|---|---|
| 0 | 11 | 83 |
| 5 | 11 | 83 |
| 10 | 11 | 83 |
| 15 | 82 | 83 |
| 20 | 82 | 83 |
| 25 | 82 | 83 |
| 30 | 82 | 83 |
| 35 | 82 | 83 |
| 40 | 82 | 83 |
| 45 | 82 | 83 |
| 50 | 82 | 83 |
| 55 | 82 | 83 |
| 60 | 82 | 83 |
| 65 | 82 | 83 |
| 70 | 82 | 83 |
| 75 | 82 | 83 |
| 80 | 121 | 121 |
| 85 | 122 | 156 |
| 90 | 211 | 210 |
| 95 | 211 | 228 |
| 100 | 365 | 238 |

* COMPOUND DICTIONARY NUMBERS AND AREAS AS READ IN

| CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 254937 | 4 | 8913 | 8 | 5864 | 7 | 1787652 | 6 | 5247 |
| 12 | 60750 | 800 | 136495 | 13 | 2102 | 10 | 10893 | 11 | 9821 |
| 9 | 15358 | 801 | 4836 | 18 | 856 | 20 | 1191 | 1009 | 61201 |
| 825 | 996 | 19 | 13802 | 15 | 4278 | 16 | 3342 | 37 | 191556 |
| 826 | 387 | 36 | 2403 | 31 | 6567 | 30 | 4931 | 39 | 3379 |
| 38 | 103735 | 34 | 439 | 24 | 381 | 831 | 1224 | 848 | 524 |
| 830 | 591 | 188 | 496 | 189 | 707 | 827 | 924 | 189 | 325 |
| 54 | 987 | 956 | 519 | 61 | 202 | 941 | 297 | 41 | 498 |
| 644 | 277 | 609 | 842 | 610 | 465 | 613 | 400 | 608 | 300 |
| 612 | 1127 | 191 | 525 | | | | | | |

TOTAL UNCORRECTED AREA = 2713542
NUMBER OF PEAKS READ IN = 47

* DETAILED HYDROCARBON ANALYSIS, EXCLUDING COMPOUNDS BELOW 0.01 VOLUME PERCENT

NORMAL PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4 | 0.42 | 0.36 | 0.33 | N-BUTANE |
| 6 | 0.20 | 0.20 | 0.19 | N-PENTANE |
| 9 | 0.48 | 0.54 | 0.56 | N-HEXANE |
| 41 | 0.01 | 0.02 | 0.02 | N-NONANE |

SE-30 VC- Batch 9 Run 2022 distillate.txt

ISO-PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 5 | 12.01 | 10.72 | 9.47 | ISOBUTANE | |
| 8 | 0.22 | 0.23 | 0.22 | 22-DIME PROPANE | |
| 7 | 67.29 | 67.21 | 65.86 | ISOPENTANE | |
| 12 | 1.91 | 2.17 | 2.23 | 22-DIME BUTANE | |
| 13 | 0.07 | 0.07 | 0.08 | 23-DIME BUTANE | |
| 10 | 0.34 | 0.39 | 0.40 | 2-ME PENTANE | |
| 11 | 0.31 | 0.34 | 0.36 | 3-ME PENTANE | |
| 18 | 0.02 | 0.03 | 0.03 | 22-DIME PENTANE | |
| 20 | 0.03 | 0.04 | 0.04 | 24-DIME PENTANE | |
| 19 | 0.37 | 0.46 | 0.50 | 23-DIME PENTANE | |
| 15 | 0.12 | 0.15 | 0.16 | 2-ME HEXANE | |
| 16 | 0.09 | 0.11 | 0.12 | 3-ME HEXANE | |
| 37 | 4.51 | 6.40 | 6.99 | 224-TRIME PENTANE | * |
| 36 | 0.06 | 0.08 | 0.09 | 223-TRIME PENTANE | * |
| 31 | 0.15 | 0.22 | 0.24 | 25-DIME HEXANE | |
| 30 | 0.12 | 0.16 | 0.18 | 24-DIME HEXANE | |
| 39 | 0.08 | 0.11 | 0.12 | 234-TRIME PENTANE | * |
| 38 | 2.44 | 3.30 | 3.78 | 233-TRIME PENTANE | * |
| 34 | 0.01 | 0.01 | 0.02 | 2-ME-3-ET PENTANE | |
| 24 | 0.01 | 0.01 | 0.01 | 2-ME HEPTANE | |
| 54 | 0.02 | 0.03 | 0.04 | 25-DIME HEPTANE | |

CYCLOPENTANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 800 | 5.14 | 4.15 | 4.89 | CYCLOPENTANE |
| 801 | 0.15 | 0.15 | 0.17 | ME CYCLOPENTANE |
| 848 | 0.01 | 0.02 | 0.02 | 113T4-TETRME CPENT |

CYCLOHEXANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 825 | 0.03 | 0.03 | 0.04 | CYCLOHEXANE |
| 826 | 0.01 | 0.01 | 0.01 | ME CYCLOHEXANE |
| 831 | 0.03 | 0.04 | 0.04 | 1C3-DIME CYCHEXANE |
| 830 | 0.01 | 0.02 | 0.02 | 1T2-DIME CYCHEXANE |
| 827 | 0.02 | 0.03 | 0.03 | ETHYL CYCLOHEXANE |
| 956 | 0.01 | 0.02 | 0.02 | 1C3T5-TRIME CYCHEX |

AROMATIC HCS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 609 | 0.02 | 0.02 | 0.03 | 1-ME-3-ET BENZENE | |
| 610 | 0.01 | 0.01 | 0.02 | 1-ME-4-ET BENZENE | |
| 612 | 0.02 | 0.03 | 0.04 | 124-TRIME BENZENE | * |

UNCLASSIFIED HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 1009 | 3.18 | 2.02 | 2.51 | ISOBUTANOL |
| 188 | 0.01 | 0.02 | 0.02 | UNCLASS. H.C. C- 8 |
| 189 | 0.01 | 0.02 | 0.03 | UNCLASS. H.C. C- 9 |
| 191 | 0.01 | 0.02 | 0.02 | UNCLASS. H.C. C-11 |

## Annex 2 Analytical Report

# Analytical Report

## Gasoline Isobutanol Vapor Condensate Analysis

## In Support of:

## Gasoline Isobutanol Vapor Condensate: Inhalation (Whole-Body) Embryo-Fetal Toxicity Study in Rats (GLP)

On 21 September 2015 the legal entity Huntingdon Life Sciences, Inc was renamed as Envigo CRS, Inc. No other changes to the legal entity have occurred.

| | |
|---|---|
| **Envigo study number:** | 14-4418 |
| **Method number:** | HLS-005-15R2 |
| **Version:** | Final Report |
| **Issue date:** | 18 March 2016 |

# Sponsor and Testing Facility Details

| | |
|---|---|
| **Sponsor** | Butamax Advanced Biofuels, LLC<br>200 Powder Mill Road<br>E356 Third Floor<br>Wilmington, DE 19880-0356<br>USA |
| **Testing Facility** | Envigo CRS, Inc.<br>Princeton Research Center<br>P.O. Box 2360<br>East Millstone, NJ 08875-2360<br>USA |

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# Signatures

## Gasoline Isobutanol Vapor Condensate Analysis

### Study Management

The [redacted]

[redacted] MA
Contributing Scientist
Formulation and Inhalation Analysis
Envigo

18 Mar 16
Date

### Scientific Review and Approval

The following scientist has reviewed and approved this report:

[redacted]

Nicki Iacono, BS
Vice President
Bioanalytical and Translational Sciences
Envigo

18 Mar 16
Date

# Study Personnel

## Study Management

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Lin Wang, MS
Analyst
Formulation and Inhalation Analysis

# General Preface

This section provides a key to abbreviations and formulas commonly used throughout this report.

## List of Abbreviations

| | |
|---|---|
| $CS_2$ | Carbon disulfide |
| GC | Gas chromatography |
| FIA | Formulation and Inhalation Analysis |
| FID | Flame ionization detection |
| HLS | Huntingdon Life Sciences |
| $mg/m^3$ | milligram/cubic meter |
| µm | micrometer |
| m | meter |
| mm | millimeter |
| mV | millivolt |
| min | minute |
| PRC | Princeton Research Center |

## Summary

Samples of the test substance (Gasoline Isobutanol Vapor Condensate) were analyzed to characterize at least ten major components (comprising at least 80% by weight of the test substance) to show test substance stability and comparison between the neat liquid test substance and the vaporized test atmospheres. The analytical method (HLS-005-15R2) was validated at Envigo in Study No. 15-8287. The method involved the extraction of Gasoline Isobutanol Vapor Condensate from charcoal tubes with Carbon Disulfide ($CS_2$). The major components of the test substance were then characterized (relative area percent) utilizing Gas Chromatography with Flame Ionization Detection (FID).

# 1. Experimental Procedures

The charcoal tubes from each exposure chamber were received from the Inhalation Department at Envigo. These samples were analyzed to determine the percent of total peak area of the major components of Gasoline Isobutanol Vapor Condensate listed in method HLS-005-15R2. The samples were extracted with Carbon Disulfide ($CS_2$). The extracted solutions were analyzed by Gas Chromatography equipped with a Supelco Petrocol™ DH 150 (150 m x 0.25 mm, 1.0 µm) column and Flame Ionization Detector (FID).

# 2. Materials

**Test substance:** Gasoline Isobutanol Vapor Condensate (Neat Material)

**Control vehicle (matrix):** Charcoal tube

# 3. Analysis

The analytical method (HLS-005-15R2) was validated by the department of Formulation and Inhalation Analysis at Envigo in Study No. 15-8287. Details of the analytical method and method validation are maintained in the study file for Study No. 15-8287.

## 3.1. Exposure concentration determination

During each exposure, one charcoal tube sample per chamber pretest and per week was analyzed by gas chromatography to characterize at least 10 major components (comprising at least 80% by weight of the test substance) to show test substance stability and provide a comparison between the neat liquid test substance and the vaporized test atmospheres. The charcoal tubes were stored refrigerated (2 to 8ºC) for up to 7 days (based on stability assessment in Envigo Study No. 15-8287) unless extracted and analyzed on the same day of collection.

# 4. Data Acquisition and Integration

All data collection, processing and storage were performed using the Perkin-Elmer Nelson TotalChrom version 6.2.1 installed on a personal computer.

# 5. Good Laboratory Practices

The study was conducted in compliance with the following Good Laboratory Practice standards:

Organization for Economic Cooperation and Development (OECD) Principles of Good Laboratory Practices ENV/MC/CHEM/ (98)17

United States Environmental Protection Agency 79.60, CFR Vol. 59, No. 122, 27 June 1994

# 6. Archiving of Data

All data documenting experimental details were recorded and maintained as raw data in appropriate laboratory binders. At the completion of the study, all reports and raw data will be maintained in the archives of Envigo for a period of 1 year after the submission of the signed final report, upon which time the client will be contacted to determine disposition of the records. Testing Facility-generated electronic raw data will be stored on the computer system on which the data application resides or archived off-line.

# 7. Results and Discussion

A summary of analytical runs is presented in Table 1. Typical GC chromatograms of Groups 1 through 4 are shown in Figure 1, Figure 2, Figure 3 and Figure 4.

Samples taken during the exposures were analyzed to determine the percent peak area of the test substance's major components in the chamber. The results of spiked control samples are presented in Table 2 and animal exposure results are presented in Table 3 through Table 6.

**Table 1 Analytical run summary**

| Date of Analysis | Analytical Run Number | Description |
|---|---|---|
| 01-02 June 2015 | 001 | Pretest |
| 04-05 June 2015 | 002 | Exposure Day 3 |
| 11-12 June 2015 | 003 | Exposure Day 10 |
| 18 June 2015 | 004 | Exposure Day 17 |

**Table 2 Spiked control samples**

(% Peak Area)

| Component ID | Pretest | | Exposure Day 3 | | Exposure Day 10 | | Exposure Day 17 | |
|---|---|---|---|---|---|---|---|---|
| | Spiked Control A | Spiked Control B | Spiked Control A | Spiked Control B | Spiked Control A | Spiked Control B | Spiked Control A | Spiked Control B |
| Isobutane | 5.2 | 5.2 | 7.1 | 7.3 | 7.3 | 7.0 | 8.0 | 7.5 |
| N-Butane | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 62.9 | 62.6 | 65.6 | 65.6 | 65.3 | 65.3 | 66.8 | 66.5 |
| N-Pentane | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 2.5 | 2.4 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| Cyclopentane | 5.7 | 5.7 | 5.3 | 5.3 | 5.3 | 5.3 | 5.2 | 5.3 |
| 2-Methylpentane | 0.5 | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.5 | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.8 | 0.8 | 0.7 | 0.7 | 0.7 | 0.7 | 0.6 | 0.7 |
| Isobutanol | 2.6 | 2.7 | 2.1 | 1.9 | 1.9 | 2.1 | 1.8 | 2.0 |
| Methylcyclopentane | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.8 | 0.8 | 0.7 | 0.7 | 0.7 | 0.7 | 0.6 | 0.6 |
| 3-Methylhexane | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 11.7 | 11.6 | 9.5 | 9.4 | 9.6 | 9.6 | 8.4 | 8.8 |
| 2,3,3-trimethylpentane | 5.8 | 6.1 | 4.7 | 4.9 | 5.0 | 5.1 | 4.3 | 4.5 |

**Table 3 Chamber components confirmation: Pretest**

Sequence #: 001

(% Peak Area)

| Component ID | Group 1 101 | Group 2 201 | Group 3 301 | Group 4 401 |
|---|---|---|---|---|
| Isobutane | 0.0 | 5.8 | 6.8 | 7.1 |
| N-Butane | 0.0 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 0.0 | 65.4 | 66.9 | 65.8 |
| N-Pentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 2.4 | 2.3 | 2.3 |
| Cyclopentane | 0.0 | 5.6 | 5.5 | 5.3 |
| 2-Methylpentane | 0.0 | 0.5 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.7 | 0.7 | 0.7 |
| Isobutanol | 0.0 | 2.3 | 2.1 | 2.4 |
| Methylcyclopentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.7 | 0.7 | 0.7 |
| 3-Methylhexane | 0.0 | 0.2 | 0.1 | 0.2 |
| 2,2,4-Trimethylpentane | 0.0 | 9.9 | 8.8 | 9.2 |
| 2,3,3-trimethylpentane | 0.0 | 5.2 | 4.5 | 4.8 |

**Table 4 Chamber components confirmation: Exposure Day 3**

Sequence #: 002

(% Peak Area)

| Component ID | Group 1 1001M | Group 2 2001M | Group 3 3001M | Group 4 4001M |
|---|---|---|---|---|
| Isobutane | 0.0 | 8.6 | 8.5 | 9.3 |
| N-Butane | 0.0 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 0.0 | 66.0 | 66.1 | 68.7 |
| N-Pentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 2.2 | 2.2 | 2.2 |
| Cyclopentane | 0.0 | 5.1 | 5.2 | 5.2 |
| 2-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.6 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 2.1 | 2.1 | 1.8 |
| Methylcyclopentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.6 | 0.6 | 0.5 |
| 3-Methylhexane | 0.0 | 0.1 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 8.7 | 8.5 | 6.8 |
| 2,3,3-trimethylpentane | 0.0 | 4.3 | 4.2 | 3.1 |

**Table 5 Chamber components confirmation: Exposure Day 10**

Sequence #: 003

(% Peak Area)

| Component ID | Group 1 1002M | Group 2 2002M | Group 3 3002M | Group 4 4002M |
|---|---|---|---|---|
| Isobutane | 0.0 | 7.1 | 9.1 | 9.0 |
| N-Butane | 0.0 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 0.0 | 66.9 | 66.8 | 66.1 |
| N-Pentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 2.2 | 2.2 | 2.2 |
| Cyclopentane | 0.0 | 5.2 | 5.0 | 5.0 |
| 2-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.6 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 2.3 | 1.9 | 2.1 |
| Methylcyclopentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.6 | 0.6 | 0.6 |
| 3-Methylhexane | 0.0 | 0.1 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 8.7 | 7.9 | 8.3 |
| 2,3,3-trimethylpentane | 0.0 | 4.5 | 4.0 | 4.2 |

**Table 6 Chamber components confirmation: Exposure Day 17**

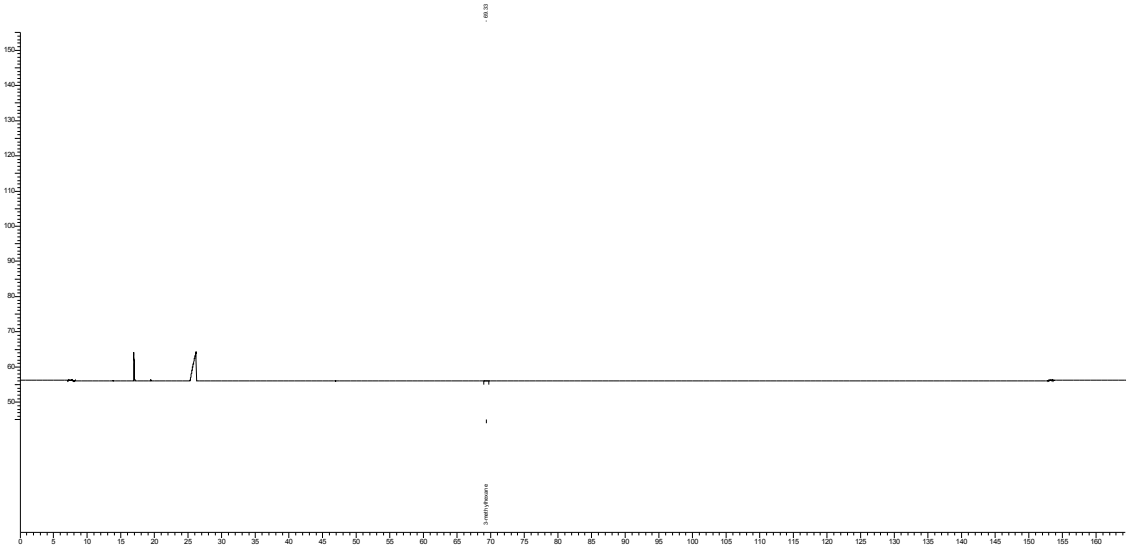
Sequence #: 004

(% Peak Area)

| Component ID | Group 1 1003M | Group 2 2003M | Group 3 3003M | Group 4 4003M |
|---|---|---|---|---|
| Isobutane | 0.0 | 8.7 | 9.2 | 9.0 |
| N-Butane | 0.0 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 0.0 | 67.0 | 66.1 | 66.2 |
| N-Pentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 2.2 | 0.2 | 2.2 |
| Cyclopentane | 0.0 | 5.1 | 5.0 | 5.0 |
| 2-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.6 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 1.9 | 2.0 | 2.0 |
| Methylcyclopentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.6 | 0.6 | 0.6 |
| 3-Methylhexane | 0.0 | 0.1 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 8.0 | 8.2 | 8.3 |
| 2,3,3-trimethylpentane | 0.0 | 4.0 | 4.2 | 4.3 |

**Figure 1 Typical GC chromatogram of Group 1 charcoal tube (0 mg/m$^3$)**

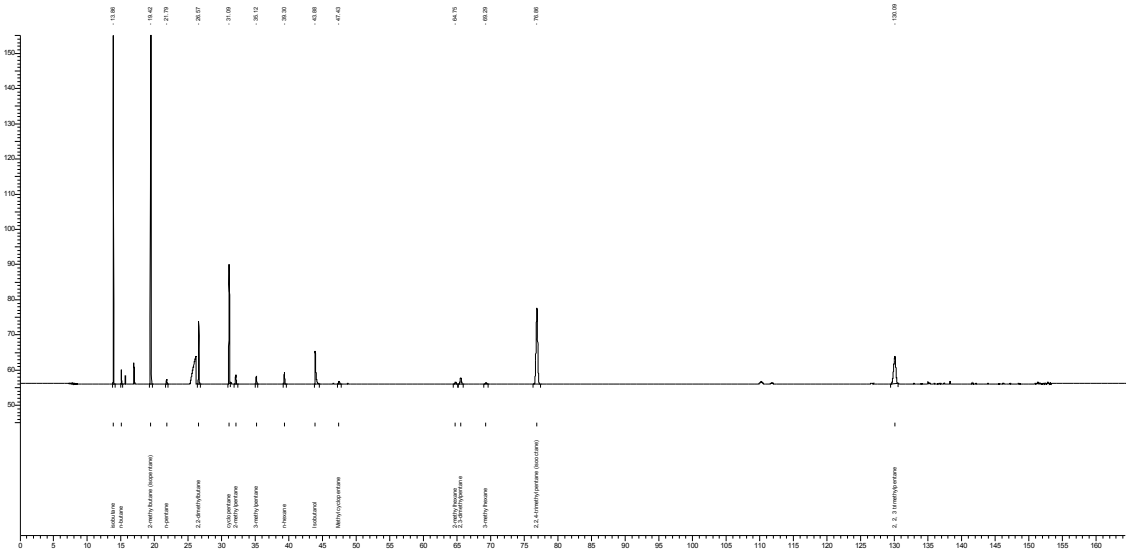
(File Name #: 002_003.rst, 14-4418)



**Response (mV) vs. Time (min.)**

**Figure 2 Typical GC chromatogram of Group 2 charcoal tube (2000 mg/m$^3$)**

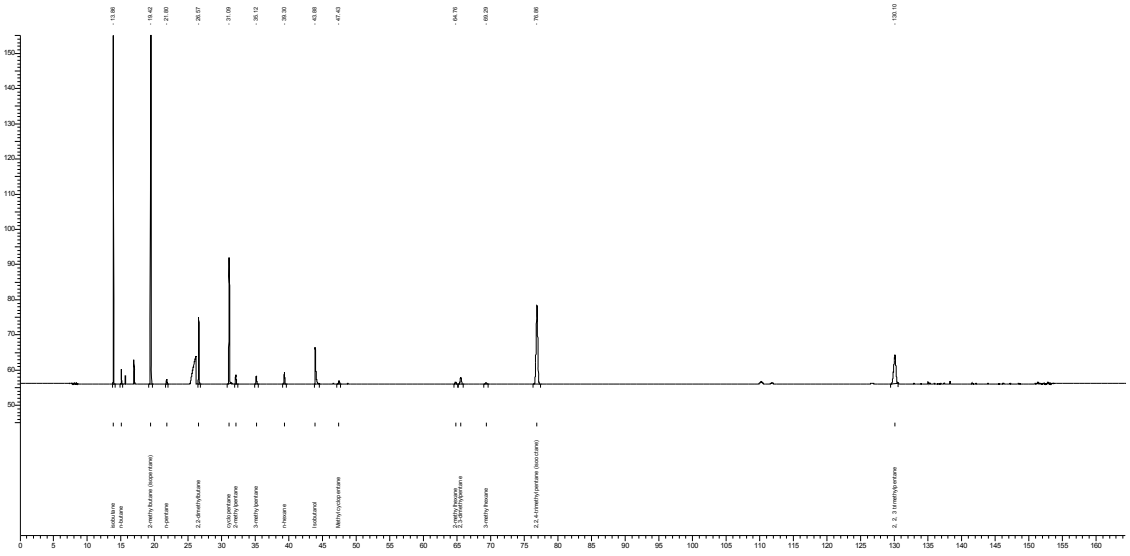
(File Name #: 002_004.rst, 14-4418)



**Response (mV) vs. Time (min.)**

**Figure 3 Typical GC chromatogram of Group 3 charcoal tube (10000 mg/m$^3$)**

(File Name #: 002_005.rst, 14-4418)

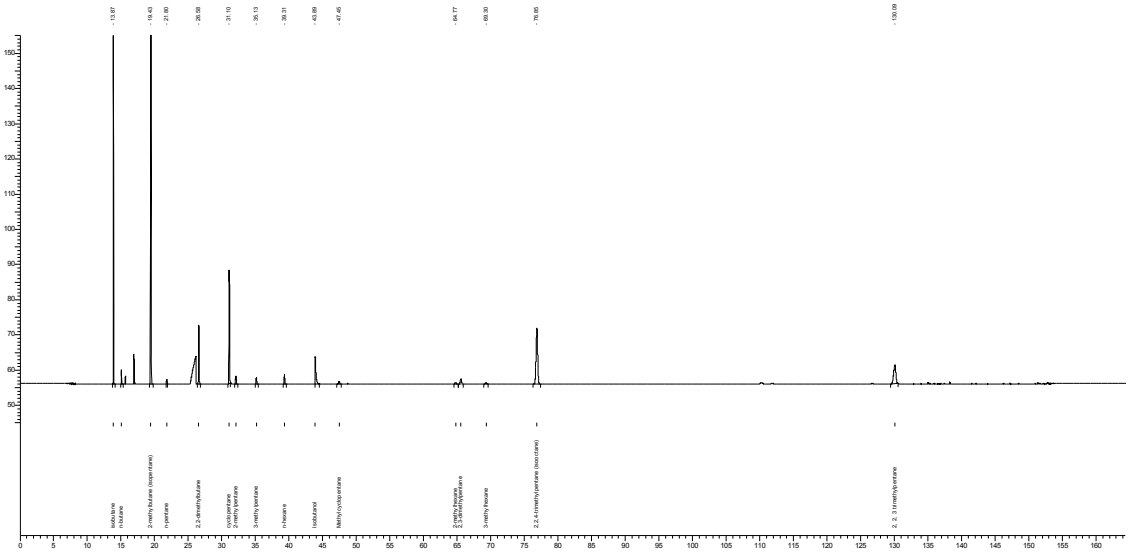


**Response (mV) vs. Time (min.)**

Envigo: 14-4418

**Figure 4 Typical GC chromatogram of Group 4 charcoal tube (20000 mg/m$^3$)**

(File Name #: 002_006.rst, 14-4418)



**Response (mV) vs. Time (min.)**

# Annex 3 Inhalation Technology Report

# Inhalation Technology Report

On 21 September 2015 the legal entity Huntingdon Life Sciences, Inc. was renamed as Envigo CRS, Inc. No other changes to the legal entity have occurred.

| | |
|---|---|
| **Envigo study number:** | 14-4418 |
| **Version:** | Final |
| **Issue Date:** | 17 March 2016 |

# SIGNATURE PAGE

The following contributing scientist was responsible for this portion of the study:

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Inhalation Toxicology

17 Mar 16
Date

# 1. Pre-study Atmosphere Characterization

Inhalation exposure system characterized including determinations of:

- Achieved concentration
- Homogeneity of test substance distribution in the chamber

# 2. Test Substance Handling and Processing for Atmosphere Generation

As supplied, Gasoline Isobutanol Vapor Condensate (GIVC) provided in small #33 cylinders and large 100 gallon bulk supply #420 cylinders.

- GIVC metered directly from small Sponsor cylinder as a liquid for daily use
- Small Sponsor cylinders re-filled from large bulk supply cylinders as needed throughout study

# 3. Exposure System

A schematic of the exposure system is presented in Figures 1 and 2. Components of the exposure system:

- Whole-body exposure chambers:
  - All Groups – 1000 L internal volume
- Animal Restraint:
  - Individually in whole-body restraint cages
- Atmosphere Generation System:
  - Single Sponsor cylinder per each test group (Groups 2 to 4)
  - Test substance vaporized by metering liquid from cylinders to a counter current glass volatilization vessel incorporating a heated glass helix
  - Test substance metering rate monitored continuously using in-line liquid flowmeters
  - Test substance vaporized into a low flow of nitrogen directed from the base of the chamber over the helix
  - Nitrogen gas flow monitored continuously using in-line gas flowmeters
  - Nitrogen purge flow over heating elements employed to minimize corrosion of nichrome heating wire
  - Vaporization temperature monitored continuously and adjusted as needed to maintain temperature in the range 20 to 40°C
  - Test substance vapor and nitrogen flow directed into the inlet of the 1000 L whole-body chamber
  - Test substance liquid flow adjusted as required based on Infrared Absorption Determination of the test substance concentrations
  - Room air and low nitrogen flow only delivered to Group 1 chamber

- Extract Airflow:
    - Drawn by in-house extract system
    - Drawn from base of exposure system
    - Filtered locally through a charcoal bed before discharge
    - Flow – individually calibrated to a minimum target of 200 L/minute:
        - Group 1 – 210 L/minute
        - Group 2 – 210 L/minute
        - Group 3 – 215 L/minute
        - Group 4 – 218 L/minute
- Airflow Monitoring:
    - Nitrogen flowmeters:
        - set to approximately 15 L/min for counter current flow
        - set to approximately 2 L/min purge flow
        - monitored continuously during exposures
        - recorded at 30 minute intervals
    - Magnehelic gauges for chamber airflow and differential exposure system pressure:
        - calibrated before study start
        - monitored continuously during exposures
        - recorded at 30 minute intervals

# 4. Administration

Exposure concentrations achieved by varying test substance flow rate.

Daily Procedure:

- Miran Infra-Red gas spectrophotometer calibration check performed
- Extract airflow run continuously
- Rats loaded into designated exposure chamber
- Nitrogen and test substance flows initiated
- Sponsor cylinder flows (Groups 2 to 4) established
- Animals exposed for 6 hours
- Exposure system operational parameters monitored continuously
- Chamber temperature, humidity, airflow rate and static pressure documented at approximately 30 minute intervals throughout exposure
- Generation terminated – test substance cylinders and nitrogen switched off
- Animals remained in chambers for minimum $T_{99}$ system clear out period
- Animals returned to home cage at end of exposure
- Animals exposed in the same chamber throughout the study

- Animal position in chamber rotated on a weekly basis

# 5. Atmosphere Analysis

## 5.1 Concentration

The atmosphere concentration was determined as follows:

- Atmosphere analysis - IR spectrophotometer
- Instrument and conditions - Wilks Miran 1A-CVF ambient air analyzer:
  - Wavelength – 9.6 µm (Groups 1 to 4)
  - Pathlength – 2.86 dial setting (Groups 1 to 4)
- Measurement frequency:
  - minimum of 4 samples/group/exposure
  - room air environmental monitoring pretest and at the beginning, middle and end of study
- Sample position remained constant - H1 for chamber concentration (See Figures 1 and 2); exposure room for room air

## 5.2 Test Substance Characterization

The test substance atmosphere was characterized for at least 10 major components as follows:

- Atmosphere analysis – gas chromatography:
  - Refer to Formulation and Inhalation Analysis Department Analytical Report 14-4418 for method details and results
- Sample media – charcoal tube (Supelco Orbo-32 Large)
- Sample flow rate – 0.75 L/min
- Sample duration:
  - 40 minutes (Groups 1 and 2)
  - 8 minutes (Group 3)
  - 4 minutes (Group 4)
- Frequency - minimum of 1 sample/chamber pre-test and per week of exposure
- Sample position remained constant

## 5.3 Particle Size Analysis

Performed to demonstrate the absence of any condensation aerosol as follows:

- Atmosphere analysis – TSI Aerodynamic Particle Sizer
- Qualified pre-study to determine presence or absence of aerosol
- Frequency - minimum of 1 sample/chamber and room environment/week of exposure
- Sample position remained constant

## 5.4 Chamber Temperature and Relative Humidity

Monitored using Extech Humidity and Thermometer gauges as follows:

- Frequency – continuous monitoring; documented every 30 minutes
- Sample location – gauges located inside the exposure chamber
- Sample position remained constant

## 5.5 Static Pressure and Chamber Airflow

Monitored using Dwyer Magnehelic gauges as follows:

- Frequency – continuous monitoring; documented every 30 minutes
- Sample location – gauges located outside the exposure chamber

## 5.6 Chamber Oxygen Levels

Chamber oxygen samples collected as follows:

- Sample media – ServoFlex MiniMP (5200) Gas Analyzer
- Sample frequency – confirmed pretest and at the beginning, middle and end of study
- Sample position remained constant

## 5.7 Exposure Room Environment

- Air sample – collected from exposure room in vapor generation area:
  - Atmosphere analysis - IR spectrophotometer
  - Sample frequency – confirmed pretest and at the beginning, middle and end of study
- Light – collected from exposure room:
  - Instrumentation – Quantum Instruments Photo-Meter 1
  - Maintained at approximately 30 to 40 foot-candles
  - measured at 1.0 meter above floor
  - Sample frequency – confirmed pretest and at the beginning, middle and end of study
- Sound – collected from exposure room:
  - Instrumentation – SPER Scientific Digital Sound Level Meter (840029)
  - Maintained below 85 decibels
  - Sample frequency – confirmed pretest and at the beginning, middle and end of study
- Room environmental monitoring evaluated at both the front and back of the exposure laboratory

## 5.8 Nominal Concentration

Calculated daily for each test substance exposure chamber.

# 6. Data, Abbreviations and Calculations

Data not presented here is retained in the study raw data.

To minimize cumulative errors from repeated rounding of numbers, data in this report has been calculated continuously using unrounded numbers and only rounded for printing. Consequently, presented data may include rounding errors in the last significant figure.

## 6.1 Abbreviations

| | | |
|---|---|---|
| A | = | Airflow |
| C | = | Celsius |
| Conc. | = | Mean atmosphere concentration (mg/m$^3$) |
| D | = | Duration of exposure |
| E | = | Exposure |
| IR | = | Infrared |
| L | = | Liter |
| Min | = | Minute |
| SD | = | Standard Deviation |
| Wt | = | Weight |

## 6.2 Calculations

The IR spectrophotometer was calibrated using test substance directly from the Sponsor cylinder. Absorbance measurements acquired by the IR spectrophotometer were used to calculate analyzed concentration (mg/m$^3$) using a 3$^{rd}$ order fit subjected to least squares regression analysis.

$$\text{Nominal Conc. (mg/m}^3\text{)} = \frac{\text{wt (g)}}{\text{A}\left(\frac{\text{L}}{\text{min}}\right)\text{x D(min)}} \text{ X } \frac{1000\text{ mg}}{1\text{ g}} \text{X} \frac{1000\text{ L}}{1\text{ m3}}$$

# 7. Results and Discussion

Results are presented in Tables 1 to 6 of this report.

## 7.1 Atmosphere Concentration

Overall mean atmosphere and nominal concentrations are presented in Table 1 and summarized below:

| Group | Atmosphere Concentration ($mg/m^3$) | | Nominal Concentration ($mg/m^3$) |
|---|---|---|---|
| | Target | Achieved | Achieved |
| 1 | 0 | 0 | - |
| 2 | 2000 | 2043 | 2455 |
| 3 | 10000 | 10410 | 11270 |
| 4 | 20000 | 20720 | 20280 |

No GIVC was detected in any of the Group 1 samples.

Mean atmosphere concentrations were 2.2%, 4.1% and 3.6% above target for Groups 2, 3 and 4, respectively.

For Group 2, the mean atmosphere concentration was 17% lower than the mean nominal concentration.

For Group 3, the mean atmosphere concentration was 7.6% lower than the mean nominal concentration.

For Group 4, the mean atmosphere concentration was 2.2% higher than the mean nominal concentration.

The differences between the nominal and measured concentrations for Groups 2 and 3 may be attributed to the limited sensitivity of the balance used to weigh test substance storage cylinders and the small volume of test substance dispensed during each exposure.

These values were considered a reasonable experimental difference as seen previously at this laboratory.

## 7.2 Chamber Temperature and Relative Humidity

Overall mean chamber temperature and relative humidity is presented in Tables 2 and 3 and summarised below:

| Group | Temperature (°C) | Relative Humidity (%) |
|---|---|---|
| 1 | 20 | 54 |
| 2 | 21 | 52 |
| 3 | 20 | 56 |
| 4 | 20 | 54 |

There were occasions throughout the study where the temperature and relative humidity deviated from the target range in the protocol. The daily mean temperature ranged from 17 – 22°C and daily mean relative humidity ranged from 49 –62%. Although there were deviations from the design exposure conditions it was not considered to have been of sufficient magnitude to have impacted the outcome of the study. Overall study means for all groups were consistent for temperature and humidity.

## 7.3 Particle Size

Particle size analysis confirmed the absence of condensation aerosol in all groups during pretest evaluations and throughout the study (Table 4).

## 7.4 Chamber Oxygen

Individual and overall mean chamber oxygen levels are presented in Table 5. Overall on-test mean exposure values are summarised below:

| Group | Oxygen (%) |
|---|---|
| 1 | 19.2 |
| 2 | 19.1 |
| 3 | 19.2 |
| 4 | 19.2 |

Oxygen levels during animal exposure met protocol requirements of 19% or higher.

## 7.5 Room Environment

Individual (beginning, middle and end of study) and overall mean room air values, light and sound monitoring are presented in Table 6.

Air samples collected from the exposure room (front and back) confirmed the absence of GIVC.

Overall mean light reading for the front room was 36.7 foot candles with values ranging from 35.5 to 38.5 foot candles.

Overall mean light reading for the back room was 36.9 foot candles with values ranging from 35.6 to 38.3 foot candles.

Overall mean noise level for the front room was 61.2 decibels with values ranging from 59.2 to 63.0 decibels.

Overall mean noise level for the back room was 61.7 decibels with values ranging from 60.0 to 62.6 decibels.

All room environmental monitoring was within protocol specifications.

**Figure 1 Schematic of Inhalation Exposure System – Control System**

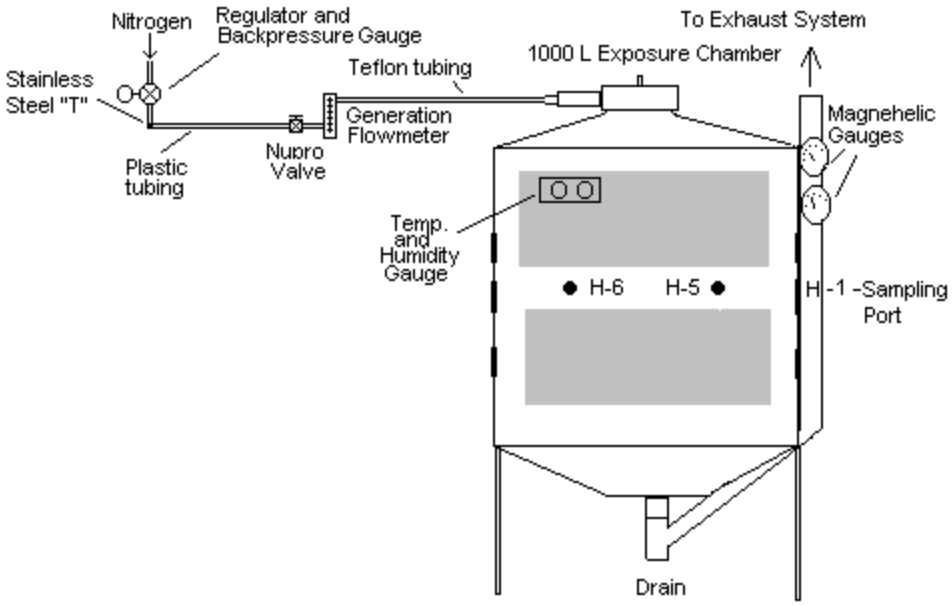

**Figure 2 Schematic of Inhalation Exposure System – Test System**

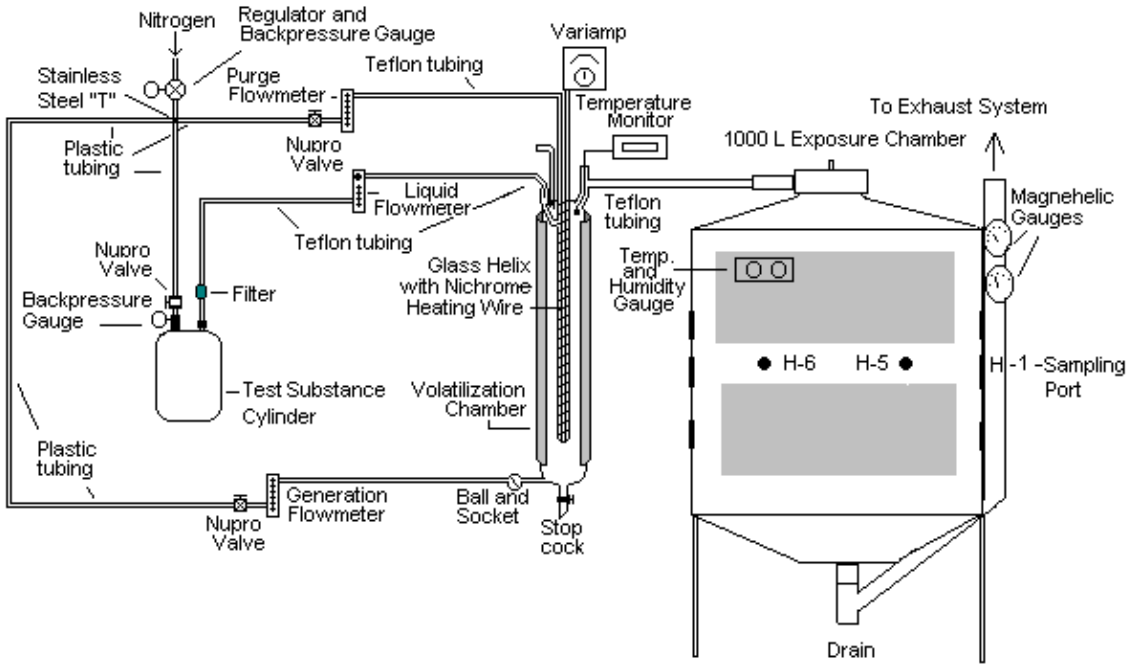

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) Values**

| Exp Day | Group 1 - Determined Concentration ($mg/m^3$)[a] | | | | | |
|---|---|---|---|---|---|---|
| | Individual Chamber Samples | | | | Mean | Nominal |
| 1 - 18 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | N/A |
| Mean | | | 0.000 | | - | |
| SD | | | - | | - | |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) Values (Cont.)**

| Exp Day | Group 2 - Determined Concentration (mg/m$^3$)[a] | | | | | |
|---|---|---|---|---|---|---|
| | Individual Chamber Samples | | | | Mean | Nominal |
| 1 | 1843 | 2740 | 1897 | 2112 | 2148 | 2487 |
| 2 | 2415 | 1890 | 1986 | 2035 | 2082 | 2474 |
| 3 | 1742 | 1624 | 2053 | 2325 | 1936 | 2460 |
| 4 | 1786 | 2223 | 2028 | 2157 | 2049 | 2407 |
| 5 | 1580 | 2166 | 2296 | 2121 | 2041 | 2407 |
| 6 | 1828 | 1628 | 1646 | 1875 | 1744 | 2063 |
| 7 | 2305 | 1646 | 1890 | 1923 | 1941 | 2302 |
| 8 | 1930 | 1665 | 1875 | 2371 | 1960 | 2249 |
| 9 | 2482 | 1984 | 1935 | 1672 | 2018 | 2302 |
| 10 | 2348 | 2305 | 2130 | 2026 | 2202 | 2619 |
| 11 | 2073 | 2261 | 2186 | 2130 | 2163 | 2407 |
| 12 | 2013 | 1890 | 1877 | 1912 | 1923 | 2328 |
| 13 | 1768 | 1731 | 1855 | 1674 | 1757 | 2275 |
| 14 | 1498 | 2752 | 1923 | 2360 | 2133 | 2804 |
| 15 | 2477 | 2341 | 2346 | 2164 | 2332 | 2672 |
| 16 | 2227 | 2234 | 2302 | 2161 | 2231 | 2672 |
| 17 | 2137 | 2085 | 2159 | 1883 | 2066 | 2566 |
| 18 | 1946 | 2280 | 1984 | 2006 | 2054 | 2698 |
| Mean | 2043 | | | | - | 2455 |
| SD | 266 | | | | - | 190 |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) Values (Cont.)**

| Exp Day | Group 3 - Determined Concentration (mg/m$^3$)[a] | | | | | |
|---|---|---|---|---|---|---|
| | Individual Chamber Samples | | | | Mean | Nominal |
| 1 | 8203 | 10550 | 11990 | 10460 | 10300 | 11320 |
| 2 | 12660 | 11510 | 11030 | 11060 | 11570 | 12120 |
| 3 | 11240 | 11510 | 10670 | 10460 | 10970 | 11600 |
| 4 | 10130 | 10250 | 10490 | 10250 | 10280 | 10980 |
| 5 | 10250 | 10370 | 10280 | 10700 | 10400 | 11140 |
| 6 | 10640 | 11330 | 10790 | 10100 | 10720 | 11890 |
| 7 | 9981 | 10190 | 9333 | 11480 | 10250 | 11060 |
| 8 | 9981 | 10100 | 10400 | 9922 | 10100 | 10830 |
| 9 | 10070 | 10070 | 10010 | 10010 | 10040 | 11190 |
| 10 | 9981 | 10550 | 10280 | 10100 | 10230 | 11240 |
| 11 | 10370 | 10010 | 10160 | 10640 | 10300 | 11210 |
| 12 | 10970 | 10580 | 10760 | 10340 | 10660 | 10960 |
| 13 | 10340 | 10370 | 9981 | 10190 | 10220 | 11030 |
| 14 | 9863 | 10460 | 10010 | 10370 | 10180 | 11190 |
| 15 | 10700 | 10370 | 10400 | 9981 | 10360 | 11190 |
| 16 | 9804 | 10250 | 10610 | 10340 | 10250 | 11140 |
| 17 | 10520 | 10310 | 11330 | 10130 | 10570 | 11450 |
| 18 | 9952 | 9922 | 10430 | 9509 | 9953 | 11270 |
| Mean | 10410 | | | | - | 11270 |
| SD | 607 | | | | - | 324 |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) Values (Cont.)**

| Exp Day | Group 4 - Determined Concentration ($mg/m^3$)[a] | | | | | |
|---|---|---|---|---|---|---|
| | Individual Chamber Samples | | | | Mean | Nominal |
| 1 | 18150 | 20730 | 19760 | 20460 | 19780 | 20720 |
| 2 | 18050 | 19610 | 20250 | 20610 | 19630 | 20670 |
| 3 | 20160 | 20100 | 20760 | 20580 | 20400 | 20720 |
| 4 | 20160 | 21540 | 21360 | 21210 | 21070 | 21200 |
| 5 | 22830 | 21630 | 21390 | 21030 | 21720 | 20850 |
| 6 | 20730 | 20730 | 22800 | 21870 | 21530 | 21150 |
| 7 | 20730 | 20970 | 21420 | 21300 | 21110 | 20460 |
| 8 | 20760 | 21030 | 20730 | 20130 | 20660 | 20570 |
| 9 | 21150 | 21120 | 21600 | 21300 | 21290 | 20210 |
| 10 | 20250 | 20340 | 20100 | 20490 | 20300 | 19420 |
| 11 | 22400 | 20550 | 21920 | 20310 | 21300 | 19620 |
| 12 | 21120 | 21330 | 21870 | 21180 | 21380 | 19290 |
| 13 | 19060 | 21240 | 21630 | 20100 | 20510 | 20260 |
| 14 | 19280 | 20550 | 20430 | 20520 | 20200 | 19720 |
| 15 | 21510 | 21330 | 20910 | 20730 | 21120 | 20310 |
| 16 | 20070 | 21330 | 20820 | 20610 | 20710 | 20180 |
| 17 | 19800 | 20370 | 20190 | 19610 | 19990 | 19440 |
| 18 | 20460 | 20280 | 20460 | 20190 | 20350 | 20180 |
| Mean | 20720 | | | | - | 20280 |
| SD | 852 | | | | - | 583 |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

**Table 2 Chamber Temperature - Mean Values**

| Exposure Day | Temperature (°C)[a] | | | |
|---|---|---|---|---|
| | Group 1 | Group 2 | Group 3 | Group 4 |
| 1 | 18 | 18 | 17 | 18 |
| 2 | 18 | 19 | 18 | 18 |
| 3 | 19 | 20 | 18 | 19 |
| 4 | 20 | 20 | 19 | 20 |
| 5 | 20 | 20 | 19 | 20 |
| 6 | 21 | 21 | 19 | 20 |
| 7 | 20 | 20 | 19 | 20 |
| 8 | 21 | 21 | 20 | 20 |
| 9 | 22 | 22 | 21 | 22 |
| 10 | 21 | 21 | 20 | 21 |
| 11 | 21 | 22 | 21 | 21 |
| 12 | 22 | 22 | 21 | 22 |
| 13 | 22 | 22 | 21 | 22 |
| 14 | 21 | 22 | 21 | 21 |
| 15 | 22 | 22 | 21 | 22 |
| 16 | 20 | 21 | 20 | 21 |
| 17 | 19 | 20 | 19 | 20 |
| 18 | 18 | 19 | 18 | 19 |
| Mean | 20 | 21 | 20 | 20 |
| SD | 1.4 | 1.2 | 1.3 | 1.3 |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

**Table 3 Chamber Relative Humidity - Mean Values**

| Exposure Day | Relative Humidity (%)[a] | | | |
|---|---|---|---|---|
| | Group 1 | Group 2 | Group 3 | Group 4 |
| 1 | 57 | 54 | 58 | 56 |
| 2 | 55 | 53 | 56 | 54 |
| 3 | 53 | 51 | 55 | 52 |
| 4 | 52 | 51 | 54 | 53 |
| 5 | 53 | 52 | 55 | 53 |
| 6 | 54 | 52 | 56 | 54 |
| 7 | 52 | 49 | 53 | 50 |
| 8 | 53 | 51 | 56 | 54 |
| 9 | 60 | 57 | 62 | 60 |
| 10 | 53 | 51 | 54 | 52 |
| 11 | 54 | 51 | 56 | 53 |
| 12 | 53 | 50 | 55 | 53 |
| 13 | 51 | 49 | 53 | 51 |
| 14 | 53 | 50 | 55 | 51 |
| 15 | 56 | 55 | 59 | 57 |
| 16 | 55 | 53 | 57 | 56 |
| 17 | 54 | 51 | 54 | 53 |
| 18 | 56 | 53 | 56 | 54 |
| Mean | 54 | 52 | 56 | 54 |
| SD | 2.1 | 2.1 | 2.2 | 2.4 |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

## Table 4 Particle Size Analysis – Evaluation for Condensation Aerosol in Chambers

| Exposure Day | Condensation Aerosol Evaluation[a] | | | |
|---|---|---|---|---|
| | Group 1 | Group 2 | Group 3 | Group 4 |
| Pretest | Absent | Absent | Absent | Absent |
| Beginning | Absent | Absent | Absent | Absent |
| Middle | Absent | Absent | Absent | Absent |
| End | Absent | Absent | Absent | Absent |

[a] Condensation aerosol within the chambers was determined as either present or absent.

## Table 5 Chamber Oxygen Level – Individual and Mean Values

| Exposure Day | Oxygen (%)[a] | | | |
|---|---|---|---|---|
| | Group 1 | Group 2 | Group 3 | Group 4 |
| Pretest | 19.9 | 19.4 | 19.2 | 19.2 |
| Beginning | 19.2 | 19.2 | 19.2 | 19.4 |
| Middle | 19.0 | 19.0 | 19.0 | 19.0 |
| Middle[b] | 19.3 | 19.0 | 19.1 | 19.3 |
| End | 19.4 | 19.0 | 19.3 | 19.1 |
| On-test Mean[c] | 19.2 | 19.1 | 19.2 | 19.2 |
| On-test SD[c] | 0.17 | 0.10 | 0.13 | 0.18 |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.
[b] Additional sampling occasion to confirm initial Middle sample occasion; included in mean.
[c] Excludes pretest values; on-test exposure values only.

## Table 6 Exposure Room Environmental Monitoring

| Exposure Week | Room Air Conc.[a] mg/m$^3$ | | Light Foot Candles | | Noise Decibels | |
|---|---|---|---|---|---|---|
| | Front | Back | Front | Back | Front | Back |
| Pretest | 0 | 0 | 38.0 | 36.9 | 73.5 | 78.5 |
| Beginning | 0 | 0 | 35.5 | 38.3 | 61.3 | 62.6 |
| Middle | 0 | 0 | 36.0 | 36.9 | 59.2 | 62.6 |
| End | 0 | 0 | 38.5 | 35.6 | 63.0 | 60.0 |
| On-test Mean[b] | 0 | 0 | 36.7 | 36.9 | 61.2 | 61.7 |
| On-test SD[b] | - | - | 1.61 | 1.35 | 1.90 | 1.50 |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.
[b] Excludes pretest values; on-test exposure values only.

# Appendix F
# Toxicology Report for Gasoline Isobutanol Vapor Condensate: A One-Generation Inhalation (Whole-body) Reproduction Toxicity Study in Rats

# REPORT

# Gasoline Isobutanol Vapor Condensate: A One-Generation Inhalation (Whole-Body) Reproduction Toxicity Study in Rats

On 21 September 2015 the legal entity Huntingdon Life Sciences, Inc was renamed as Envigo CRS, Inc. No other changes to the legal entity have occurred.

| | |
|---|---|
| **Envigo study number:** | 14-4417 |
| **Version ID:** | Final |
| **Issue date:** | 30 March 2016 |

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# Statement of Compliance

## Gasoline Isobutanol Vapor Condensate: A One-Generation Inhalation (Whole-Body) Reproduction Toxicity Study in Rats

This study was conducted in compliance with the following Good Laboratory Practice standards:

> United States Environmental Protection Agency's Good Laboratory Practice Standards (US EPA 79.60, CFR Vol. 59, No. 122, 27 June 1994).

With the exception of the following that were not considered to have impacted the validity or integrity of the study:

> The expiry date for the test substance is not available but the stability of the test substance was confirmed by the atmosphere GC analysis during the conduct of the study.
>
> Test substance analysis by Chevron Energy & Technology Company was performed under non-GLP
>
> On the day that the $F_0$ animals arrived, they were not assigned a temporary identification number other than the cage card. Because they were double-housed, it was not possible to determine the identity of each animal until they were tattooed with their permanent identification number.

Statistical Analysis performed at Envigo-UK was conducted in compliance with the following Good Laboratory Standards:

> The UK Good Laboratory Practice Regulations (Statutory Instrument 1999 No. 3106, as amended by Statutory Instrument 2004 No. 994)
>
> EC Commission Directive 2004/10/EC of 11 February 2004 (Official Journal No. L 50/44)
>
> Organization for Economic Cooperation and Development (OECD) Principles of Good Laboratory Practice ENV/MC/CHEM/(98)17.

[redacted]

Gary M. Hoffman, BA, DABT
Study Director
Envigo

30 MARCH 2016
Date

# Signature Page

## Gasoline Isobutanol Vapor Condensate: A One-Generation Inhalation (Whole-Body) Reproduction Toxicity Study in Rats

The following Scientist was responsible for the overall conduct of this study:

[redacted] 30 MARCH 2016

Gary M. Hoffman, BA, DABT
Study Director
Envigo

Date

The following Scientists have reviewed and approved this report:

[redacted] 29 MAR 16

Robert M. Parker, PhD, DABT
Study Director
Director of Developmental and Reproductive
Toxicology, Safety Assessment
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Date

[redacted] 29 Mar 16

Cynthia Willard-Mack, VMD, PhD
Director of Pathology
Envigo

Date

# Quality Assurance Statement

## Gasoline Isobutanol Vapor Condensate: A One-Generation Inhalation (Whole-Body) Reproduction Toxicity Study in Rats

Listed below are the dates that this study was inspected by the Quality Assurance Unit of Envigo, East Millstone, New Jersey, and the dates that findings were reported to the Study Director and Management. This report reflects the raw data as far as can be reasonably established.

| Type of Inspection | Date(s) of Inspection | Reported to Study Director and Management |
|---|---|---|
| GLP Protocol Review | 26 Feb 15 | 26 Feb 15 |
| Exposure Monitoring and Pharmacy Data Review | 17, 19 Mar 15 | 19 Mar 15 |
| Estrous Smear Evaluations and Training Records | 13 May 15 | 13 May 15 |
| Exposure Monitoring and Protocol Amendment 1 | 26 Jun 15 | 26 Jun 15 |
| Male Necropsy, Sperm Assessment, Equipment Records and Protocol Amendment 2 | 9-10 Jul 15 | 10 Jul 15 |
| Dose Formulation Analytical Report and Data | 22-23, 26 Oct 15 | 29 Oct 15 |
| InhalationTechnology Report, Inhalation Study Data and Protocol Amendments 2-4 | 15, 20-23, 26-30 Oct 15 | 30 Oct 15 |
| Draft Final Report Text, Tables, Appendices, Data, Anatomic Pathology and Statistical Analysis Report | 07, 11-12, 14, 18-20, 22, 25-29 Jan 16, 01 Feb 16 | 01 Feb 16 |
| Protocol Amendment 5 | 24 Feb 16 | 24 Feb 16 |
| Final Report Review and Results and Discussion | 11, 14-16 Mar 16 | 16 Mar 16 |

[redacted]

Suzanne Burke, B.A
Quality Assurance Auditor

30 Mar 16
Date

# Details of Sponsor, Test Facility and Test Site(s)

| | |
|---|---|
| **Sponsor** | Butamax Advanced Biofuels, LLC<br>200 Powder Mill Road<br>E356 Third Floor<br>Wilmington, Delaware 19880-0356 |
| **Test facility** | Envigo<br>PO Box 2360<br>Mettlers Road<br>East Millstone, New Jersey 08875-2360 |

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| | |
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| **Vice President, Bioanalytical and Translational Sciences** | Nicki Iacono, BS |
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| **Necropsy, Fetal Pathology, Histology and Sample Logistics** | Lakisha Key-Faulk, BS |
| **Responsible Scientist, Pathologist** | Cynthia L. Courtney DVM, DACVP |
| **Responsible Scientist, Dose Formulation Analysis** | Yonggang Wang, MA |
| **Principal Investigator/Responsible Scientist, Statistical Analysis** | Gareth D. Thomas, BSc |
| **Responsible Scientist, Aerosol Technologist** | Justine M. Damiano, BS |

# Summary

## Gasoline Isobutanol Vapor Condensate: A One-Generation Inhalation (Whole-Body) Reproduction Toxicity Study in Rats

This study was designed to assess the potential reproductive toxicity of Gasoline Isobutanol Vapor Condensate when administered via whole-body inhalation exposures to Sprague Dawley rats (26/sex/group). The test substance was administered at target concentrations of 2,000, 10,000 and 20,000 mg/m$^3$ for 6 hours/day, 7 days/week for 10 weeks before mating, for 21 days during mating, for 3 weeks during gestation and for 4 weeks during the postnatal phase. In addition, a control group (26/sex) received air only while in chamber. Exposure levels were determined using an infra-red spectrophotometer 4 times per chamber per day. Additionally, the test substance's major components were assayed once per chamber per week. Particle size distribution measurements were also made once per chamber per week using a TSI Aerodynamic Particle Sizer.

Viability checks were performed twice daily to check for mortality and signs of severe toxic or pharmacologic effects. Physical observations and body weight measurements were made at least twice pretest and at least weekly during the study. Feed consumption measurements were obtained beginning the week prior to treatment initiation and at least weekly during the study. All $F_0$ male animals were sacrificed after the last pups had been delivered. All $F_0$ female animals were sacrificed on Lactation Day 22. For all parental animals, selected organs were weighed and organ/body weight and organ/brain weight ratios calculated. Complete macroscopic postmortem examinations were performed on $F_0$ animals. Histopathological evaluations of selected tissues were conducted on selected $F_0$ animals.

Pups ($F_1$ generation) were observed as soon as possible after delivery for their sex, the number of live and dead pups and pup abnormalities. Thereafter, litters were observed twice daily. On the 4th day after parturition, litters with more than ten pups were randomly culled to ten pups with sex distribution equalized when possible. Pups were given a gross physical examination, were weighed and were sexed frequently through the 21$^{st}$ day after parturition at which time they were sacrificed. A macroscopic postmortem evaluation and the weighing of selected organs were performed on selected pups.

Gas chromatography (GC) analysis of the major components in the neat test substance and the test atmospheres showed a reasonably close comparison between the neat test substance and the vaporized test substance. These data demonstrated that the test animals were exposed, as expected, to all of the major components of the test substance in their reasonably proper proportion. The data were consistent from week-to-week during the study indicating stability of the test substance and the atmosphere generation techniques.

Overall target, nominal and achieved (per IR [infrared] analysis) mean exposure concentrations are summarized below:

| Group | Test Substance | Atmosphere Concentration (mg/m$^3$) | | |
|---|---|---|---|---|
| | | Target | Nominal | Achieved |
| 1 | Air Control | 0 | 0 | 0 |
| 2 | Gasoline Isobutanol Vapor Condensate | 2,000 | 2,873 | 2,089 |
| 3 | Gasoline Isobutanol Vapor Condensate | 10,000 | 11,390 | 10,240 |
| 4 | Gasoline Isobutanol Vapor Condensate | 20,000 | 23,290 | 20,410 |

By IR analysis, Group 1 occasionally showed low concentrations of the test substance (mean concentrations ranged from 0.506 to 7.598 mg/m$^3$) however, for the majority of the study no Gasoline Isobutanol Vapor Condensate was detected.

Mean achieved atmosphere concentrations were 4.5%, 2.4% and 2.1% above target for Groups 2, 3 and 4, respectively.

The differences between the nominal and measured concentrations for Groups 2 and 3 may be attributed to the limited sensitivity of the balance used to weigh test substance storage cylinders and the small volume of test substance dispensed during each exposure.

Particle size analysis confirmed the absence of condensation aerosol in all groups during pretest evaluations and throughout the study.

All animals survived until the completion of exposures except one 10,000 mg/m$^3$ male was euthanized on day 39 of the precohabitation period and one female in the 20,000 mg/m$^3$ group was found dead on gestation day 22. These deaths were not considered test substance-related.

Whole-body inhalation exposure to Gasoline Isobutanol Vapor Condensate at 2,000, 10,000 and 20,000 mg/m$^3$ was not associated with any adverse effects on male and female rats and their pups as an evaluation of the integrity and performance of the male and female reproductive systems, including gonadal function, the estrous cycle, mating behavior, conception, gestation, parturition and lactation. This study also provided information about the absence of adverse effects of the test substance on neonatal morbidity and mortality, and data on prenatal and postnatal developmental toxicity.

Under the conditions of this study, the NOAEL (no observable adverse effect level) for Gasoline Isobutanol Vapor Condensate was considered to be 20,000 mg/m$^3$ for reproductive toxicity.

# 1. Introduction

## 1.1 Objective

The purpose of this reproduction study was to provide general information concerning the effects of Gasoline Isobutanol Vapor Condensate (gasoline with a new oxygenate) on the integrity and performance of the male and female reproductive systems, including gonadal function, the estrous cycle, mating behavior, conception, gestation, parturition and lactation. This study provided information about the effects of the test substance on neonatal morbidity and mortality, and data on prenatal and postnatal developmental toxicity.

## 1.2 Regulatory compliance

### 1.2.1 Test guidelines

This study was designed to meet or exceed the pertinent requirements of:

> US EPA Vehicle Emissions Inhalation Exposure Guideline 79.61, CFR Vol. 59, No. 122, 27 June 1994
>
> US EPA (Environmental Protection Agency) Health Effects Test Guidelines, OPPTS 870.3800, Reproduction and Fertility Effects (August 1998) except this study only continued through the 1st generation of offspring.

### 1.2.2 Good laboratory practices

This study was conducted in compliance with the following Good Laboratory Practice standards:

> United States Environmental Protection Agency's Good Laboratory Practice Standards (US EPA 79.60, CFR Vol. 59, No. 122, 27 June 1994).

With the exception of the following that were not considered to have impacted the validity or integrity of the study:

> The expiry date for the test substance is not available but the stability of the test substance was confirmed by the atmosphere GC analysis during the conduct of the study.
>
> Test substance analysis by Chevron Energy & Technology Company was performed under non-GLP.
>
> On the day that the $F_0$ animals arrived, they were not assigned a temporary identification number other than the cage card. Because they were double-housed, it was not possible to determine the identity of each animal until they were tattooed with their permanent identification number.

Statistical Analysis performed at Envigo-UK was conducted in compliance with the following Good Laboratory Standards:

The UK Good Laboratory Practice Regulations (Statutory Instrument 1999 No. 3106, as amended by Statutory Instrument 2004 No. 994)

EC Commission Directive 2004/10/EC of 11 February 2004 (Official Journal No. L 50/44)

Organization for Economic Cooperation and Development (OECD) Principles of Good Laboratory Practice ENV/MC/CHEM/(98)17.

### 1.2.3 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.

## 1.3 Test system

Non-clinical studies in a rodent species are required by the US EPA to evaluate potential occupational and environmental exposure to humans. The rat is used as a surrogate for humans in the detection of reproductive effects and is a species in which known reproductive toxicants have been detected. In addition, a historical control database with this strain of animal and supplier is available for comparative evaluation.

## 1.4 Route, duration and frequency of administration

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 making occupational and environmental health risk assessments and as per US EPA guidelines. This study was intended to support uses of the test substance that could lead to exposure of humans, by evaluating fertility, gestation, and lactation, as well as fetal development and maturation.

## 1.5 Exposure level

The exposure levels were based on the lower explosive limit (LEL) of the test substance such that the low and high exposure levels were ~ 5 and ~50% of the LEL. The high exposure level was considered to be the highest safe exposure level for laboratory use. Multiple gasoline products (including neat gasoline, gasoline with other oxygenates and this test substance) have been safely prior tested at this Testing Facility at these same exposure levels for up to 20 weeks of daily exposures without any clinical signs.

Neat isobutanol has been prior tested with clinical signs of hypoactivity, diminished startle reflex and decreased motor activity in the range of exposure levels of 7,580 to 18,120 mg/m$^3$. The test

substance to be tested in this study contains ~2-3% isobutanol thus the high exposure level of ~20,000 mg/m$^3$ of test substance only provided an exposure of ~400-600 mg/m$^3$ of isobutanol. Thus, similar clinical signs were not expected in this study that would test gasoline blended with isobutanol.

A two week inhalation range-finding toxicity study (Envigo Study No. 14-6484) with this test substance was completed at exposure levels of 2,000 and 20,000 mg/m$^3$ without any clinical signs. A thirteen week inhalation toxicity study (Envigo Study No. 14-6485) with this test substance was completed at exposure levels of 2,000 and 10,000 and 20,000 mg/m$^3$ without any clinical signs.

## 1.6 Number of animals

The number of animals in this study was considered to be the minimum necessary for statistical, regulatory and scientific reasons. The number of treatment groups and the number of animals per sex per treatment group are defined as per US EPA guidelines in Section 16.1. Twenty (20) pregnancies per group are considered an adequate number, by regulatory guidelines, for evaluating for reproductive and developmental toxicities. The group size of 26 males and 26 females used in this study, retaining a one male to one female pairing ratio, with expected pregnancy rates of 80-100%, was anticipated to provide at most 130 male and 130 female $F_1$ pups per group (after culling on PND 4) for postnatal development evaluations.

Three test substance-treated groups receiving low, medium and high exposure levels and a negative air control group were considered the minimum number of groups necessary to provide a range of effects and allow for extrapolation of results to humans.

# 2. Experimental Procedure

## 2.1 Study schedule and structure

### 2.1.1 Study dates

| | |
|---|---|
| Study initiation: | 2 March 2015 (Date Study Director signed the Protocol) |
| Animal receipt: | 3 March 2015 (Experimental Start Date) |
| Exposure initiation $F_0$ generation (initiation of pre-mating treatment period): | 17 March 2015 |
| Mating interval $F_0$ generation: | 26 May to 16 June 2015 |
| Exposure termination: | 5, 7, and 8 July 2015 ($F_0$ males)<br>9, 10, 11, and 13 July 2015 ($F_0$ females and $F_1$ pups) |
| Necropsy: | 6, 8 and 9 July 2015 ($F_0$ males)<br>8 to 15 July 2015 ($F_0$ females and $F_1$ pups) |
| Experimental termination date: | 29 March 2016 (Date of last data collection) |
| Study completion: | 30 March 2016 (Date Study Director signed the Final Report) |

### 2.1.2 Experimental outline

The test substance or air control was administered via whole-body inhalation, to rats, for 6 hours/day during the exposure period.

$F_0$ males and females received at least 70 consecutive days (10 weeks) of exposure prior to mating and continued to be exposed daily throughout a 21 day cohabitation period.

Mated females were exposed daily from Gestation Day (GD) 0 through 18.

Lactating $F_0$ females were exposed daily beginning on Lactation Day (LD) 5 until sacrifice of the $F_1$ offspring on LD 21.

$F_0$ females with no confirmed day of mating continued to be exposed for 25 days following completion of the mating period.

$F_0$ females with a confirmed day of mating that did not deliver were euthanized on presumed GD 25.

$F_0$ males were exposed daily until euthanasia which occurred after delivery of the last $F_1$ litter.

The study consisted of 1 control and 3 treated groups identified as follows:

| Group | Test Substance | Target Exposure ($mg/m^3$)[a] | Number of animals | | | |
|---|---|---|---|---|---|---|
| | | | $F_0$ | | $F_1$[b] | |
| | | | Male | Female | Male | Female |
| 1 | Air Control | 0 | 26 | 26 | 130 | 130 |
| 2 | Gasoline Isobutanol Vapor Condensate | 2,000 | 26 | 26 | 130 | 130 |
| 3 | Gasoline Isobutanol Vapor Condensate | 10,000 | 26 | 26 | 130 | 130 |
| 4 | Gasoline Isobutanol Vapor Condensate | 20,000 | 26 | 26 | 130 | 130 |

[a] Exposure levels were expressed as $mg/m^3$ of test substance. The exposures were conducted via whole-body inhalation. The Air Control Group 1 was operated under the same conditions as the Group 4 but with exposure to room air only. Otherwise, all exposure chambers were operated under the same conditions with the test substance concentration as the only variable.
[b] Maximum number of pups after culling on Postnatal Day (PND) 4.

## 2.2 Test substance, control article and formulation

### 2.2.1 Test substance

Information supplied by the Sponsor regarding the test substance is contained in the study records. Certificates of Analysis (COA), or equivalent documentation from Chevron Global Technology Services, was provided to the Testing Facility for the test substance for inclusion in the final report Annex 1.

The following information is given in summary:

Test substance: Gasoline Isobutanol Vapor Condensate

Test substance category: Gasoline product

Supplier: Chevron Global Technology Services
100 Chevron Way 51-2126
Richmond, California 94802

Description: Colorless liquid

Storage conditions: Stored in an outside solvent shed, except when being used in the inhalation laboratory.

Batch numbers: Batch 1 (Run 1970) Batch 2 (Run 1972)

Batch 3 ( Run 1973) Batch 5 (Run 1975)

Batch 6 (Run 1976) Batch 7 (Run 1986)

Batch 9 (Run 2022)

Purity analysis: 100% Gasoline isobutanol vapor condensate

Expiration date: Not available, stable per MSDS.

Documentation of the identity, strength, purity, composition, stability, and method of synthesis, fabrication, and/or derivation of the test substance and the maintenance of these records were the responsibility of the Sponsor. There was ~2–3% of isobutanol in the vapor condensate.

A sample from each lot of test substance is stored in the Archives of the Testing Facility under conditions specified for test article storage.

The unused portions of the test substance are maintained by the Testing Facility for use on future studies. Empty test substance containers were returned to the Sponsor's designee on an as-needed basis. The Sponsor is responsible for the final disposition of the test substance containers.

### 2.2.2 Control article

Control article: Room air

### 2.2.3 Preparation of dose formulations

Gasoline Isobutanol Vapor Condensate was used as supplied by the Sponsor.

Detailed records of test substance usage were maintained.

### 2.2.4 Analysis of test substance

Certificates of Analysis (COA), or equivalent documentation from Chevron Global Technology Services, was provided to the Testing Facility for the test substance for inclusion in the final report (Annex 1).

## 2.3 Test article administration

Route Inhalation – whole body.

Controls (Group 1) Air only.

Duration of daily exposure 6 hours.

Details of administration and analysis of the test atmospheres together with the results obtained are presented in Annex 2 and Annex 3.

## 2.4 Animal management

### 2.4.1 $F_0$ animals, allocation and identification

#### Animals

| | | | |
|---|---|---|---|
| Strain/Species | Albino Rats (Outbred) VAF/Plus®<br>CD® (Sprague-Dawley derived) [Crl:CD® (SD)] | | |
| Supplier | Charles River Laboratories<br>Raleigh, North Carolina 27610 | | |
| Number of animals | | Received | Placed on test |
| | Total: | 218 | 208 |
| | Males: | 110 | 104 |
| | Females: | 108 | 104 |
| Pretest period | The pretest period was approximately 2 weeks. All animals were examined during the pretest period to confirm suitability for study. Pretest procedures were not performed until animals had been allowed to stabilize for at least 5 days. | | |
| Age of the $F_0$ study animals at start of treatment | approximately 7 weeks | | |
| Age of the $F_0$ study animals at the start of mating | approximately 16 weeks | | |
| Weight range of the $F_0$ study animals at the start of treatment | Males: | 176 g to 256 g | |
| | Females: | 150 g to 191 g | |

#### Allocation and identification

| | |
|---|---|
| Allocation | More animals than required for the study were purchased and stabilized. Animals were randomly allocated on arrival. Using the sequence of cages in the battery, one animal at a time was placed in each cage with the procedure being repeated until each cage held the appropriate number of animals. Each sex was allocated separately. Individual weights of animals placed on test were within ±20% of the mean weight for each sex. Information as to the disposition of all animals not utilized in the study is maintained in the study file. |

| | |
|---|---|
| Identification of animals | Each $F_0$ rat was identified with a tail tattoo 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. Animals were re-tattooed as necessary. |
| Veterinary care | Animals were monitored by the technical staff for any conditions requiring possible veterinary care and treated as necessary. Miscellaneous, non-test article-related veterinarian evaluations and treatments (as necessary) for individual animals were reviewed by the study director and are documented in the study file. |

### 2.4.2 Husbandry

#### 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 Academies Press, 2011. Envigo, East Millstone, New Jersey is fully accredited by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC).

#### Environmental control

| | |
|---|---|
| Light/dark cycle | A twelve hour light/dark cycle was provided and controlled via an automatic timer. |
| Temperature and relative humidity | Monitored and maintained within the range of 20 to 26 °C and 30 to 70%.<br><br>Although conditions were occasionally outside the indicated ranges, these deviations were minor and/or of short duration and were not considered to have influenced the health of the animals and/or the outcome of the study. |

#### Animal housing and environmental enrichment

| | | |
|---|---|---|
| Cages | Polycarbonate cages with a stainless steel mesh lid. | |
| Number of animals per cage | Pre-mating: | During the pre-mating period, animals were pair- or triple housed. |
| | Mating: | During mating, animals were co-housed one male and one female/cage continuously (except during treatment) until mated or 21 days had elapsed. |

| | |
|---|---|
| | Post-mating: Male animals were pair-housed. Female animals were housed as described in gestation.<br><br>Gestation: Female animals were individually-houses.<br><br>Lactation: During lactation, animals were housed one dam and litter/cage.<br><br>During exposure, animals were individually housed in cages (for approximately 7 hours/day. |
| Bedding | Cellulose-based contact bedding (7070C Teklad Diamond Dry, Harlan Laboratories, Madison, Wisconsin) which was changed at appropriate intervals each week.<br><br>Analytical results of the bedding, provided by the manufacturer, are maintained on file at the Testing Facility. There were no known contaminants in the bedding that were expected to interfere with the objectives of this study. |
| Environmental enrichment | Provided to each cage throughout the study and replaced when necessary. |

**Feed**

| | |
|---|---|
| Diet | Certified Rodent Diet, No. 2016C (pellets) (Harlan Teklad, Madison, WI) *ad libitum.* |
| Availability | Without restriction, except during test substances exposure. Fresh feed was presented weekly. |
| Analysis | Analysis of each feed lot used during this study was performed by the manufacturer. Results were provided to the Testing Facility and are maintained on file at the Testing Facility.There were no known contaminants in the feed that were expected to interfere with the results of this study. |

**Water**

| | |
|---|---|
| Supply | Potable water from the public supply (New Jersey-American Water Company, Cherry Hill, New Jersey) via an automated watering system. |
| Availability | Without restriction except during test substances exposure. |
| Analysis | Water analyses are conducted by New Jersey-American Water Company, Cherry Hill, 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 which were expected to interfere with the results of this study.

## 2.5 Mating, gestation and lactation

### 2.5.1 Estrous cycling

Daily vaginal smears were taken at approximately the same time each day, prior to exposure at 0600-1000, and the stage of estrous was determined for each female for two weeks prior to cohabitation of the $F_0$ females. Evaluations continued during cohabitation until there was evidence of mating or until the 21-day mating period ended. Care was taken to ensure that pseudo-pregnancy was not induced.

### 2.5.2 Mating

After both sexes had been exposed to the test substance for at least 10 weeks (premating treatment period), one $F_0$ male and one $F_0$ female from the same exposure group were caged together until evidence of mating (microscopic observation of sperm in the vaginal smear and/or a copulation plug in the vagina) was observed or for 21 consecutive days. Males and females were not paired during the mating period while being exposed. On the day that evidence of mating was observed, that day was defined as Gestation Day (GD) 0. If mating did not occur during this 21-day interval, the animals were separated without further opportunity for mating.

### 2.5.3 Parturition and lactation

Examination for signs of parturition was made up to three times daily (at least morning and afternoon) beginning on GD 18. Evidence of difficult or prolonged parturition (dystocia), if observed, was recorded. The day on which completion of parturition was observed was defined as LD 0 or LD 1 as per Testing Facility SOPs.

## 2.6 Experimental evaluations ($F_0$)

### 2.6.1 Daily observations

Animals were observed in their cages twice daily for mortality and signs of severe toxic or pharmacologic effects. Animals in extremely poor health or in a possible moribund condition were identified for further monitoring and possible euthanasia.

### 2.6.2 Exposure observations

Observations were made continuously during each inhalation exposure with observations recorded as a group at least once. All animals were within normal limits; this data is not presented but is maintained in the study file.

### 2.6.3 Signs

Animals were removed from their cages and examined at least once pretest, on the first day of treatment and at least weekly during the study period. Gestation observations were conducted on the same day as gestation body weights. Examinations included observations of general condition, skin and fur, eyes, nose, oral cavity, abdomen and external genitalia as well as evaluations of respiration and palpation for tissue masses.

During the exposure period, physical examinations were performed post-exposure.

### 2.6.4 Body weight

Male animals were removed from their cages and weighed at least once during pretest, on the day treatment initiated, weekly throughout the study (including the mating period) and terminally (after fasting). Terminal, fasted body weights were obtained just prior to necropsy.

Female animals were removed from their cages and weighed at least once during pretest as well as on the day treatment initiated, weekly during the premating and mating periods, and on GDs 0, 4, 7, 14 and 21; and on LDs 1, 4, 7, 14, 21 and at termination (fasted) on LD 22. Terminal, fasted body weights were obtained just prior to necropsy.

### 2.6.5 Food consumption

Food consumption was measured (weighed) pretest (the week prior to the initiation of treatment) and weekly during the premating exposure period (food consumption was not measured during the mating period when animals were co-housed). During the post-mating period, males had food consumption measured weekly until euthanasia. Mated females had food consumption measured on GDs 0, 4, 7, 14 and 21 and on LDs 1, 4, 7, 14 and 21.

## 2.7 Litter evaluations ($F_1$)

### 2.7.1 Pup/litter examinations (general appearance and presence of dead pups)

$F_1$ litters were observed as soon as possible after delivery for the number of live and dead pups, sex of the pups and pup abnormalities. Thereafter, litters were observed at least twice daily (morning, afternoon) for the presence of dead pups. Dead pups and pups euthanized in a moribund condition were examined to the extent possible for defects and/or cause of death and preserved in neutral, phosphate-buffered 10% formalin. Litter size was recorded daily from PND 1 to 21.

### 2.7.2 Culling pups

On PND 4, each $F_1$ litter with more than 10 pups was culled to that number with sex distribution equalized (five/sex) when possible. Preferential culling of runts was not performed.

### 2.7.3 Signs

Each $F_1$ pup was given a physical examination on the day of delivery completion and on PND 4, 7, 14 and 21.

### 2.7.4 Individual live pup body weights

Individual $F_1$ pup weights were recorded on PND 1, 4, 7, 14, and 21.

### 2.7.5 Number of pups/sex/litter (external sex determination)

Individual $F_1$ pup sexing data was recorded on PND 1, 4 (pre- and post-cull), 7, 14, and 21.

## 2.8 Postmortem ($F_0$)

### 2.8.1 Method of euthanasia

$F_0$ males: exsanguination following carbon dioxide inhalation.

$F_0$ females: exsanguination following isoflurane inhalation.

### 2.8.2 Scheduled necropsy

$F_0$ male animals were fasted overnight and euthanized after the last pups had been delivered.

All $F_0$ females with litters were euthanized after LD 21. Females that did not litter were euthanized on their presumed GD 25. These females had their uteri stained using ammonium sulfide (modified from Salewski, 1964) to confirm non-pregnant status or evidence of very early implantation loss.

### 2.8.3 Macroscopic examinations

Complete macroscopic examinations were performed on all $F_0$ animals including unscheduled decedents. The macroscopic examination included examination of the external surface and all orifices; the external surfaces of the brain and spinal cord; the organs and tissues of the cranial, thoracic, abdominal and pelvic cavities and neck; and the remainder of the carcass for the presence of macroscopic morphologic abnormalities.

Examination of all parental females included a count of uterine implantation scars.

### 2.8.4 Organ weights

Organs indicated in Text Table 2.8.5-1 were weighed for all $F_0$ animals at the scheduled sacrifice intervals. 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. Except where noted, paired organs were weighed together, as possible.

### 2.8.5 Tissues preserved and examined histopathologically

The tissues listed in Text Table 2.8.5-1 were obtained from 10 $F_0$ animals/sex/group and preserved. In addition, slides of the indicated tissues were prepared and examined microscopically. Any abnormalities not noted during macroscopic examinations which were seen during histology processing were recorded.

**Text Table 2.8.5-1: Tissues weighed, preserved and examined microscopically**

| ORGAN NAME | WEIGHED | PRESERVED | EXAMINED MICROSCOPICALLY Groups 1 and 4 at Terminal Necropsy[a] |
|---|---|---|---|
| Animal identity | | X | |
| Adrenals | X | X | X |
| Brain (including olfactory bulbs) | X | X | |
| Epididymides | X[c] | X[d] | X[d] |
| Kidneys | X | X | |
| Larynx | | X | |
| Liver | X | X | |
| Lungs and bronchi | X | X | X |
| Naso-pharynx/pharynx | | X | |
| Ovaries | X | X | X |
| Pituitary | X | X | X |
| Prostate | X[b] | X | X |
| Seminal vesicles | X[b] | X | X |
| Spleen | X | X | |
| Testes | X[e] | X[d] | X[d] |
| Trachea including tracheal bifurcation w/carina | | X | |
| Uterus (horns/body/cervix) | X | X | X |
| Vagina | | X | X |
| tissues with macroscopic findings including tissue masses | | X | X |

[a]Tissues were examined for study Animals in Groups 2 and 3 which died prior to study termination.
[b]Prostate and seminal vesicle were weighed separately.
[c]Left whole epididymides and right whole and caudal epididymides were weighed separately.
[d]Left only because the right tissues were preserved for sperm assessment.
[e]Left and right testes were weighed separately.

### 2.8.6 Preservatives

All tissues were preserved in 10% neutral buffered formalin (NBF). The testes were placed in Modified Davidson's solution initially and then retained in 10% NBF. Lungs were infused with 10% NBF prior to their immersion into a larger volume of the same fixative.

### 2.8.7 Processing

After fixation, the tissues and organs from all animals were routinely processed, embedded in paraffin, cut at a microtome setting of 4-7 microns, mounted on glass slides, stained with hematoxylin and eosin and examined by light microscopy. The bones were decalcified in Decalcifier II™.

### 2.8.8 Sperm count, morphology and motility assessments

The following sperm evaluations were performed:

Sperm count: The right testis and cauda epididymis of all surviving $F_0$ males were removed intact, weighed fresh, and then frozen at nominal -80°C until evaluation for sperm count (spermatids in the testis).

All $F_0$ males (all groups) were processed for sperm counts. For each of these animals, homogenized samples of the caudal epididymis and the testis were stained and examined using a Hamilton Thorne IVOS sperm analyzer. For each stained preparation, 10 fields were counted. The total number of sperm in the caudal epididymis, or spermatids in the testis, was calculated and reported adjusted for organ weight.

Sperm morphology: Two sperm morphology slides were prepared for each of the surviving $F_0$ males (all groups). These slides were stained with Eosin and Nigrosine. The slides were evaluated for morphological development. (approximately 200 sperm per animal within the 2 slides were assessed).

Sperm motility: From all males (all groups), the right vas deferens was excised and placed in a pre-warmed solution of phosphate buffered saline and 7.5% Bovine Serum Albumin Fraction V in Medium 199. After a "swim-out" period, a sample was placed in a Hamilton Thorne IVOS sperm analyzer and at least 200 sperm and/or five microscope field images were stored electronically.

## 2.9 Postmortem ($F_1$)

All $F_1$ male and females animals were euthanized at PND 21, except for those culled on PND 4.

### 2.9.1 Method of euthanasia

$F_1$ pups PND ≤20 or younger (including culls on PND 4): exsanguination following intraperitoneal injection of sodium pentobarbital

$F_1$ pups PND ≥21: exsanguination following isoflurane inhalation

### 2.9.2 Dead and culled pups

Pups found dead at birth were identified as found dead. Pups found dead during the lactation period were examined to the extent possible for defects and/or the cause of death, and for the presence or absence of milk in the stomach. Dead pups were not eviscerated. Viscera remained intact and the pup was preserved in 10% NBF. Cannibalized pups were examined to the extent possible and discarded.

Culled pups were examined for external abnormalities. If unremarkable, these pups were euthanized and discarded.

### 2.9.3 Macroscopic pathology and tissues preserved

Macroscopic examinations were performed on up to 3 randomly selected pups/sex/litter. Examinations included observations of any structural abnormalities or pathological changes. Special attention was given to the organs of the reproductive system, brain, liver, kidneys, pituitary, adrenal gland, spleen, heart and thymus gland.

All remaining PND 21 $F_1$ pups were examined for external abnormalities and euthanized. Pups with external abnormalities were preserved intact in 10% NBF. Pups with no external abnormalities were discarded. No further macroscopic postmortem examinations were performed.

### 2.9.4 Organ weights

Organs (brain, spleen and thymus) were taken from 1 pup/sex/litter from surviving pups at their scheduled necropsies one PND 21, weighed, recorded and organ/body and organ/brain weight ratios calculated. Organs were not weighed for unscheduled decedents. 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 to avoid drying. Paired organs were weighed together.

## 2.10 Computer systems

The computer systems with version numbers that were used on this study to acquire and quantify data include:

| System | Version | Use |
|---|---|---|
| AmegaView Environmental Monitoring System | 3 | Monitoring of environmental conditions within the pharmacy |
| Hamilton Thorne Computer Assisted Sperm Analyzer | 12.2L | Automated sperm motility analysis and sperm counts |

| System | Version | Use |
|---|---|---|
| Liberate Reporting System | 2.2 | Generation of report tables in MS Word formats for data collected using the Xybion Path/Tox System and ClinAxys II |
| Microsoft Word and/or Excel | | Additional formatting of report tables. |
| Quasar | 1.4 | Statistical analysis of data |
| REES Scientific Environmental Monitoring System | WIN 1.5 | Monitor and record temperature, humidity and/or light intensity readings of applicable rooms as well as the temperature readings of applicable refrigerators and/or freezers |
| TSI Aerodynamic Particle Sizer Spectrometer | 2.9 | Acquisition of particle size data |
| TotalChrom | 6.2.1 | Acquisition and processing of chromatographic data from HPLC |
| Xybion Path/Tox System | 4.2.2 | Direct online capture of in-life and postmortem evaluations |
| Xybion Pristima® System | 7 | Documentation of receipt and tracking of substances received by Pharmacy; direct online capture postmortem evaluations |

## 2.11 Data treatment

Individual animal data presented in this report may be rounded. Unrounded individual animal data were 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.

Group means and standard deviations for calculated data points (i.e., body weight change) were derived from individual animal/cage values.

The data collection system used for collecting the in-life and post-life data divides the study into phases. The start of each phase begins with Day 1/Week 1. The phases presented in this report are:

| | |
|---|---|
| Pretest Phase (PRE): | Begins the day the animals arrive. During this phase, animals are not being dosed and they have not been assigned their permanent identification numbers. |
| Precohabitation Phase (PRC): | Begins the day the first vaginal smears are taken for estrous evaluation (females) and the 1st day of test substance/control article exposure for the males. Test substance/control article administration began on Precohabitation Day 1. |
| Cohabitation Phase (COH): | Begins the day the animals are first paired for mating. |
| Post-mating (PMT): | Begins when co-housing for mating is terminated. |
| Gestation Phase (GES/GD): | Females (dams): begins the day of confirmation of mating. |
| Post-Natal Phase (PND): | Offspring: Begins the day pups are born. |
| Lactation (LAC): | Begins the day delivery was completed. |

The following abbreviations are used in this report:

| | |
|---|---|
| AAALAC | Association for Assessment and Accreditation of Laboratory Animal Care International |
| COA | Certificate of Analysis |
| EMS | error mean square |
| EPA | Environmental Protection Agency |
| GC | Gas chromatography |
| hr(s) | hour(s) |
| IR | infrared |
| LEL | lower explosive limit |
| min(s) | minute(s) |
| M | Male(s) |
| F | Female(s) |
| ~ | approximately |
| $mg/m^3$ | milligrams of test substance per cubic meter |
| NBF | neutral buffered formalin |
| GD | gestation day |
| LD | lactation day |
| PND | postnatal day |

The death codes used have the following meanings:

| | |
|---|---|
| u1 | found dead |
| u4 | humane euthanasia |
| tll | total litter loss |
| ts | terminal sacrifice |

### 2.11.1 Serial observations

#### Clinical observations

Clinical observations are presented for each animal that showed signs, providing detail of the type of sign, day or week of occurrence and information on the duration of the sign applicable.

| | |
|---|---|
| AM | Morning (Pre-dose) Observation |
| PM | Afternoon Observation |

For summarization purposes, descriptive comments [i.e., location of scab(s) and sore(s), etc.] are not presented. These data are contained in the study raw data if needed.

#### Food consumption

Food consumption (g/animal/day) was calculated as:

*grams of food consumed ÷ animal days*[a]

[a]*Sum of whole days each animal is alive in the cage for each consumption period. If an animal dies the day of death is not counted as an animal day. For example: 4 animals in a cage for 5 days equals 20 animal days; if one animal died on the 3rd day then the animal days equals 17.*

### 2.11.2 Terminal procedures

#### Organ weights

Organ weights were presented as absolute, relative to terminal body weight using the weight recorded on the day of necropsy and relative to brain weight.

The following abbreviations were used:

| | |
|---|---|
| Term Bwt | Terminal body weight |
| %Body | Organ to terminal body weight ratio |
| %Brain | Organ to brain weight ratio |

#### Pathology

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

The following abbreviation was used:

| | |
|---|---|
| Histo | Histopathology |

Histopathology findings were graded according to the following scale:

| | |
|---|---|
| Minimal | The change is barely discernible and/or very |

| | |
|---|---|
| | few/very small foci or areas are affected. |
| Slight | The change is more noticeable but only evident as few/small foci or areas affected. |
| Moderate | The change is obviously present, and of appreciable size and/or number. |
| Marked | The change is abundant in many areas of the section and/or is of prominent size. |
| Severe | The change affects a large proportion of the tissue and/or is of a large size. |

### 2.11.3 Statistical analysis

All statistical analyses were carried out separately for males and females. Data relating to food consumption were analyzed on a cage basis. For all other parameters, the analyses were carried out using the individual animal as the basic experimental unit.

The following data types were analyzed at each timepoint separately:

| **$F_0$ Generation** | **$F_1$ Generation** |
|---|---|
| Body weights | Pup survival |
| Body weight changes | $F_1$ Mortality incidence |
| Feed consumption | $F_1$ body weights |
| Gestation length | $F_1$body weight changes |
| Implantations | Organ, organ/body weight and organ/brain ratios |
| Pups Delivered | |
| Organ weights | |
| Estrous evaluations* | |
| Mating and fertility indices* | |
| Corpora lutea | |
| Pre-implantation loss | |
| Sperm counts | |

*Statistical analysis was performed by the Envigo-UK Statistical group.

The parameters to analyze were identified as continuous or discrete. Test-article treated groups were then compared to the control using the following procedures.

#### Continuous parameters

For comparisons involving more than two groups, if Bartlett's test for variance homogeneity (Bartlett, 1937) was not significant at the 1% level, then parametric methods were. If the F1 approximate test for monotonicity (described below) of dose-response was not significant at the 1% level, Williams' test (Williams', 1971, 1972) for a monotonic trend was applied. If the F1 test was significant, suggesting that the dose-response was not monotone, Dunnett's test (Dunnett, 1955, 1964) was performed instead. If Bartlett's test was significant at the 1% level, then logarithmic and square-root transformations were tried. If Bartlett's test was still significant, then non-parametric methods were applied to mean ranks. If the H1 approximate test for monotonicity (described below) was not significant at the 1% level, Shirley's test for a

significant, then non-parametric methods were applied to mean ranks. If the H1 approximate test for monotonicity (described below) was not significant at the 1% level, Shirley's test for a monotonic trend (Shirley, 1977) was applied. If the H1 test was significant, then Steel's test (Steel, 1959) was performed instead.

The F1 test is designed to detect significant departure from monotonicity of an ordered set of means. The test statistic compares the mean square, NMS, for the deviations of the absolute or adjusted means from the maximum likelihood means, calculated under a constraint of monotonicity, with the usual error mean square, EMS. The null hypothesis is that the true means are monotonically ordered. The test statistic is F1 = NMS/EMS which can be compared with standard tables of the F-distribution with 1 and error degrees of freedom.

The H1 test is the non-parametric equivalent of the F1 test. The test statistic compares the non-monotonicity sums of squares, NRSS, for the deviations of the mean ranks from the maximum likelihood mean ranks, with the non-parametric equivalent of the error sums of squares, ERSS=N(N+1)/12. The test statistic is H1 = NRSS/ERSS which can be compared to standard tables of the $\chi$2-distribution with 1 degree of freedom.

### Discrete parameters

For comparisons involving more than two groups, if the Jonckheere-Terpstra test (Jonckheere, 1954) was significant at the 5% level, then the direction of the trend was established and one-tailed step-down testing in this direction was performed. If the Jonckheere-Terpstra test was not significant at the 5% level, then the Kruskal-Wallis test (Kruskal and Wallis, 1952, 1953) was applied. If the Kruskal-Wallis test was significant at the 5% level, the test-article treated groups were compared to the control using exact Wilcoxon rank sum tests (Wilcoxon, 1945), otherwise, no further comparisons were made.

### Statistical annotation

Significant differences between control and treated groups were expressed at the 5% ($p<0.05$) or 1% ($p<0.01$) level. The key to annotations used on the tables that contain statistical results is given below.

| | |
|---|---|
| * | $p<0.05$ |
| ** | $p<0.01$ |

## 2.12 Data storage

All raw data, preserved specimens, 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. The Sponsor will determine the final disposition of these materials. Electronic raw data generated at the Testing Facility are maintained on the computer system on which the data application resides or archived off-line.

## 2.13 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. The particle size samples for Week 2 were not taken because the computer associated with the TSI APS showed a disk boot error which prevented logging onto the system.

2. On Day 42 (PRC 28), the afternoon viability check was not performed.

3. On GD 18, the examination for signs of parturition was not documented for Animal No. 2524.

4. At necropsy, the lungs and bronchi were not weighed for Animal No. 4011.

5. At necropsy, the pituitary gland was not weighed for Animal No. 2504.

6. On Day 36 (PRC 22), the length of exposure was documented on the Test Material Administration Sheet as 361 minutes and on the Chamber Monitoring Records as 360 minutes; therefore, it is not possible to know which length of exposure time is correct.

7. Per the protocol, the Group 1 (air only) exposure level target is 0 $mg/m^3$ and the Study Pre-exposure Checklist for Group 1 indicates an acceptable sampling range of 0-20 $mg/m^3$. However, on the following exposure days the levels were above the acceptable range:

| Exposure Day | Sample No. | Concentration ($mg/m^3$) | Daily Chamber Mean Concentration ($mg/m^{3)}$ |
|---|---|---|---|
| 37 (PRC 23) | 1145 | 30.39 | 7.598 |
| 38 (PRC 24) | 1150 | 26.33 | 7.595 |
| 43 (PRC 29) | 1170 | 20.25 | 7.593 |
| 49 (PRC 35) | 1193 | 30.39 | 7.598 |

8. Documentation that the pups from Dam No. 3522 were uniquely identified by a foot tattoo on the day of delivery completion was not noted on the Dam and Litter Data form. Identification of the pups was performed during litter checks on PND 4 to 21.

9. On Days 47, 50, 51, 64, 67, 71, 72 and 73 (PRCs 33, 36, 37, 50, 53, 57, 58 and 59, respectively), the PM viability checks were performed after 1800 hours.

10. The litter observation data does not indicate that the litters were observed twice daily during the lactation period.

11. At the time that Pup Nos. 1503, 1505, 1508, 1510, 2515, 2518, 2521, 3501, 3512, 3523, 3526, 4510, 4515 and 4518 were euthanized, it is not noted that the animals were exsanguinated following the overdose of sodium pentobarbital via IP injection.

12. At necropsy, gross lesions were examined microscopically from the Groups 2 and 3 animals, and from Animal Nos. 1019 and 4015.

13. The anatomic pathology data was documented on the Xybion Pristima® System data collection system instead of the Xybion Path/Tox data collection system.

14. On the day that the $F_0$ animals arrived, they were not assigned a temporary identification number other than the cage card. Because they were double housed, it was not possible to determine which animal was which until they were tattooed with their permanent identification number.

15. The protocol required that the "…pups (randomly selected 3/sex/litter) will be given a macroscopic examination….". However, the Study Director provided a memo on 28 May 2015 directing the lab to "select the first 3 numerically consecutive pups per sex per litter..." This directive did not provide the protocol-directed randomness for the pup selection.

16. The protocol required that the "The pups (randomly selected 3 pups/sex/litter) will be given a macroscopic examination at euthanasia for any structural abnormalities or pathological changes." However, not all litters provided 3 pups/sex and thus there were occasions where this protocol requirement was not met.

# 3. Results and Discussion

## 3.1 Chamber monitoring results

(Annex 2 and Annex 3)

Gas chromatography analysis (see Annex 2) of the major components in the neat test substance and the test atmospheres showed a reasonably close comparison between the neat test substance and the vaporized test substance. These data demonstrated that the test animals were exposed, as expected, to all of the major components of the test substance in their reasonably proper proportion. The data were consistent from week-to-week during the study indicating stability of the test substance and the atmosphere generation techniques.

Overall target, nominal and achieved (per IR analysis) mean exposure concentrations (see Annex 3) are summarized below:

| Group | Test Substance | Atmosphere Concentration (mg/m$^3$) | | |
|---|---|---|---|---|
| | | Target | Nominal | Achieved |
| 1 | Air Control | 0 | 0 | 0 |
| 2 | Gasoline Isobutanol Vapor Condensate | 2,000 | 2,873 | 2,089 |
| 3 | Gasoline Isobutanol Vapor Condensate | 10,000 | 11,390 | 10,240 |
| 4 | Gasoline Isobutanol Vapor Condensate | 20,000 | 23,290 | 20,410 |

By IR analysis, Group 1 occasionally showed low concentrations of the test substance (mean concentrations ranged from 0.506 to 7.598 mg/m$^{3)}$ however, for the majority of the study no Gasoline Isobutanol Vapor Condensate was detected.

Mean achieved atmosphere concentrations were 4.5%, 2.4% and 2.1% above target for Groups 2, 3 and 4, respectively.

The differences between the nominal and measured concentrations for Groups 2 and 3 may be attributed to the limited sensitivity of the balance used to weigh test substance storage cylinders and the small volume of test substance dispensed during each exposure.

Particle size analysis confirmed the absence of condensation aerosol in all groups during pretest evaluations and throughout the study.

Oxygen levels during animal exposure met protocol requirements of 19% or higher.

All room environmental monitoring for test substance, light and sound were within protocol specifications.

## 3.2 $F_0$ generation data

### 3.2.1 Mortality

(Table 1 and Appendix 1)

There were no test substance-related effects on mortality in the $F_0$ generation males and females.

One 10,000 mg/m$^3$ male (Animal No. 3002) was euthanized on day 39 of the precohabitation period due to hind limb dysfunction (swollen hind paws and an irregular gait). No macroscopic or microscopic findings were observed. This finding was considered to have been due to an accident and was not considered test substance-related. All other males in all groups survived until scheduled termination.

One female (Animal No. 4507) in the 20,000 mg/m$^3$ group was found dead on GD 22. No clinical signs observed in this gravid female prior to death. Discoloration of the lungs was noted at necropsy but no significant microscopic findings were noted in the tissues examined. The death was considered a parturition-related mortality. This finding was not considered test substance-related because the findings were comparable to historical control values and occurred in a single dam.

### 3.2.2 Clinical observations

(Table 2, Table 3, Table 4, Appendix 2, Appendix 3, and Appendix 4)

There were no test substance-related clinical signs.

### 3.2.3 Body weights – premating period

(Table 5, Table 6, Appendix 5 and Appendix 6)

There were no test substance-related effects on body weights.

### 3.2.4 Body weight – mating period

(Table 5, Table 6, Appendix 5 and Appendix 6)

There were no test substance-related effects on body weights.

### 3.2.5 Male body weights – post-mating period

(Table 5, Table 6, Appendix 5 and Appendix 6)

There were no test substance-related effects on body weights.

### 3.2.6 Maternal body weights – gestation and lactation period

(Table 7, Table 8, Table 9, Table 10, Appendix 7, Appendix 8, Appendix 9 and Appendix 10)

There were no test substance-related effects on body weights.

### 3.2.7 Feed consumption – premating period

(Table 11 and Appendix 11)

There were no test substance-related effects on food consumption.

### 3.2.8 Male feed consumption – post-mating period

(Table 11 and Appendix 11)

There were no test substance-related effects on food consumption.

### 3.2.9 Maternal feed consumption – gestation and lactation periods

(Table 12, Table 13, Appendix 12 and Appendix 13)

There were no test substance-related effects on food consumption.

### 3.2.10 Estrous cycle data – premating period

(Table 14, Appendix 14 and Annex 5)

There were no test substance-related effects on mean number of estrous cycles, estrous cycle length, percentage of females cycling and percentage of females with regular estrous cycles.

### 3.2.11 Mating, fertility and gestation indices

(Table 15, Table 16, Appendix 15, Appendix 16 and Annex 5)

There were no test substance-related adverse effects on mating, fertility and gestation indices.

There was a slight reduction (not statistically significant) in fertility in the 20,000 mg/m$^3$ group. The male and female fertility indices in the 20,000 mg/m$^3$ group were slightly reduced (76.9% versus 88.0% in the control groups). The male and female mating and gestation indices were comparable among groups.

There were 25, 25, 25 and 26 females that mated in the 0, 2,000, 10,000 and 20,000 mg/m$^3$ groups. Of these, 22, 22, 23 and 20 were pregnant and 22, 22, 22 and 19 delivered live born pups. There were no pregnant females that delivered all stillborn pups.

### 3.2.12 Parturition and litter survival data

(Table 16, Appendix 16 and Annex 5)

There were no test substance-related adverse effects on parturition and litter survival data.

There were 3, 3, 2 and 0 females with total litter losses in the 0, 2,000, 10,000 and 20,000 mg/m$^3$ groups. This finding was not considered test substance exposure related because the findings were comparable to control values and did not occur in an exposure related manner.

The Gestation Length, mean number pups delivered per litter, Delivery, Live Birth, Viability and Lactation Indices were comparable among groups.

## 3.3 Pup data ($F_1$ generation)

### 3.3.1 Mortality

(Table 16 and Appendix 16)

There were no test substance-related adverse effects on pup mortality.

The percentages for pup mortality were greater in the 2,000 and 10000 mg/m$^3$ groups but decreased in the 20,000 mg/m$^3$ group on PNDs 1 through 4 (12.6, 19.2, 17.9, 4.1% in the respective groups). This finding was not considered test substance-related because the findings were comparable to control values and did not occur in an exposure related manner.

Pup mortality after PND 4 and through to termination on PND 21was comparable among groups.

### 3.3.2 Observations

(Table 17 and Appendix 17)

There were no test substance-related adverse effects on pup clinical observations.

All pup clinical observations were considered to be common for this strain of rat in laboratory conditions, occurred in small incidence, and/or did not occur in a treatment related manner.

### 3.3.3 Body weight data

(Table 18 and Appendix 19)

Pup body weights were significantly increased in the 20,000 mg/m$^3$ group on Postnatal Days 7, 14 and 21, however, this occurrence is most likely due to the control group's body weight being less than the usual body weight values for littering studies and is therefore not considered test substance-related.

## 3.4 Pathology

### 3.4.1 Organ weights ($F_0$ generation)

(Table 21, Appendix 22 and Annex 4)

No test substance-related organ weight changes were present in any terminal sacrifice $F_0$ animals.

### 3.4.2 Unscheduled decedents ($F_0$ generation)

(Annex 4)

One female (Animal No. 4507) was found dead on Gestation Day 22. No clinical signs were observed in this gravid female prior to death. Discoloration of the lungs was noted at necropsy but no significant microscopic findings were noted in the tissues examined. The death was considered a parturition-related mortality. One male (Animal No. 3002) was euthanized for humane reasons on Day 39 due to hind limb dysfunction. No macroscopic or microscopic findings were observed.

### 3.4.3 Macroscopic ($F_0$ generation)

(Table 19, Appendix 20 and Annex 4)

No test substance-related macroscopic findings were noted in any terminal sacrifice animals.

All macroscopic findings occurred sporadically or at similar incidence and severity in control and test article treated groups and were considered incidental and due to biological variability.

### 3.4.4 Microscopic ($F_0$ generation)

(Table 23, Appendix 24, and Annex 4)

No test substance-related microscopic changes were present in any terminal sacrifice animals.

All microscopic findings occurred sporadically or at similar incidence and severity in control and test article treated groups and were considered incidental and due to biological variability.

### 3.4.5 Sperm evaluations ($F_0$ generation)

(Table 24 and Appendix 25)

There were no test substance-related effects on sperm motility (percent motile and progressively motile sperm), testicular and epididymal sperm counts, or sperm morphology (percent normal sperm).

### 3.4.6 Organ weights ($F_1$ generation)

(Table 22 and Appendix 23)

There were no test substance-related adverse effects on pup organ weights.

### 3.4.7 Macroscopic evaluations ($F_1$ generation)

(Table 20)

There were no test substance-related adverse effects on pup macroscopic findings.

All macroscopic findings occurred sporadically or at similar incidence and severity in control and test article treated groups and were considered incidental and due to biological variability.

# 4. Conclusion

Whole-body inhalation exposure to Gasoline Isobutanol Vapor Condensate at 2,000, 10,000 and 20,000 mg/m$^3$ was not associated with any adverse effects on male and female rats and their pups as an evaluation of the integrity and performance of the male and female reproductive systems, including gonadal function, the estrous cycle, mating behavior, conception, gestation, parturition and lactation. This study also provided information about the absence of adverse effects of the test substance on neonatal morbidity and mortality, and data on prenatal and postnatal developmental toxicity.

Under the conditions of this study, the NOAEL (no observable adverse effect level) for Gasoline Isobutanol Vapor Condensate was considered to be 20,000 mg/m$^3$ for reproductive toxicity.

# 5. Calculations

**Female Mating Index (%):**

((Number of females with confirmed mating (sperm and/or vaginal plug) + Number of pregnant females without evidence of mating (no sperm or vaginal plug))/Number of females placed with males) x 100

**Female Fertility Index (%):**

(Number pregnant/Number copulated) x 100

**Male Mating Index (%):**

(Number of males with confirmed mating with a female or pregnancy for females without evidence of mating/Number of males placed with females) x 100

**Male Fertility Index (%):**

(Number impregnating a female/number copulated) x 100

**Gestation Index (%):**

(Number of females with live-born/number of females with confirmed pregnancy) x 100

**Unaccounted for Implantation Sites (%):**

(Number of implantation sites - # pup delivered)/number of implantation sites) x 100

**Delivery Index (%):**

(Number of live pups delivered/number of implantations) x 100

**% Stillborn:**

(Number of stillborn pups/total number of pups delivered) x 100

**Live Birth Index (%):**

(Total number of live-born pups)/total number of pups) born x 100

**Viability Index (%):**

(Number of pups alive Day 4 pre-cull/number of live-born pups) x 100

**Lactation Index (%):**

(Number of pups alive Day 21 (weaning)/number of pups Day 4 post-cull) x 100

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| | Survival and pregnancy – group summary incidence | Table 1 |
|---|---|---|

| Dose Group: | | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| Dose Level (mg/m$^3$): | | 0 | 2,000 | 10,000 | 20,000 |
| Number of males at start | N | 26 | 26 | 26 | 26 |
| Died/sacrificed premating | N | 0 | 0 | 1 | 0 |
| Died/sacrificed postmating | N | 0 | 0 | 0 | 0 |
| Number of females at start | N | 26 | 26 | 26 | 26 |
| Number of females cohabitated | N | 26 | 26 | 26 | 26 |
| Without evidence of mating | N | 1 | 1 | 1 | 0 |
| - Pregnant | N | 22 | 22 | 22 | 19 |
| - Nonpregnant | N | 3 | 3 | 3 | 7 |
| Pregnant | N | 22 | 22 | 22 | 19 |
| Died/sacrificed | N | 0 | 0 | 0 | 0 |
| Died delivering | N | 0 | 0 | 0 | 0 |
| Died/sacrificed post partum | N | 2 | 3 | 2 | 0 |
| Aborted died/sacrificed | N | 0 | 0 | 0 | 0 |
| Nonpregnant | N | 4 | 4 | 3 | 7 |
| Died/sacrificed | N | 0 | 0 | 1 | 1 |
| Total females died/sacrificed | N | 2 | 3 | 3 | 1 |
| | % | 8.0 | 12.0 | 12.0 | 3.8 |
| Dams delivering | N | 22 | 22 | 22 | 19 |
| With liveborn pups | N | 22 | 22 | 22 | 19 |
| | % | 100.0 | 100.0 | 100.0 | 100.0 |
| With all pups stillborn | N | 0 | 0 | 0 | 0 |
| | % | 0.0 | 0.0 | 0.0 | 0.0 |

| Males | Clinical observations during premating, mating and postmating periods - group distribution of observations | Table 2 |
|---|---|---|

| | Phase | PRE | PRC | | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Observations | Group | | | | | | | | | | | | | | | |
| Examined | 1 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| | 2 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| | 3 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| | 4 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| Within Normal Limits | 1 | 26 | 26 | 26 | 26 | 26 | 26 | 25 | 25 | 26 | 25 | 23 | 23 | 24 | 24 | 24 |
| | 2 | 26 | 26 | 25 | 25 | 25 | 25 | 25 | 25 | 24 | 24 | 24 | 23 | 23 | 23 | 23 |
| | 3 | 26 | 26 | 25 | 25 | 25 | 25 | 24 | 24 | 22 | 23 | 23 | 23 | 23 | 23 | 21 |
| | 4 | 26 | 26 | 26 | 26 | 26 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| Behavior/Activity, Irregular Gait | 3 | | | | | | | 1 | | | | | | | | |
| Dermal General, Alopecia (Head/Neck) | 1 | | | | | | | 1 | 1 | | 1 | 2 | 2 | 2 | 2 | 2 |
| | 2 | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 3 | | | | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | 4 | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Dermal General, Alopecia (Limbs) | 3 | | | | | | | | | | | | | | | 1 |
| Dermal General, Alopecia (Torso) | 2 | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Dermal General, Laceration (Limbs/Tail) | 3 | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | |

| Males | Clinical observations during premating, mating and postmating periods - group distribution of observations | Table 2 |
|---|---|---|

| | Phase | PRE | PRC | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Observations | Group | | | | | | | | | | | | | | | |
| Dermal General, Scab(s) | 1 | | | | | | | | | | | 1 | 1 | | | |
| | 3 | | | | | | | | | | | | | | | 1 |
| | 4 | | | | | | | | | 1 | 1 | 1 | | | | |
| General Appearance, Swollen (Limbs/Tail) | 2 | | | | | | | | | | | | 1 | 1 | 1 | 1 |
| | 3 | | | | | | | 1 | | | | | | | | |
| Ocular, Chromodacryorrhea (Unilateral) | 4 | | | | | | 1 | 1 | 1 | | | | | | | |

| Males | Clinical observations during premating, mating and postmating periods - group distribution of observations | Table 2 |
|---|---|---|

| | Phase | PMT | | |
|---|---|---|---|---|
| | Week | 2 | 3 | 4 |
| Observations | Group | | | |
| Examined | 1 | 26 | 26 | 18 |
| | 2 | 26 | 26 | 18 |
| | 3 | 25 | 25 | 18 |
| | 4 | 26 | 26 | 18 |
| Within Normal Limits | 1 | 24 | 23 | 17 |
| | 2 | 23 | 22 | 14 |
| | 3 | 21 | 22 | 16 |
| | 4 | 25 | 25 | 18 |
| Dermal General, Alopecia (Head/Neck) | 1 | 2 | 2 | 1 |
| | 2 | 1 | 2 | 2 |
| | 3 | 2 | 2 | 2 |
| | 4 | 1 | 1 | |
| Dermal General, Alopecia (Limbs) | 1 | | 1 | 1 |
| | 3 | 1 | 1 | |
| Dermal General, Alopecia (Torso) | 2 | 1 | 1 | 1 |
| Dermal General, Scab(s) | 2 | | 1 | 1 |
| | 3 | 1 | | |
| General Appearance, Swollen (Limbs/Tail) | 2 | 1 | 1 | 1 |

| Females | Clinical observations during premating, mating and postmating periods - group distribution of observations | Table 2 |
|---|---|---|

| | Phase | PRE | PRC | | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Observations | Group | | | | | | | | | | | | | | | |
| Examined | 1 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 1 | 1 | |
| | 2 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 1 | 1 | |
| | 3 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 2 | 2 | 1 |
| | 4 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | | | |
| Within Normal Limits | 1 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 25 | 24 | 1 | 1 | |
| | 2 | 26 | 26 | 25 | 25 | 25 | 25 | 25 | 25 | 24 | 24 | 24 | 22 | 1 | 1 | |
| | 3 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 25 | 24 | 2 | 1 | 1 |
| | 4 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 25 | 25 | | | |
| Dermal General, Alopecia (Head/Neck) | 1 | | | | | | | | | | | 1 | 2 | | | |
| | 2 | | | | | | | | | 1 | 1 | 1 | 1 | | | |
| | 3 | | | | | | | | | | | 1 | 2 | | 1 | |
| | 4 | | | | | | | | | | | 1 | 1 | | | |
| Dermal General, Alopecia (Limbs) | 2 | | | | | | | | | | | | 1 | | | |
| Dermal General, Alopecia (Torso) | 2 | | | | | | | | | | | | 1 | | | |
| Oral/Buccal, Incisor(s) Broken/Missing | 2 | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |

| Females | Clinical observations during premating, mating and postmating periods - group distribution of observations | Table 2 |
|---|---|---|

| | Phase | PMT | | |
|---|---|---|---|---|
| | Week | 2 | 3 | 4 |
| Observations | Group | | | |
| Examined | 3 | 1 | 1 | 1 |
| Within Normal Limits | 3 | 1 | 1 | 1 |

| Females | Clinical observations during gestation - group distribution of observations | Table 3 |
|---|---|---|

| | Phase | GES | | | | |
|---|---|---|---|---|---|---|
| | Day | 0 | 4 | 7 | 14 | 21 |
| Observations | Group | | | | | |
| Examined | 1 | 25 | 25 | 25 | 26 | 26 |
| | 2 | 25 | 25 | 25 | 26 | 26 |
| | 3 | 23 | 24 | 24 | 25 | 24 |
| | 4 | 26 | 26 | 26 | 26 | 26 |
| Within Normal Limits | 1 | 23 | 22 | 23 | 24 | 20 |
| | 2 | 21 | 21 | 21 | 21 | 19 |
| | 3 | 21 | 23 | 24 | 22 | 22 |
| | 4 | 26 | 26 | 25 | 25 | 24 |
| Dermal General, Alopecia (Head/Neck) | 1 | 2 | 2 | 1 | 1 | 1 |
| | 2 | 1 | 1 | 1 | 1 | |
| | 3 | 2 | 1 | | 1 | |
| Dermal General, Alopecia (Limbs) | 1 | | 1 | 1 | 1 | 4 |
| | 2 | 1 | 1 | 1 | 2 | 3 |
| | 3 | | | | 2 | 2 |
| | 4 | | | 1 | 1 | 1 |
| Dermal General, Alopecia (Torso) | 2 | 1 | 1 | 1 | 1 | 2 |
| | 4 | | | | | 1 |
| Dermal General, Stains on Fur (Head/Neck) | 1 | | | | | 1 |
| | 2 | | | | | 1 |

| Females | Clinical observations during gestation - group distribution of observations | Table 3 |
|---|---|---|

| | Phase | GES | | | | |
|---|---|---|---|---|---|---|
| | Day | 0 | 4 | 7 | 14 | 21 |
| Observations | Group | | | | | |
| General Appearance, Red Exudate (Head/Neck) | 1 | | | | | 1 |
| General Appearance, Red Exudate (Limbs/Tail) | 1 | | | | | 1 |
| | 2 | | | | | 1 |
| | 3 | | | | | 1 |
| General Appearance, Swollen (Limbs/Tail) | 1 | | | 1 | 1 | |
| Oral/Buccal, Incisor(s) Broken/Missing | 2 | 1 | 1 | 1 | 1 | 1 |

| Females | Clinical observations during lactation - group distribution of observations | Table 4 |
|---|---|---|

| | Phase | LAC | | | | |
|---|---|---|---|---|---|---|
| | Day | 1 | 4 | 7 | 14 | 21 |
| Observations | Group | | | | | |
| Examined | 1 | 22 | 20 | 20 | 20 | 19 |
| | 2 | 22 | 19 | 19 | 19 | 19 |
| | 3 | 22 | 20 | 20 | 20 | 20 |
| | 4 | 19 | 19 | 19 | 19 | 19 |
| Within Normal Limits | 1 | 15 | 14 | 13 | 13 | 13 |
| | 2 | 17 | 14 | 14 | 14 | 14 |
| | 3 | 18 | 17 | 17 | 17 | 17 |
| | 4 | 16 | 16 | 14 | 14 | 14 |
| Dermal General, Alopecia (Head/Neck) | 1 | 1 | 1 | 1 | 1 | 1 |
| | 3 | 1 | 1 | 1 | 1 | 1 |
| Dermal General, Alopecia (Limbs) | 1 | 5 | 5 | 5 | 5 | 4 |
| | 2 | 3 | 3 | 3 | 3 | 3 |
| | 3 | 2 | 2 | 2 | 2 | 2 |
| | 4 | 2 | 2 | 4 | 4 | 4 |
| Dermal General, Alopecia (Torso) | 2 | 1 | 1 | 1 | 1 | 1 |
| | 3 | | | 1 | 1 | 1 |
| | 4 | 1 | 1 | 1 | 1 | 1 |
| Dermal General, Ano-Genital Staining | 3 | 1 | | | | |

| Females | Clinical observations during lactation - group distribution of observations | Table 4 |
|---|---|---|

| | | Phase | LAC | | | | |
|---|---|---|---|---|---|---|---|
| | | Day | 1 | 4 | 7 | 14 | 21 |
| Observations | Group | | | | | | |
| Dermal General, Stains on Fur (Head/Neck) | 1 | | 1 | 1 | | | |
| General Appearance, Red Exudate (Head/Neck) | 1 | | 1 | | | | |
| General Appearance, Red Exudate (Limbs/Tail) | 1 | | 1 | | | | |
| | 2 | | 1 | | | | |
| | 3 | | 1 | | | | |
| Ocular, Chromodacryorrhea (Unilateral) | 1 | | | | 1 | 1 | 1 |
| Oral/Buccal, Incisor(s) Broken/Missing | 2 | | 1 | 1 | 1 | 1 | 1 |

| Males | Body weight during premating, mating and postmating periods - group mean values (grams) | Table 5 |
|---|---|---|

| Phase | PRE | PRC | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | |
| Mean | 168.7 | 211.5 | 271.3 | 327.4 | 372.7 | 412.1 | 444.1 | 470.1 | 491.5 | 513.0 | 525.6 | 541.9 |
| SD | 13.61 | 16.00 | 20.21 | 25.78 | 29.39 | 32.63 | 35.26 | 37.99 | 40.12 | 42.19 | 43.01 | 44.50 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | |
| Mean | 165.7 | 208.1 | 266.4 | 322.7 | 368.4 | 404.5 | 434.8 | 457.2 | 481.5 | 502.2 | 518.5 | 528.6 |
| SD | 11.58 | 15.03 | 21.45 | 27.23 | 32.29 | 35.56 | 37.61 | 39.53 | 46.14 | 47.10 | 46.39 | 50.74 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | |
| Mean | 168.7 | 211.5 | 272.6 | 326.8 | 370.8 | 408.8 | 437.7 | 465.4 | 487.7 | 508.9 | 527.7 | 539.3 |
| SD | 9.93 | 13.84 | 20.54 | 27.09 | 32.93 | 38.64 | 43.34 | 46.05 | 45.00 | 51.68 | 54.48 | 54.58 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 25 | 25 | 25 | 25 | 25 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | |
| Mean | 169.8 | 213.2 | 275.8 | 330.6 | 373.5 | 413.2 | 441.1 | 468.1 | 492.9 | 514.9 | 531.8 | 543.2 |
| SD | 13.02 | 17.14 | 23.37 | 30.42 | 35.35 | 40.97 | 41.33 | 45.47 | 46.94 | 52.63 | 53.46 | 56.91 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |

No statistically significant differences from control mean

| Males | Body weight during premating, mating and postmating periods - group mean values (grams) | Table 5 |
|---|---|---|

| Phase | COH | | PMT | | | |
|---|---|---|---|---|---|---|
| Week | 1 | 2 | 1 | 2 | 3 | 4 |
| Group 1 - 0 mg/m$^3$ | | | | | | |
| Mean | 558.4 | 572.3 | 578.7 | 585.8 | 595.9 | 612.3 |
| SD | 44.64 | 45.04 | 46.64 | 49.32 | 49.74 | 58.73 |
| N | 26 | 26 | 26 | 26 | 26 | 18 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | |
| Mean | 547.9 | 561.4 | 567.1 | 571.4 | 586.9 | 605.9 |
| SD | 51.98 | 54.73 | 52.45 | 57.43 | 59.70 | 64.32 |
| N | 26 | 26 | 26 | 26 | 26 | 18 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | |
| Mean | 555.8 | 569.9 | 577.8 | 586.9 | 594.8 | 623.2 |
| SD | 56.26 | 59.53 | 62.43 | 60.57 | 67.64 | 72.98 |
| N | 25 | 25 | 25 | 25 | 25 | 18 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | |
| Mean | 562.8 | 574.8 | 583.3 | 586.6 | 597.5 | 628.0 |
| SD | 57.33 | 59.09 | 61.49 | 64.72 | 66.85 | 76.95 |
| N | 26 | 26 | 26 | 26 | 26 | 18 |

No statistically significant differences from control mean

| Females | Body weight during premating, mating and postmating periods - group mean values (grams) | Table 5 |
|---|---|---|

| Phase | PRE | PRC | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | |
| Mean | 152.3 | 170.9 | 195.4 | 215.5 | 233.0 | 245.1 | 253.9 | 262.6 | 269.9 | 276.9 | 277.9 | 280.5 |
| SD | 6.58 | 7.06 | 8.81 | 10.94 | 12.64 | 13.76 | 15.27 | 17.18 | 18.10 | 18.79 | 19.01 | 19.07 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | |
| Mean | 150.7 | 170.5 | 195.1 | 215.2 | 234.0 | 246.5 | 257.4 | 262.4 | 270.1 | 276.1 | 280.3 | 281.5 |
| SD | 7.16 | 9.50 | 11.49 | 13.06 | 14.23 | 16.06 | 17.99 | 17.17 | 16.77 | 17.82 | 18.44 | 16.79 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | |
| Mean | 150.5 | 169.1 | 195.6 | 214.6 | 231.2 | 244.7 | 254.6 | 259.8 | 270.4 | 276.8 | 280.8 | 281.2 |
| SD | 9.24 | 10.91 | 14.31 | 17.08 | 19.77 | 21.36 | 22.15 | 23.32 | 23.97 | 24.64 | 25.85 | 26.63 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | |
| Mean | 149.9 | 169.1 | 195.5 | 213.7 | 230.1 | 244.0 | 252.5 | 260.6 | 267.7 | 273.7 | 279.4 | 280.0 |
| SD | 9.13 | 10.37 | 12.38 | 13.39 | 14.82 | 15.83 | 17.03 | 17.59 | 17.20 | 17.15 | 19.23 | 18.76 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |

No statistically significant differences from control mean

| Females | Body weight during premating, mating and postmating periods - group mean values (grams) | Table 5 |
|---|---|---|

| Phase | COH | | PMT | | | |
|---|---|---|---|---|---|---|
| Week | 1 | 2 | 1 | 2 | 3 | 4 |
| Group 1 - 0 mg/m$^3$ | | | | | | |
| Mean | 339.1 | 353.1 | | | | |
| SD | | | | | | |
| N | 1 | 1 | | | | |
| Group 2 - 2,000 mg/m$^3$ | | | | | | |
| Mean | 330.6 | 350.2 | | | | |
| SD | | | | | | |
| N | 1 | 1 | | | | |
| Group 3 - 10,000 mg/m$^3$ | | | | | | |
| Mean | 296.3 | 304.9 | 313.2 | 311.4 | 314.9 | 318.7 |
| SD | 16.26 | 11.46 | | | | |
| N | 2 | 2 | 1 | 1 | 1 | 1 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | |
| Mean | | | | | | |
| SD | | | | | | |
| N | | | | | | |

| Males | Body weight change during premating, mating and postmating periods - group mean values (grams) | Table 6 |
|---|---|---|

| Phase | PRE-PRC | PRC | | | | | | | | | | PRC-COH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Week | 2-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-1 |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | |
| Mean | 42.8 | 59.7 | 56.1 | 45.3 | 39.4 | 32.0 | 26.0 | 21.4 | 21.5 | 12.6 | 16.3 | 16.5 |
| SD | 4.65 | 6.19 | 8.42 | 7.37 | 6.87 | 6.56 | 4.75 | 5.88 | 4.83 | 5.86 | 4.36 | 7.77 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | |
| Mean | 42.4 | 58.3 | 56.3 | 45.7 | 36.0 | 30.3 | 22.5 | 24.2 | 20.7 | 16.4* | 10.0* | 19.3 |
| SD | 4.94 | 8.06 | 7.98 | 8.15 | 5.27 | 5.55 | 9.93 | 12.04 | 6.29 | 6.89 | 11.53 | 11.03 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | |
| Mean | 42.9 | 61.1 | 54.2 | 44.1 | 38.0 | 28.9 | 25.3 | 22.3 | 21.2 | 18.9** | 11.5* | 16.5 |
| SD | 6.05 | 8.59 | 8.42 | 7.35 | 8.26 | 13.66 | 5.76 | 12.03 | 12.72 | 4.60 | 6.85 | 9.20 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 25 | 25 | 25 | 25 | 25 | 25 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | |
| Mean | 43.4 | 62.6 | 54.8 | 42.9 | 39.7 | 27.9* | 27.0 | 24.8* | 22.0 | 16.9** | 11.5** | 19.6 |
| SD | 5.72 | 8.17 | 9.03 | 6.46 | 8.02 | 7.41 | 7.92 | 5.83 | 12.92 | 7.13 | 9.86 | 9.98 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |

* = $p < 0.05$, ** = $p < 0.01$

| Males | Body weight change during premating, mating and postmating periods - group mean values (grams) | Table 6 |
|---|---|---|

| Phase | COH | COH-PMT | PMT | | |
|---|---|---|---|---|---|
| Week | 1-2 | 2-1 | 1-2 | 2-3 | 3-4 |
| Group 1 - 0 mg/m$^3$ | | | | | |
| Mean | 13.9 | 6.5 | 7.0 | 10.1 | 13.1 |
| SD | 5.57 | 5.30 | 8.57 | 6.81 | 7.43 |
| N | 26 | 26 | 26 | 26 | 18 |
| Group 2 - 2,000 mg/m$^3$ | | | | | |
| Mean | 13.5 | 5.7 | 4.3 | 15.6 | 14.2 |
| SD | 7.13 | 9.58 | 30.08 | 27.92 | 7.74 |
| N | 26 | 26 | 26 | 26 | 18 |
| Group 3 - 10,000 mg/m$^3$ | | | | | |
| Mean | 14.1 | 7.9 | 9.1 | 7.9 | 13.1 |
| SD | 7.33 | 8.16 | 27.78 | 30.68 | 6.29 |
| N | 25 | 25 | 25 | 25 | 18 |
| Group 4 - 20,000 mg/m$^3$ | | | | | |
| Mean | 11.9 | 8.5 | 3.4 | 10.9 | 17.3 |
| SD | 6.72 | 9.89 | 11.87 | 7.88 | 6.18 |
| N | 26 | 26 | 26 | 26 | 18 |

No statistically significant differences from control mean

| Females | Body weight change during premating, mating and postmating periods - group mean values (grams) | Table 6 |
|---|---|---|

| Phase | PRE-PRC | PRC | | | | | | | | | | PRC-COH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Week | 2-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-1 |
| Group 1 - 0 mg/m$^3$/day | | | | | | | | | | | | |
| Mean | 18.6 | 24.5 | 20.1 | 17.5 | 12.1 | 8.8 | 8.7 | 7.3 | 7.0 | 1.1 | 2.6 | 17.7 |
| SD | 2.42 | 4.61 | 3.85 | 3.61 | 3.97 | 3.64 | 4.37 | 3.76 | 5.28 | 4.16 | 3.63 | |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 1 |
| Group 2 - 2,000 mg/m$^3$/day | | | | | | | | | | | | |
| Mean | 19.8 | 24.6 | 20.1 | 18.8 | 12.5 | 10.9 | 5.0* | 7.7 | 6.0 | 4.2* | 1.2 | 35.2 |
| SD | 3.20 | 3.83 | 3.61 | 4.70 | 4.49 | 4.64 | 4.59 | 3.95 | 6.44 | 3.96 | 3.76 | |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 1 |
| Group 3 - 10,000 mg/m$^3$/day | | | | | | | | | | | | |
| Mean | 18.6 | 26.6 | 18.9 | 16.7 | 13.5 | 9.9 | 5.2* | 10.5** | 6.4 | 4.0* | 0.3 | 17.6 |
| SD | 3.79 | 4.94 | 10.49 | 12.48 | 4.07 | 3.97 | 4.44 | 3.83 | 4.97 | 5.83 | 5.95 | 4.60 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 2 |
| Group 4 - 20,000 mg/m$^3$/day | | | | | | | | | | | | |
| Mean | 19.2 | 26.4 | 18.2 | 16.4 | 13.9 | 8.5 | 8.1 | 7.0 | 6.0 | 5.7** | 0.6 | |
| SD | 4.05 | 6.03 | 3.80 | 3.92 | 4.70 | 4.52 | 5.16 | 3.82 | 4.07 | 4.81 | 4.28 | |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | |

* = $p < 0.05$, ** = $p < 0.01$

| Females | Body weight change during premating, mating and postmating periods - group mean values (grams) | Table 6 |
|---|---|---|

| Phase | COH | COH-PMT | PMT | | |
|---|---|---|---|---|---|
| Week | 1-2 | 2-1 | 1-2 | 2-3 | 3-4 |
| Group 1 - 0 mg/m$^3$/day | | | | | |
| Mean | 14.0 | | | | |
| SD | | | | | |
| N | 1 | | | | |
| Group 2 - 2,000 mg/m$^3$/day | | | | | |
| Mean | 19.6 | | | | |
| SD | | | | | |
| N | 1 | | | | |
| Group 3 - 10,000 mg/m$^3$/day | | | | | |
| Mean | 8.6 | 0.2 | -1.8 | 3.5 | 3.8 |
| SD | 4.81 | | | | |
| N | 2 | 1 | 1 | 1 | 1 |
| Group 4 - 20,000 mg/m$^3$/day | | | | | |
| Mean | | | | | |
| SD | | | | | |
| N | | | | | |

| Females | Body weight during gestation - group mean values (grams) | Table 7 |
|---|---|---|

| Phase | GES | | | | |
|---|---|---|---|---|---|
| Day | 0 | 4 | 7 | 14 | 21 |
| Group 1 - 0 mg/m$^3$ | | | | | |
| Mean | 286.3 | 301.4 | 310.9 | 342.4 | 404.6 |
| SD | 18.35 | 19.51 | 19.53 | 20.25 | 24.16 |
| N | 22 | 22 | 22 | 22 | 22 |
| Group 2 - 2,000 mg/m$^3$ | | | | | |
| Mean | 286.1 | 300.3 | 305.9 | 336.3 | 397.3 |
| SD | 18.70 | 21.73 | 22.36 | 25.99 | 29.14 |
| N | 21 | 21 | 21 | 22 | 22 |
| Group 3 - 10,000 mg/m$^3$ | | | | | |
| Mean | 291.6 | 310.6 | 318.9 | 347.3 | 414.1 |
| SD | 28.63 | 30.78 | 33.24 | 36.03 | 41.81 |
| N | 21 | 21 | 21 | 22 | 21 |
| Group 4 - 20,000 mg/m$^3$ | | | | | |
| Mean | 284.1 | 301.0 | 309.1 | 337.0 | 399.5 |
| SD | 18.11 | 19.63 | 20.17 | 20.52 | 32.05 |
| N | 20 | 20 | 20 | 20 | 20 |

No statistically significant differences from control mean

| Females | Body weight change during gestation - group mean values (grams) | Table 8 |
|---|---|---|

| Phase | GES | | | |
|---|---|---|---|---|
| Day | 0-4 | 4-7 | 7-14 | 14-21 |
| Group 1 - 0 mg/m$^3$ | | | | |
| Mean | 15.1 | 9.5 | 31.5 | 62.2 |
| SD | 5.10 | 3.86 | 5.08 | 13.30 |
| N | 22 | 22 | 22 | 22 |
| Group 2 - 2,000 mg/m$^3$ | | | | |
| Mean | 14.2 | 5.7 | 29.5 | 61.0 |
| SD | 6.41 | 5.04 | 5.77 | 12.01 |
| N | 21 | 21 | 21 | 22 |
| Group 3 - 10,000 mg/m$^3$ | | | | |
| Mean | 19.1 | 8.3 | 29.9 | 65.3 |
| SD | 4.74 | 5.85 | 6.36 | 9.45 |
| N | 21 | 21 | 21 | 21 |
| Group 4 - 20,000 mg/m$^3$ | | | | |
| Mean | 17.0 | 8.1 | 27.8* | 62.5 |
| SD | 4.80 | 4.10 | 5.14 | 24.35 |
| N | 20 | 20 | 20 | 20 |

* = $p < 0.05$

| Females | Body weight during lactation - group mean values (grams) | Table 9 |
|---|---|---|

| Phase | LAC | | | | |
|---|---|---|---|---|---|
| Day | 1 | 4 | 7 | 14 | 21 |
| Group 1 - 0 mg/m$^3$/day | | | | | |
| Mean | 283.6 | 306.5 | 291.4 | 300.7 | 308.6 |
| SD | 19.19 | 23.59 | 17.41 | 15.10 | 16.12 |
| N | 22 | 20 | 20 | 20 | 19 |
| Group 2 - 2,000 mg/m$^3$/day | | | | | |
| Mean | 278.3 | 305.0 | 291.6 | 300.8 | 310.4 |
| SD | 23.18 | 21.02 | 21.46 | 17.13 | 22.67 |
| N | 22 | 19 | 19 | 19 | 19 |
| Group 3 - 10,000 mg/m$^3$/day | | | | | |
| Mean | 293.0 | 314.0 | 300.1 | 312.9 | 321.7 |
| SD | 34.42 | 33.20 | 26.90 | 27.49 | 25.75 |
| N | 22 | 20 | 20 | 20 | 20 |
| Group 4 - 20,000 mg/m$^3$/day | | | | | |
| Mean | 285.6 | 302.8 | 298.8 | 302.5 | 310.9 |
| SD | 17.32 | 20.07 | 18.74 | 18.02 | 12.72 |
| N | 19 | 19 | 19 | 19 | 19 |

No statistically significant differences from control mean

| Females | Body weight change during lactation - group mean values (grams) | Table 10 |
|---|---|---|

| Phase | LAC | | | |
|---|---|---|---|---|
| Day | 1-4 | 4-7 | 7-14 | 14-21 |
| Group 1 - 0 mg/m$^3$ | | | | |
| Mean | 22.8 | -15.0 | 9.2 | 7.7 |
| SD | 14.17 | 13.80 | 10.90 | 11.88 |
| N | 20 | 20 | 20 | 19 |
| Group 2 - 2,000 mg/m$^3$ | | | | |
| Mean | 24.0 | -13.4 | 9.2 | 9.6 |
| SD | 14.61 | 15.42 | 10.51 | 10.51 |
| N | 19 | 19 | 19 | 19 |
| Group 3 - 10,000 mg/m$^3$ | | | | |
| Mean | 15.6 | -13.9 | 12.8 | 8.8 |
| SD | 12.26 | 12.14 | 10.22 | 10.23 |
| N | 20 | 20 | 20 | 20 |
| Group 4 - 20,000 mg/m$^3$ | | | | |
| Mean | 17.1 | -4.0** | 3.8 | 8.4 |
| SD | 10.82 | 8.62 | 10.27 | 12.01 |
| N | 19 | 19 | 19 | 19 |

** = $p < 0.01$

| Males | Food consumption during premating and postmating periods - group mean values (grams/animal/day) | Table 11 |
|---|---|---|

| Phase | PRE | PRC | | | | | | | | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Week | 1-2 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 1-2 |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | |
| Mean | 24.6 | 26.8 | 27.3 | 28.4 | 29.4 | 30.4 | 29.8 | 28.6 | 28.4 | 27.5 | 28.8 | 27.1 |
| SD | 1.02 | 0.99 | 1.42 | 1.82 | 1.75 | 1.34 | 1.48 | 1.43 | 1.47 | 1.10 | 1.90 | 1.52 |
| N | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 12 | 13 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | |
| Mean | 23.9 | 27.2 | 27.8 | 28.5 | 29.4 | 30.0 | 28.9 | 28.6 | 28.2 | 28.1 | 29.1 | 27.4 |
| SD | 1.62 | 1.97 | 1.61 | 2.01 | 2.09 | 1.81 | 1.82 | 2.84 | 2.15 | 1.69 | 2.16 | 1.97 |
| N | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | |
| Mean | 24.0 | 27.6 | 27.2 | 28.2 | 29.4 | 29.6 | 28.9 | 28.9 | 28.4 | 28.4 | 29.1 | 27.3 |
| SD | 1.59 | 2.22 | 2.22 | 2.14 | 2.44 | 2.78 | 1.84 | 2.22 | 2.77 | 2.35 | 2.57 | 2.76 |
| N | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | |
| Mean | 24.5 | 27.4 | 27.9 | 28.5 | 30.2 | 30.3 | 30.1 | 30.1 | 29.9 | 29.7* | 29.4 | 27.5 |
| SD | 1.85 | 2.03 | 2.68 | 2.70 | 2.74 | 2.16 | 2.78 | 2.19 | 3.67 | 2.86 | 3.00 | 3.04 |
| N | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |

* = $p < 0.05$

| Males | Food consumption during premating and postmating periods - group mean values (grams/animal/day) | Table 11 |
|---|---|---|

| Phase | PMT | |
|---|---|---|
| Week | 2-3 | 3 |
| Group 1 - 0 mg/m$^3$ | | |
| Mean | 26.9 | 28.7 |
| SD | 1.38 | 1.80 |
| N | 13 | 13 |
| Group 2 - 2,000 mg/m$^3$ | | |
| Mean | 27.3 | 29.0 |
| SD | 2.22 | 2.39 |
| N | 13 | 13 |
| Group 3 - 10,000 mg/m$^3$ | | |
| Mean | 27.9 | 29.2 |
| SD | 2.54 | 2.94 |
| N | 13 | 13 |
| Group 4 - 20,000 mg/m$^3$ | | |
| Mean | 28.3 | 29.5 |
| SD | 2.82 | 3.24 |
| N | 13 | 13 |

No statistically significant differences from control mean

| Females | Food consumption during premating and postmating periods - group mean values (grams/animal/day) | Table 11 |
|---|---|---|

| Phase | PRE | PRC | | | | | | | | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Week | 1-2 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 1-2 |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | |
| Mean | 17.6 | 18.6 | 18.6 | 19.4 | 19.5 | 19.5 | 19.5 | 18.8 | 18.3 | 17.4 | 17.7 | |
| SD | 0.67 | 1.00 | 1.23 | 1.27 | 1.10 | 1.67 | 1.41 | 1.21 | 1.32 | 1.22 | 1.35 | |
| N | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | |
| Mean | 17.4 | 19.1 | 19.2 | 20.1 | 20.3 | 20.2 | 19.4 | 19.8 | 19.4 | 18.0 | 18.5 | |
| SD | 0.85 | 0.86 | 0.90 | 1.28 | 0.88 | 1.19 | 1.09 | 1.41 | 2.28 | 1.30 | 1.63 | |
| N | 13 | 13 | 13 | 13 | 13 | 12 | 13 | 13 | 13 | 13 | 13 | |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | |
| Mean | 16.8 | 18.6 | 18.3 | 19.0 | 20.0 | 19.5 | 19.0 | 19.2 | 18.6 | 18.2 | 17.6 | 15.9 |
| SD | 1.01 | 1.40 | 1.35 | 1.51 | 2.55 | 1.52 | 1.54 | 1.49 | 1.50 | 1.30 | 1.40 | |
| N | 13 | 13 | 13 | 12 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 1 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | |
| Mean | 17.0 | 18.3 | 18.2 | 19.1 | 19.5 | 20.3 | 18.7 | 19.2 | 18.7 | 18.5* | 17.6 | |
| SD | 1.01 | 0.98 | 0.90 | 0.94 | 1.08 | 0.82 | 1.00 | 0.90 | 0.91 | 1.07 | 0.94 | |
| N | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | |

* = $p < 0.05$

| Females | Food consumption during premating and postmating periods - group mean values (grams/animal/day) | Table 11 |
|---|---|---|

| Phase | PMT | |
|---|---|---|
| Week | 2-3 | 3-4 |
| Group 1 - 0 mg/m$^3$ | | |
| Mean | | |
| SD | | |
| N | | |
| Group 2 - 2,000 mg/m$^3$ | | |
| Mean | | |
| SD | | |
| N | | |
| Group 3 - 10,000 mg/m$^3$ | | |
| Mean | 18.4 | 19.1 |
| SD | | |
| N | 1 | 1 |
| Group 4 - 20,000 mg/m$^3$ | | |
| Mean | | |
| SD | | |
| N | | |

| Females | Food consumption during gestation - group mean values (grams/animal/day) | Table 12 |
|---|---|---|

| Phase | GES | | | |
|---|---|---|---|---|
| Day | 0-4 | 4-7 | 7-14 | 14-21 |
| Group 1 - 0 mg/m$^3$ | | | | |
| Mean | 21.3 | 22.5 | 24.4 | 21.6 |
| SD | 2.13 | 2.58 | 2.18 | 2.32 |
| N | 22 | 22 | 22 | 22 |
| Group 2 - 2,000 mg/m$^3$ | | | | |
| Mean | 20.6 | 21.8 | 23.5 | 21.7 |
| SD | 2.34 | 3.04 | 2.41 | 1.87 |
| N | 21 | 21 | 21 | 22 |
| Group 3 - 10,000 mg/m$^3$ | | | | |
| Mean | 22.4 | 23.7 | 24.7 | 23.4 |
| SD | 3.09 | 3.48 | 3.46 | 3.49 |
| N | 21 | 21 | 21 | 21 |
| Group 4 - 20,000 mg/m$^3$ | | | | |
| Mean | 21.6 | 23.0 | 23.3 | 22.1 |
| SD | 2.01 | 2.45 | 1.98 | 2.09 |
| N | 20 | 20 | 20 | 20 |

No statistically significant differences from control mean

| Females | Food consumption during lactation - group mean values (grams/animal/day) | Table 13 |
|---|---|---|

| Phase | LAC | | | |
|---|---|---|---|---|
| Day | 1-4 | 4-7 | 7-14 | 14-21 |
| Group 1 - 0 mg/m$^3$ | | | | |
| Mean | 26.3 | 32.3 | 43.4 | 56.7 |
| SD | 6.77 | 6.10 | 6.13 | 8.35 |
| N | 20 | 20 | 20 | 19 |
| Group 2 - 2,000 mg/m$^3$ | | | | |
| Mean | 25.6 | 33.9 | 48.3 | 58.5 |
| SD | 4.56 | 5.53 | 6.94 | 5.46 |
| N | 19 | 19 | 19 | 19 |
| Group 3 - 10,000 mg/m$^3$ | | | | |
| Mean | 25.9 | 30.8 | 43.8 | 55.8 |
| SD | 8.00 | 4.85 | 8.38 | 11.09 |
| N | 20 | 20 | 19 | 20 |
| Group 4 - 20,000 mg/m$^3$ | | | | |
| Mean | 26.9 | 35.5 | 47.2 | 60.3 |
| SD | 4.37 | 4.45 | 4.53 | 6.01 |
| N | 19 | 19 | 19 | 19 |

No statistically significant differences from control mean

| | Estrous stages – group mean values | Table 14 |
|---|---|---|

Pre-mating/mating

| Number of Animals | Regular Cycles 4 day | 4/5 day | 5 day | Total | Irregular cycle λ | Extended estrus ϕ | Acyclic Ψ | | Number of Cycles | Mean Cycle Length (Days) |
|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 – 0 mg/m$^3$ | | | | | | | | | | |
| 26 | 9 | 4 | 1 | 14 | 12 | 0 | 0 | Mean | 3.3 | 4.5 |
| | 35% | 15% | 4% | 54% | 46% | 0% | 0% | SD | 0.74 | 0.81 |
| Group 2 – 2,000 mg/m$^3$ | | | | | | | | | | |
| 26 | 11 | 2 | 0 | 13 | 12 | 1 | 0 | Mean | 3.3 | 4.3 |
| | 42% | 8% | 0% | 50% | 46% | 4% | 0% | SD | 0.62 | 0.71 |
| Group 3 – 10,000 mg/m$^3$ | | | | | | | | | | |
| 26 | 12 | 2 | 0 | 14 | 12 | 0 | 0 | Mean | 3.5 | 4.5 |
| | 46% | 8% | 0% | 54% | 46% | 0% | 0% | SD | 0.99 | 0.91 |
| Group 4 – 20,000 mg/m$^3$ | | | | | | | | | | |
| 26 | 13 | 1 | 1 | 15 | 9 | 2 | 0 | Mean | 3.4 | 4.6 |
| | 50% | 4% | 4% | 58% | 35% | 8% | 0% | SD | 0.85 | 2.19 |

λ At least one cycle of <4 or >5 days
ϕ At least four consecutive days of estrus
Ψ At least ten days without estrus

| | Cohabitation data - group summary incidence | Table 15 |
|---|---|---|

| Dose Group: | | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| Dose Level (mg/m$^3$): | | 0 | 2,000 | 10,000 | 20,000 |
| Females paired with males | N | 26 | 26 | 26 | 26 |
| Total number mated | N | 25 | 25 | 25 | 26 |
| female mating index | % | 96.2 | 96.2 | 96.2 | 100.0 |
| Total number pregnant | N | 22 | 22 | 22 | 19 |
| female fertility index | % | 88.0 | 88.0 | 88.0 | 73.1 |
| Males placed with females | N | 26 | 26 | 25 | 26 |
| Total number mated | N | 25 | 25 | 24 | 26 |
| male mating index | % | 96.2 | 96.2 | 96.0 | 100.0 |
| with females pregnant | N | 22 | 22 | 22 | 19 |
| male fertility index | % | 88.0 | 88.0 | 91.7 | 73.1 |
| Females with defined Day 0 of Gestation | N | 26 | 25 | 25 | 26 |

| | Cohabitation data - group summary incidence | Table 15 |
|---|---|---|

| Dose Group: | | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| Dose Level (mg/m$^3$): | | 0 | 2,000 | 10,000 | 20,000 |
| Number of days to mating | Mean | 2.3 | 2.6 | 2.8 | 2.6 |
| | S.D. | 1.04 | 1.32 | 1.89 | 1.24 |
| Day 1 to 4 | N | 26 | 24 | 22 | 26 |
| | % | 100.0 | 96.0 | 88.0 | 100.0 |
| Day 5 to 8 | N | 0 | 1 | 3 | 0 |
| | % | 0.0 | 4.0 | 12.0 | 0.0 |
| Day 9 to 14 | N | 0 | 0 | 0 | 0 |
| | % | 0.0 | 0.0 | 0.0 | 0.0 |
| Day 15 to 21 | N | 0 | 0 | 0 | 0 |
| | % | 0.0 | 0.0 | 0.0 | 0.0 |

| Females | Delivery and litter data - group mean values | Table 16 |
|---|---|---|

| | | Group: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| | | Dose level (mg/m$^3$): | 0 | 2,000 | 10,000 | 20,000 |
| Females on study (pregnant females) | | N | 22 | 22 | 22 | 19 |
| Females Completing Delivery | | N | 22 | 22 | 22 | 19 |
| | | % | 100.0 | 100.0 | 100.0 | 100.0 |
| Gestation Length (days)[a] | | Mean | 22.3 | 22.2 | 22.2 | 22.2 |
| | | S.D. | 0.57 | 0.50 | 1.05 | 0.42 |
| | | N | 22 | 22 | 22 | 19 |
| Implantation Sites[a] | | Total | 310 | 318 | 302 | 280 |
| | | Mean | 14.1 | 14.5 | 13.7 | 14.7 |
| | | S.D. | 1.19 | 2.34 | 2.60 | 2.16 |
| | | N | 22 | 22 | 22 | 19 |
| Females with Liveborn | | N | 22 | 22 | 22 | 19 |
| *Gestation Index* | | *%* | *100.0* | *100.0* | *100.0* | *100.0* |
| Pups Delivered (total)[a] | | N | 290 | 292 | 276 | 252 |
| | | Mean | 13.2 | 13.3 | 12.5 | 13.3 |
| | | S.D. | 1.56 | 1.67 | 2.56 | 1.76 |
| *Unaccounted-for implantation sites* | | *%* | *6.5* | *8.2* | *8.6* | *10.0* |
| Pups Delivered Live[a] | | Total | 254 | 266 | 263 | 245 |
| | | Mean | 11.5 | 12.1 | 12.0 | 12.9 |
| | | S.D. | 2.92 | 1.77 | 2.30 | 1.85 |
| | | N | 22 | 22 | 22 | 19 |
| *Delivery Index* | | *%* | *81.9* | *83.6* | *87.1* | *87.5* |
| *Live Birth Index* | | *%* | *87.6* | *91.1* | *95.3* | *97.2* |

[a]No statistically significant differences from control mean

| Females | Delivery and litter data - group mean values | Table 16 |
|---|---|---|

| | | Group: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| | | Dose level (mg/m$^3$): | 0 | 2,000 | 10,000 | 20,000 |
| Pups Found Dead, Missing and/or Cannibalized, or without "Milk Band" PND 0-1 | | | | | | |
| Found dead/missing PND 0-1 | N | | 36 | 26 | 13 | 7 |
| Delivered live | N | | 254 | 266 | 263 | 245 |
| Pup mortality PND 0-1 | % | | 12.4 | 8.9 | 4.7 | 2.8 |
| Litters with pups found dead/missing on PND 0-1 | N | | 11 | 11 | 7 | 3 |
| | % | | 50.0 | 50.0 | 31.8 | 15.8 |
| Pups cannibalized on PND 0-1 | N | | 1 | 2 | 0 | 0 |
| Litters with pups cannibalized on PND 0-1 | N | | 1 | 1 | 0 | 0 |
| | % | | 4.5 | 4.5 | 0.0 | 0.0 |
| Pups without 'milk band' PND 0-1 | N | | 1 | 0 | 0 | 0 |
| Litters with pups without "milk band" on PND 0-1 | N | | 1 | 0 | 0 | 0 |
| | % | | 4.5 | 0.0 | 0.0 | 0.0 |
| Pups Found Dead, Missing and/or Cannibalized, or without "Milk Band" PND 2 | | | | | | |
| Found dead and/or missing PND 2 | N | | 8 | 20 | 14 | 0 |
| Litters with pups found dead on PND 2 | N | | 3 | 7 | 4 | 0 |
| | % | | 13.6 | 31.8 | 18.2 | 0.0 |
| Pups cannibalized on PND 2 | N | | | | 2 | |
| Litters with pups cannibalized on PND 2 | N | | | | 2 | |
| | % | | 0.0 | 0.0 | 9.1 | 0.0 |
| Pups without 'milk band' PND 2 | N | | 2 | 1 | 0 | 0 |
| Litters with pups without "milk band" on PND 2 | N | | 1 | 1 | 0 | 0 |
| | % | | 4.5 | 4.5 | 0.0 | 0.0 |

| Females | Delivery and litter data - group mean values | Table 16 |
|---|---|---|

| | | Group: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| | | Dose level (mg/m$^3$): | 0 | 2,000 | 10,000 | 20,000 |
| Pups found dead/missing PND 1 (live) – PND 4 (pre-cull) | N | | 32 | 51 | 47 | 10 |
| No. live on PND 1 | N | | 254 | 266 | 263 | 245 |
| Pup mortality PND 1-4 | % | | 12.6 | 19.2 | 17.9 | 4.1 |
| Pups alive by PND 4 pre-cull | N | | 222 | 215 | 216 | 235 |
| *Viability Index* | *%* | | *87.4* | *80.8* | *82.1* | *95.9* |
| Culled Day 4 | N | | 36 | 27 | 37 | 50 |
| No. live on PND 4 post-cull | N | | 186 | 188 | 179 | 185 |
| Pups found dead/missing PND 4 (post-cull) - PND 21 | N | | 13 | 6 | 4 | 3 |
| Pup mortality (dead/missing) PND 4 (post-cull) - PND 21 | % | | 7.0 | 3.2 | 2.2 | 1.6 |
| Pups alive by PND 21 | N | | 173 | 182 | 176 | 182 |
| *Lactation Index* | *%* | | *93.0* | *96.8* | *98.3* | *98.4* |
| Sex Ratio - Male Pups: Total Pups | | | | | | |
| Day 0 | N | | 141 | 163 | 148 | 120 |
| | % | | 48.6 | 55.8 | 53.6 | 47.6 |
| Day 21 | N | | 88 | 109 | 100 | 92 |
| | % | | 50.9 | 59.9 | 56.8 | 50.5 |
| Live Pups/Litter (Average) | | | | | | |
| Day 1[a] | Mean | | 11.5 | 12.1 | 12.0 | 12.9 |
| | S.D. | | 2.92 | 1.77 | 2.30 | 1.85 |
| | N | | 22 | 22 | 22 | 19 |
| Day 4 pre-cull[a] | Mean | | 10.1 | 9.8 | 9.8 | 12.4 |
| | S.D. | | 4.39 | 4.33 | 4.62 | 2.24 |
| | N | | 22 | 22 | 22 | 19 |
| Day 4 post-cull[a] | Mean | | 8.5 | 8.5 | 8.1 | 9.7 |
| | S.D. | | 3.31 | 3.62 | 3.45 | 0.65 |
| | N | | 22 | 22 | 22 | 19 |

[a]No statistically significant differences from control mean

| Females | Delivery and litter data - group mean values | Table 16 |
|---|---|---|

| | | Group: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| | | Dose level (mg/m$^3$): | 0 | 2,000 | 10,000 | 20,000 |
| Day 7[a] | | Mean | 8.4 | 8.3 | 8.1 | 9.6 |
| | | S.D. | 3.29 | 3.41 | 3.45 | 0.83 |
| | | N | 22 | 22 | 22 | 19 |
| Day 14[a] | | Mean | 8.3 | 8.3 | 8.0 | 9.6 |
| | | S.D. | 3.27 | 3.40 | 3.55 | 0.83 |
| | | N | 22 | 22 | 22 | 19 |
| Day 21[a] | | Mean | 7.9 | 8.3 | 8.0 | 9.6 |
| | | S.D. | 3.69 | 3.40 | 3.53 | 0.84 |
| | | N | 22 | 22 | 22 | 19 |
| Litters with Liveborn, but no Pups Alive at: | | | | | | |
| PND 1 | | N | 0 | 0 | 0 | 0 |
| | | % | 0.0 | 0.0 | 0.0 | 0.0 |
| PND 4 | | N | 2 | 3 | 2 | 0 |
| | | % | 9.1 | 13.6 | 9.1 | 0.0 |
| PND 21 | | N | 3 | 3 | 2 | 0 |
| | | % | 13.6 | 13.6 | 9.1 | 0.0 |

[a]No statistically significant differences from control mean

| | | |
|---|---|---|
| | Pup clinical observations - group distribution of findings<br>Preface | Table 17 |

**Litter observations:** Litter observations were documented on PND 1, 4, 7, 14 and 21. Observations of dead or missing pups between these days were documented when noted.

**Corresponding dose levels for each group were as follows:**

Group 1 - 0 $mg/m^3$
Group 2 - 2,000 $mg/m^3$
Group 3 - 10,000 $mg/m^3$
Group 4 - 20,000 $mg/m^3$

| | Pup clinical observations - group distribution of findings | Table17 |
|---|---|---|

| Group | Observations | Phase Day | Number of animals affected Postnatal Day 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Digit missing | | | | | | | | | | | | | | | 5 | | | | | | | |
| | No milk in stomach | | 1 | 2 | | | | | | | | | | | | | | | | | | | |
| | Cold to touch | | 1 | 2 | | | | | 1 | | | | | | | | | | | | | | |
| | Pale | | 3 | 1 | | 3 | | | 4 | | | | | | | | | | | | | | |
| | Moribund | | | 2 | | | | | | | | | | | | | | | | | | | |
| | Bruising | | 7 | | | | | | | | | | | | | | | | | | | | |
| | Scab | | | | | 1 | | | 1 | | | | | | | | | | | | | | |
| | Missing limb | | | 2 | | 1 | | | 2 | | | | | | | 2 | | | | | | | 3 |
| | Missing tail | | | 4 | | 3 | | | 4 | | | | | | | 4 | | | | | | | 4 |
| | Swollen | | | | | | | | | | | | | | | 1 | | | | | | | 1 |
| | Found dead | | 13 | 8 | 1 | | | 1 | | | | | | | | | | 1 | 4 | 4 | | | |
| | Missing | | | 17 | | 1 | | | | | | | | | | | | | | | | | |

| | Pup clinical observations - group distribution of findings | Table17 |
|---|---|---|

| Group | Observations | Phase | Number of animals affected | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Postnatal Day | | | | | | | | | | | | | | | | | | | |
| | | Day | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 2 | Digit missing | | | | | | | | | | | | | | | 15 | | | | | | | 16 |
| | Swollen | | | | | | | | 1 | | | | | | | 1 | | | | | | | 1 |
| | Bruising | | 1 | | | | | | | | | | | | | | | | | | | | |
| | No milk in stomach | | | 1 | | | | | | | | | | | | | | | | | | | |
| | Cold to touch | | | 1 | | | | | | | | | | | | | | | | | | | |
| | Moribund | | | 1 | | | | | | | | | | | | | | | | | | | |
| | Missing ear | | 1 | | | | | | | | | | | | | | | | | | | | |
| | Laceration | | 2 | | | | | | | | | | | | | | | | | | | | |
| | Found dead | | 1 | 20 | 1 | 1 | 1 | | | | | | 1 | | | | | | | | | | |
| | Missing | | | 33 | 6 | | | | | | | | | | | | | | | | | | |

| | Pup clinical observations - group distribution of findings | Table17 |
|---|---|---|

| Group | Observations | Phase Day | Number of animals affected Postnatal Day 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | Swollen | | | | | 1 | | | 3 | | | | | | | 1 | | | | | | | 1 |
| | Bruising | | 3 | | | 1 | | | | | | | | | | | | | | | | | |
| | Digit missing | | | | | | | | | | | | | | | 7 | | | | | | | 7 |
| | No milk in stomach | | | | | 1 | | | | | | | | | | | | | | | | | |
| | Pale | | | | | 1 | | | 1 | | | | | | | | | | | | | | |
| | Cold to touch | | 12 | | | | | | | | | | | | | | | | | | | | |
| | Laceration | | 1 | | | | | | | | | | | | | | | | | | | | |
| | Discoloration black, tail | | 1 | | | 1 | | | | | | | | | | | | | | | | | |
| | Scab | | | | | 1 | | | 1 | | | | | | | | | | | | | | |
| | Found dead | | | 14 | | 1 | | | | | 1 | | | 1 | | | | | | | | | |
| | Missing | | | 27 | 5 | | | | | | | | | | | | | | | | | | |

| | Pup clinical observations - group distribution of findings | Table17 |
|---|---|---|

| Group | Observations | Phase Day | Number of animals affected<br>Postnatal Day<br>1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | Scab | | | | | 1 | | | 1 | | | | | | | 1 | | | | | | | |
| | Limb missing | | | 1 | | 1 | | | | | | | | | | | | | | | | | |
| | Tail missing | | | 1 | | 1 | | | | | | | | | | | | | | | | | |
| | Discolored black | | | | | | | | | | | | | | | | | | | | | | 1 |
| | Missing digit | | | | | | | | | | | | | | | 5 | | | | | | | |

| | Pup body weight - group mean values (grams) | Table 18 |
|---|---|---|

| Phase | Day of age (before cull) | | Day of age (after cull) | | | |
|---|---|---|---|---|---|---|
| Day | 1 | 4 | 4 | 7 | 14 | 21 |
| Group 1 - 0 mg/m$^3$ | | | | | | |
| Mean | 6.0 | 8.2 | 8.2 | 11.4 | 21.5 | 37.0 |
| SD | 0.85 | 1.08 | 1.07 | 1.33 | 2.46 | 4.23 |
| N | 22 | 20 | 20 | 20 | 20 | 19 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | |
| Mean | 6.5 | 8.7 | 8.7 | 12.5 | 22.5 | 37.2 |
| SD | 1.17 | 1.18 | 1.19 | 3.57 | 1.54 | 3.60 |
| N | 22 | 19 | 19 | 19 | 19 | 19 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | |
| Mean | 6.5 | 8.9 | 8.9 | 11.8 | 22.0 | 36.2 |
| SD | 0.92 | 1.60 | 1.60 | 2.18 | 4.05 | 7.46 |
| N | 22 | 20 | 20 | 20 | 20 | 20 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | |
| Mean | 6.6 | 8.9 | 9.0 | 12.3* | 22.9* | 38.7* |
| SD | 0.97 | 1.36 | 1.35 | 1.36 | 1.70 | 3.47 |
| N | 19 | 19 | 19 | 19 | 19 | 19 |

* = $p < 0.05$

| | Parental macropathology - group distribution of findings | Table 19 |
|---|---|---|

Envigo
Mettlers Road
P.O. Box 2360
Rat/CD IGS

Incidence Summary Report for Gross Necropsy Observations by Animal
Study number: 14-4417
All Sacrifices
Study start date: 03-Mar-15

Printed: 17-Feb-16
Page: 1
Segment III/Inhalation

| | -- Males -- | | | | | -- Females -- | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Group: | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| Number in subgroup(s) 1: | 26 | 26 | 26 | 26 | 0 | 26 | 26 | 26 | 26 | 0 |
| Within Normal Limits ..... | 23 | 22 | 24 | 25 | 0 | 4 | 4 | 3 | 5 | 0 |
| Epididymides | | | | | | | | | | |
| Soft ..... | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ileum | | | | | | | | | | |
| Diverticulum ..... | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Jejunum | | | | | | | | | | |
| Diverticulum ..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Kidneys | | | | | | | | | | |
| Cyst ..... | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lungs | | | | | | | | | | |
| Discolored ..... | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 3 | 0 |
| Cyst ..... | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Muscle (other) | | | | | | | | | | |
| Mass(es) ..... | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Pituitary | | | | | | | | | | |
| Enlarged ..... | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Small ..... | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Skin (other) | | | | | | | | | | |
| Scab ..... | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Stomach | | | | | | | | | | |
| Abnormal Contents ..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Testes | | | | | | | | | | |
| Soft ..... | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Thymus | | | | | | | | | | |
| Discolored ..... | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Small ..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Uterus w/ Cervix | | | | | | | | | | |
| Implantation scars ..... | 0 | 0 | 0 | 0 | 0 | 22 | 22 | 23 | 19 | 0 |

| | | |
|---|---|---|
| | Pup necropsy observations - group distribution of findings | Table 20 |

| Tissue/Organ and Findings | Group | Number of pups affected 1M | 2M | 3M | 4M |
|---|---|---|---|---|---|
| Number of animals within normal limits | | 56 | 55 | 60 | 55 |
| Tail missing | | 1 | | | |
| Spleen - small | | | 2 | | 1 |

| | | |
|---|---|---|
| | Pup necropsy observations - group distribution of findings | Table 20 |

| Tissue/Organ and Findings | Group | Number of pups affected 1F | 2F | 3F | 4F |
|---|---|---|---|---|---|
| Number of animals within normal limits | | 50 | 50 | 49 | 54 |
| Left hind limb toes cannibalized | | 1 | | | |
| Spleen - small | | | 2 | | 1 |

| Males | Parental organ weights - group mean values (grams) | Table 21 |
|---|---|---|

| | Term bwt | Brain | | | Pituitary | | | Adrenal Glands | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (g) | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | |
| Mean | 594.0 | 2.3158 | 0.3921 | 100.0000 | 0.0137 | 0.0023 | 0.5914 | 0.0554 | 0.0094 | 2.3956 |
| SD | 48.26 | 0.11439 | 0.03465 | | 0.00242 | 0.00044 | 0.09834 | 0.00936 | 0.00177 | 0.40211 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 586.1 | 2.3548 | 0.4048 | 100.0000 | 0.0137 | 0.0023 | 0.5817 | 0.0567 | 0.0097 | 2.4130 |
| SD | 57.77 | 0.10571 | 0.03682 | | 0.00210 | 0.00028 | 0.08349 | 0.00774 | 0.00127 | 0.35792 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 594.3 | 2.3745 | 0.4042 | 100.0000 | 0.0129 | 0.0022 | 0.5437 | 0.0562 | 0.0095 | 2.3648 |
| SD | 67.61 | 0.08160 | 0.04467 | | 0.00231 | 0.00046 | 0.10251 | 0.01044 | 0.00195 | 0.43578 |
| N | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 597.7 | 2.3324 | 0.3942 | 100.0000 | 0.0133 | 0.0022 | 0.5694 | 0.0592 | 0.0100 | 2.5384 |
| SD | 68.16 | 0.09108 | 0.04001 | | 0.00223 | 0.00044 | 0.08924 | 0.00876 | 0.00150 | 0.35625 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |

No statistically significant differences from control mean

| Males | Parental organ weights - group mean values (grams) | Table 21 |
|---|---|---|

| | Term bwt | Spleen | | | Kidneys | | | Liver | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (g) | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | |
| Mean | 594.0 | 1.0712 | 0.1809 | 46.3489 | 3.6870 | 0.6235 | 159.3469 | 16.5907 | 2.8007 | 717.6252 |
| SD | 48.26 | 0.23387 | 0.04100 | 10.40290 | 0.32115 | 0.06416 | 13.36008 | 1.77031 | 0.30102 | 80.42881 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 586.1 | 1.0685 | 0.1826 | 45.4477 | 3.9935* | 0.6816** | 169.3695 | 17.1568 | 2.9249 | 728.3318 |
| SD | 57.77 | 0.20771 | 0.03337 | 8.98448 | 0.55327 | 0.06727 | 19.92677 | 2.51407 | 0.29877 | 99.31366 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 594.3 | 1.0616 | 0.1794 | 44.7456 | 4.0361* | 0.6835** | 170.1285 | 17.5177 | 2.9470 | 737.8124 |
| SD | 67.61 | 0.15247 | 0.02294 | 6.46804 | 0.41667 | 0.06960 | 18.00378 | 2.39534 | 0.21251 | 98.81637 |
| N | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 597.7 | 1.0432 | 0.1751 | 44.7517 | 4.2311** | 0.7085** | 181.1459** | 18.6089** | 3.1100** | 797.5717** |
| SD | 68.16 | 0.14586 | 0.01907 | 6.12253 | 0.63809 | 0.07478 | 23.92772 | 2.90328 | 0.29770 | 117.22645 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |

* = $p < 0.05$,** = $p < 0.01$

| Males | Parental organ weights - group mean values (grams) | Table 21 |
|---|---|---|

| | Term bwt | Lungs w/ Trachea | | | Epididymis Right | | | Epididymis Left | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (g) | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | |
| Mean | 594.0 | 2.0619 | 0.3484 | 88.9889 | 0.8286 | 0.1399 | 35.7976 | 0.8259 | 0.1397 | 35.6953 |
| SD | 48.26 | 0.23819 | 0.04164 | 8.89207 | 0.08377 | 0.01404 | 3.31364 | 0.08149 | 0.01562 | 3.32355 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 586.1 | 2.0607 | 0.3542 | 87.6829 | 0.7893 | 0.1355 | 33.5246 | 0.7895 | 0.1356 | 33.5358 |
| SD | 57.77 | 0.24626 | 0.05171 | 11.21774 | 0.08590 | 0.01676 | 3.40686 | 0.09988 | 0.01903 | 4.05474 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 594.3 | 2.1366 | 0.3614 | 90.0129 | 0.8188 | 0.1392 | 34.5171 | 0.8267 | 0.1406 | 34.8544 |
| SD | 67.61 | 0.24643 | 0.03713 | 10.23316 | 0.08392 | 0.01885 | 3.70251 | 0.08323 | 0.01937 | 3.75725 |
| N | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 597.7 | 2.0328 | 0.3459 | 87.4122 | 0.8103 | 0.1366 | 34.7126 | 0.8069 | 0.1361 | 34.5637 |
| SD | 68.16 | 0.23301 | 0.04084 | 11.09752 | 0.08066 | 0.01607 | 2.79243 | 0.08403 | 0.01746 | 3.01865 |
| N | 26 | 25 | 25 | 25 | 26 | 26 | 26 | 26 | 26 | 26 |

No statistically significant differences from control mean

| Males | Parental organ weights - group mean values (grams) | Table 21 |
|---|---|---|

| | Term bwt | Prostate | | | Seminal Vesicles | | | Testis Right | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (g) | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | |
| Mean | 594.0 | 1.1833 | 0.2006 | 51.0383 | 2.2734 | 0.3828 | 98.5776 | 1.9885 | 0.3365 | 85.9453 |
| SD | 48.26 | 0.28462 | 0.04813 | 11.96059 | 0.51186 | 0.07920 | 23.67540 | 0.16308 | 0.03505 | 6.75775 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 586.1 | 1.2842 | 0.2201 | 54.7092 | 2.1760 | 0.3737 | 92.4955 | 1.9936 | 0.3418 | 84.7161 |
| SD | 57.77 | 0.35875 | 0.06419 | 15.94117 | 0.27644 | 0.05241 | 11.68116 | 0.16361 | 0.02916 | 6.69952 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 594.3 | 1.3028 | 0.2219 | 55.0914 | 2.2429 | 0.3808 | 94.5374 | 2.0243 | 0.3437 | 85.2781 |
| SD | 67.61 | 0.34987 | 0.06240 | 15.50952 | 0.29391 | 0.05567 | 12.62773 | 0.16493 | 0.03765 | 6.63716 |
| N | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 597.7 | 1.1720 | 0.1984 | 50.2307 | 2.3725 | 0.4010 | 101.6954 | 1.9911 | 0.3354 | 85.2434 |
| SD | 68.16 | 0.30802 | 0.05559 | 12.91379 | 0.37732 | 0.07458 | 15.42885 | 0.21215 | 0.03867 | 7.14463 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |

No statistically significant differences from control mean

| Males | Parental organ weights - group mean values (grams) | Table 21 |
|---|---|---|

| | Term bwt | Testis Left | | |
|---|---|---|---|---|
| | (g) | (g) | %Body | %Brain |
| Group 1 - 0 mg/m$^3$ | | | | |
| Mean | 594.0 | 1.9882 | 0.3364 | 85.9165 |
| SD | 48.26 | 0.17269 | 0.03617 | 6.95714 |
| N | 26 | 26 | 26 | 26 |
| Group 2 - 2,000 mg/m$^3$ | | | | |
| Mean | 586.1 | 1.9519 | 0.3352 | 82.9588 |
| SD | 57.77 | 0.20914 | 0.04087 | 8.84041 |
| N | 26 | 26 | 26 | 26 |
| Group 3 - 10,000 mg/m$^3$ | | | | |
| Mean | 594.3 | 2.0274 | 0.3442 | 85.3992 |
| SD | 67.61 | 0.15874 | 0.03685 | 6.25811 |
| N | 25 | 25 | 25 | 25 |
| Group 4 - 20,000 mg/m$^3$ | | | | |
| Mean | 597.7 | 1.9858 | 0.3346 | 85.0397 |
| SD | 68.16 | 0.21470 | 0.04054 | 7.64091 |
| N | 26 | 26 | 26 | 26 |

No statistically significant differences from control mean

| Females | Parental organ weights - group mean values (grams) | Table 21 |
|---|---|---|

| | Term bwt | Brain | | | Pituitary | | | Adrenal Glands | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (g) | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | |
| Mean | 302.6 | 2.0459 | 0.6778 | 100.0000 | 0.0152 | 0.0050 | 0.7458 | 0.0670 | 0.0221 | 3.2765 |
| SD | 17.11 | 0.09099 | 0.04221 | | 0.00268 | 0.00092 | 0.13592 | 0.01509 | 0.00471 | 0.74124 |
| N | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 301.4 | 2.0401 | 0.6784 | 100.0000 | 0.0146 | 0.0049 | 0.7195 | 0.0610 | 0.0202 | 2.9970 |
| SD | 17.77 | 0.08574 | 0.04066 | | 0.00157 | 0.00043 | 0.08598 | 0.01161 | 0.00350 | 0.62489 |
| N | 19 | 19 | 19 | 19 | 18 | 18 | 18 | 19 | 19 | 19 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 312.2 | 2.0840 | 0.6709 | 100.0000 | 0.0149 | 0.0048 | 0.7162 | 0.0623 | 0.0201 | 2.9991 |
| SD | 23.24 | 0.10032 | 0.05957 | | 0.00185 | 0.00059 | 0.10224 | 0.00811 | 0.00349 | 0.44266 |
| N | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 301.5 | 2.0522 | 0.6825 | 100.0000 | 0.0143 | 0.0047 | 0.6962 | 0.0622 | 0.0207 | 3.0337 |
| SD | 17.09 | 0.07299 | 0.03942 | | 0.00212 | 0.00062 | 0.10138 | 0.00916 | 0.00350 | 0.43767 |
| N | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 |

No statistically significant differences from control mean

| Females | Parental organ weights - group mean values (grams) | Table 21 |
|---|---|---|

| | Term bwt | Ovaries | | | Spleen | | | Kidneys | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (g) | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | |
| Mean | 302.6 | 0.0883 | 0.0291 | 4.3107 | 0.5672 | 0.1873 | 27.7148 | 2.0509 | 0.6790 | 100.4180 |
| SD | 17.11 | 0.01910 | 0.00593 | 0.90573 | 0.07057 | 0.01897 | 3.15409 | 0.13619 | 0.04711 | 7.84963 |
| N | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 301.4 | 0.0826 | 0.0274 | 4.0508 | 0.5974 | 0.1987 | 29.3299 | 1.9999 | 0.6649 | 98.1163 |
| SD | 17.77 | 0.01592 | 0.00511 | 0.79931 | 0.06467 | 0.02414 | 3.36935 | 0.19682 | 0.06959 | 9.79048 |
| N | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 312.2 | 0.0922 | 0.0297 | 4.4443 | 0.6220 | 0.1996 | 29.8541 | 2.1501 | 0.6897 | 103.5729 |
| SD | 23.24 | 0.02214 | 0.00856 | 1.18658 | 0.07499 | 0.02195 | 3.38667 | 0.30748 | 0.09199 | 16.96218 |
| N | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 301.5 | 0.0907 | 0.0301 | 4.4224 | 0.5491 | 0.1822 | 26.7685 | 2.1121 | 0.7011 | 103.0707 |
| SD | 17.09 | 0.02046 | 0.00680 | 1.01220 | 0.07480 | 0.02365 | 3.67013 | 0.25378 | 0.07769 | 13.02263 |
| N | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 |

No statistically significant differences from control mean

| Females | Parental organ weights - group mean values (grams) | Table 21 |
|---|---|---|

| | Term bwt | Liver | | | Lungs w/ Trachea | | | Uterus w/ Cervix | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (g) | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | |
| Mean | 302.6 | 10.4445 | 3.4484 | 510.3595 | 1.3096 | 0.4332 | 64.0924 | 0.6356 | 0.2099 | 31.1308 |
| SD | 17.11 | 1.47540 | 0.41096 | 65.32636 | 0.10054 | 0.02835 | 5.18149 | 0.14729 | 0.04564 | 7.28998 |
| N | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 301.4 | 10.4121 | 3.4566 | 511.0471 | 1.3262 | 0.4402 | 65.0550 | 0.5995 | 0.1990 | 29.5244 |
| SD | 17.77 | 1.03737 | 0.30654 | 54.49341 | 0.12205 | 0.03472 | 5.88089 | 0.11921 | 0.03935 | 6.43541 |
| N | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 312.2 | 11.3939 | 3.6551 | 548.5320 | 1.2911 | 0.4155 | 61.9080 | 0.6907 | 0.2225 | 33.1145 |
| SD | 23.24 | 1.42466 | 0.42114 | 79.17439 | 0.32285 | 0.10247 | 15.63171 | 0.20124 | 0.06833 | 9.57519 |
| N | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 301.5 | 10.8640 | 3.6021 | 530.4407 | 1.3586 | 0.4517 | 66.2393 | 0.5997 | 0.1990 | 29.2122 |
| SD | 17.09 | 1.09779 | 0.27937 | 61.14353 | 0.08449 | 0.03265 | 4.16703 | 0.18795 | 0.06233 | 9.12888 |
| N | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 |

No statistically significant differences from control mean

| Males | Pup organ weights - group mean values (grams) | Table 22 |
|---|---|---|

| | Term bwt | Spleen wt | | | Thymus wt | | | Brain wt | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (g) | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 1 - 0.0 mg/m$^3$ | | | | | | | | | | |
| Mean | 37.7263 | 0.1422 | 0.3684 | 10.1683 | 0.1594 | 0.4211 | 11.4585 | 1.3869 | 3.7425 | 100.0000 |
| SD | 5.87299 | 0.04824 | 0.06932 | 3.13328 | 0.04040 | 0.07557 | 2.73880 | 0.07116 | 0.46719 | |
| N | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 38.1368 | 0.1421 | 0.3695 | 10.2462 | 0.1573 | 0.4130 | 11.3230 | 1.3953 | 3.7167 | 100.0000 |
| SD | 4.51801 | 0.03563 | 0.06858 | 2.75033 | 0.03111 | 0.06739 | 2.39568 | 0.07985 | 0.56793 | |
| N | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 37.3550 | 0.1357 | 0.3589 | 9.6125 | 0.1654 | 0.4286 | 11.6733 | 1.3868 | 3.9515 | 100.0000 |
| SD | 7.97301 | 0.03555 | 0.04808 | 2.16421 | 0.05131 | 0.08884 | 3.37122 | 0.16303 | 1.24766 | |
| N | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 39.8789 | 0.1464 | 0.3631 | 10.3998 | 0.1635 | 0.4120 | 11.6577 | 1.4025 | 3.5486 | 100.0000 |
| SD | 4.35515 | 0.03965 | 0.07449 | 2.64653 | 0.02305 | 0.05585 | 1.57811 | 0.05313 | 0.32393 | |
| N | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 |

No statistically significant differences from control mean

| Females | Pup organ weights - group mean values (grams) | Table 22 |
|---|---|---|

| | Term bwt | Spleen wt | | | Thymus wt | | | Brain wt | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (g) | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 1 - 0.0 mg/m$^3$ | | | | | | | | | | |
| Mean | 34.9105 | 0.1250 | 0.3534 | 9.3983 | 0.1557 | 0.4503 | 11.7911 | 1.3181 | 3.8627 | 100.0000 |
| SD | 6.65181 | 0.04467 | 0.07471 | 2.89981 | 0.02845 | 0.06938 | 1.96433 | 0.06260 | 0.50230 | |
| N | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 36.7579 | 0.1451 | 0.3882 | 10.7398 | 0.1674 | 0.4550 | 12.4246 | 1.3550 | 3.7410 | 100.0000 |
| SD | 4.27126 | 0.04331 | 0.08018 | 3.13868 | 0.03202 | 0.06189 | 2.61443 | 0.08187 | 0.56991 | |
| N | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 36.5947 | 0.1345 | 0.3644 | 9.7009 | 0.1734 | 0.4740 | 12.5729 | 1.3815* | 3.7967 | 100.0000 |
| SD | 3.50769 | 0.02968 | 0.05459 | 1.94002 | 0.03094 | 0.07150 | 2.27884 | 0.06740 | 0.27829 | |
| N | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | |
| Mean | 38.1632* | 0.1468 | 0.3812 | 10.8385 | 0.1693 | 0.4441 | 12.5377 | 1.3518* | 3.5644 | 100.0000 |
| SD | 3.60697 | 0.03946 | 0.08137 | 2.75390 | 0.02393 | 0.05001 | 1.77505 | 0.06341 | 0.28563 | |
| N | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 |

* = $p < 0.05$

| | Parental histopathology - group distribution of findings | Table 23 |
|---|---|---|

| | | Number of animals affected | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group/Sex | 1M | 2M | 3M | 4M | 1F | 2F | 3F | 4F |
| Tissue/Organ and Findings | No. of animals | 11 | 4 | 3 | 11 | 12 | 2 | 2 | 12 |
| Adrenals | No. examined | 10 | 0 | 1 | 10 | 10 | 0 | 0 | 10 |
| Vacuolation, Cortical | Minimal | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | Slight | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| | Total | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| Epididymides | No. examined | 10 | 1 | 1 | 10 | - | - | - | - |
| Sperm, Absent | Total | 0 | 1 | 0 | 0 | - | - | - | - |
| Ileum | No. examined | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Diverticulum | Total | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Jejunum | No. examined | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Diverticulum | Total | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Kidneys | No. examined | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cyst(s), Cortical | Slight | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

| | Parental histopathology - group distribution of findings | Table 23 |
|---|---|---|

| | | Number of animals affected | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group/Sex | 1M | 2M | 3M | 4M | 1F | 2F | 3F | 4F |
| Tissue/Organ and Findings | No. of animals | 11 | 4 | 3 | 11 | 12 | 2 | 2 | 12 |
| Lungs and Bronchi | No. examined | 11 | 1 | 2 | 11 | 10 | 1 | 0 | 12 |
| Alveolar Macrophage Aggregation | Minimal | 1 | 0 | 0 | 2 | 3 | 0 | 0 | 4 |
| | Slight | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 |
| | Total | 2 | 0 | 0 | 2 | 4 | 1 | 0 | 5 |
| Pulmonary Acinar Ectasia | Total | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Hemorrhage, Agonal | Total | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 |
| Pulmonary Fibrosis, Pleura | Slight | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| | Total | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Major Factor(s) contributing to death | No. examined | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Undetermined | Total | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Ovaries | No. examined | - | - | - | - | 10 | 0 | 0 | 10 |
| Pituitary | No. examined | 10 | 0 | 1 | 10 | 11 | 0 | 0 | 10 |

| | Parental histopathology - group distribution of findings | Table 23 |
|---|---|---|

| | | Number of animals affected | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group/Sex | 1M | 2M | 3M | 4M | 1F | 2F | 3F | 4F |
| Tissue/Organ and Findings | No. of animals | 11 | 4 | 3 | 11 | 12 | 2 | 2 | 12 |
| Prostate | No. examined | 10 | 0 | 1 | 10 | - | - | - | - |
| Infiltrate, Inflammatory Cell | Minimal | 2 | 0 | 0 | 0 | - | - | - | - |
| | Total | 2 | 0 | 0 | 0 | - | - | - | - |
| Seminal Vesicles | No. examined | 10 | 0 | 1 | 10 | - | - | - | - |
| Skeletal Muscle | No. examined | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| M-fibrosarcoma | Total | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Skin and Subcutis | No. examined | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hyperplasia, Epidermal | Slight | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Scab(s) | Slight | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Stomach | No. examined | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Erosion, Nonglandular Region | Slight | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

| | Parental histopathology - group distribution of findings | Table 23 |
|---|---|---|

| | | Number of animals affected | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Group/Sex | 1M | 2M | 3M | 4M | 1F | 2F | 3F | 4F |
| Tissue/Organ and Findings | No. of animals | 11 | 4 | 3 | 11 | 12 | 2 | 2 | 12 |
| Testes | No. examined | 10 | 1 | 1 | 10 | - | - | - | - |
| Degeneration/Atrophy, Tubular | Marked | 0 | 1 | 0 | 0 | - | - | - | - |
| | Total | 0 | 1 | 0 | 0 | - | - | - | - |
| Thymus | No. examined | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| Hemorrhage, Agonal | Total | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| Lymphoid Depletion | Slight | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | Total | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Uterus | No. examined | - | - | - | - | 10 | 0 | 0 | 10 |
| Vagina | No. examined | - | - | - | - | 10 | 0 | 0 | 10 |

| Males | Sperm analysis - group mean values - sperm motility | Table 24 |
|---|---|---|

| | Motility | | Cauda epididymis count | | | Testis Count | | |
|---|---|---|---|---|---|---|---|---|
| | Motile sperm (%) | Progressively motile sperm % | Weight (g) | Sperm count (millions/g) | Total (million) | Weight (g) | Sperm count (millions/g) | Total (million) |
| Group 1 - 0 mg/m$^3$ | | | | | | | | |
| Mean | 96.7 | 67.5 | 0.3574 | 82.5 | 29.3 | 1.9885 | 17.7 | 34.9 |
| SD | 3.2 | 10.4 | 0.0396 | 30.5 | 11.0 | 0.1631 | 5.2 | 10.5 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | |
| Mean | 97.0 | 61.9 | 0.3550 | 87.5 | 31.1 | 1.9936 | 19.3 | 38.8 |
| SD | 3.0 | 12.6 | 0.0510 | 24.2 | 9.8 | 0.1636 | 5.1 | 11.5 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | |
| Mean | 97.0 | 62.1 | 0.3697 | 96.9 | 36.6 | 2.0307 | 18.4 | 37.3 |
| SD | 2.5 | 10.8 | 0.0485 | 40.5 | 16.7 | 0.1566 | 4.7 | 9.0 |
| N | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | |
| Mean | 96.7 | 66.8 | 0.3586 | 89.7 | 32.5 | 1.9911 | 18.2 | 36.0 |
| SD | 3.0 | 9.8 | 0.0555 | 30.0 | 12.8 | 0.2121 | 5.2 | 10.2 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |

No statistically significant differences from control mean

| Males | Sperm analysis - group mean values - sperm morphology | Table 24 |
|---|---|---|

| | Normal | | Decapitate | | Head abnormal | | Neck abnormal | | Tail abnormal | | Mid tail blob | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | number | % | number | % | number | % | number | % | number | % | number | % |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | |
| Mean | 195.7 | 97.8 | 0.5 | 0.2 | 0.4 | 0.2 | 0.0 | 0.0 | 0.9 | 0.5 | 2.5 | 1.3 |
| SD | 4.3 | 2.1 | 0.8 | 0.4 | 0.8 | 0.4 | 0.2 | 0.1 | 1.4 | 0.7 | 4.0 | 2.0 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | |
| Mean | 195.8 | 97.9 | 0.5 | 0.3 | 0.8 | 0.4 | 0.1 | 0.0 | 0.5 | 0.3 | 2.2 | 1.1 |
| SD | 4.0 | 2.0 | 0.8 | 0.4 | 0.8 | 0.4 | 0.3 | 0.1 | 0.9 | 0.5 | 3.6 | 1.8 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | |
| Mean | 195.2 | 97.6 | 0.7 | 0.3 | 0.7 | 0.4 | 0.3 | 0.2 | 1.1 | 0.5 | 2.0 | 1.0 |
| SD | 3.9 | 2.0 | 1.0 | 0.5 | 1.1 | 0.5 | 0.6 | 0.3 | 1.4 | 0.7 | 3.2 | 1.6 |
| N | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | |
| Mean | 194.8 | 97.4 | 1.1 | 0.6 | 0.4 | 0.2 | 0.1 | 0.0 | 1.1 | 0.6 | 2.4 | 1.2 |
| SD | 4.8 | 2.4 | 3.1 | 1.5 | 0.6 | 0.3 | 0.3 | 0.1 | 2.1 | 1.1 | 2.9 | 1.4 |
| N | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |

No statistically significant differences from control mean

| Males | Animal termination history - individual death statuses | Appendix 1 |
|---|---|---|

| Animal Number | Date of Death | Type of Death | Phase | Phase Day[a] |
|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | |
| 1001 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 1002 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 1003 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 1004 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 1005 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 1006 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 1007 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 1008 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 1009 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 1010 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 1011 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 1012 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 1013 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 1014 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 1015 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 1016 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 1017 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 1018 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 1019 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 1020 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 1021 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 1022 | 09 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 24 |
| 1023 | 09 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 24 |
| 1024 | 09 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 24 |
| 1025 | 09 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 24 |
| 1026 | 09 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 24 |

[a]First day of each phase defined as Day 1. First day of test article administration defined as Precohabitation Day 1

| Males | Animal termination history - individual death statuses | Appendix 1 |
|---|---|---|

| Animal Number | Date of Death | Type of Death | Phase | Phase Day[a] |
|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | |
| 2001 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 2002 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 2003 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 2004 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 2005 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 2006 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 2007 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 2008 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 2009 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 2010 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 2011 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 2012 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 2013 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 2014 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 2015 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 2016 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 2017 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 2018 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 2019 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 2020 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 2021 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 2022 | 09 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 24 |
| 2023 | 09 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 24 |
| 2024 | 09 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 24 |
| 2025 | 09 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 24 |
| 2026 | 09 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 24 |

[a]First day of each phase defined as Day 1. First day of test article administration defined as Precohabitation Day 1

| Males | Animal termination history - individual death statuses | Appendix 1 |
|---|---|---|

| Animal Number | Date of Death | Type of Death | Phase | Phase Day[a] |
|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | |
| 3001 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 3002 | 24 Apr 15 | Humane euthanasia | PRECOHABITATION PHASE | 39 |
| 3003 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 3004 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 3005 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 3006 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 3007 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 3008 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 3009 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 3010 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 3011 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 3012 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 3013 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 3014 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 3015 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 3016 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 3017 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 3018 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 3019 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 3020 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 3021 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 3022 | 09 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 24 |
| 3023 | 09 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 24 |
| 3024 | 09 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 24 |
| 3025 | 09 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 24 |
| 3026 | 09 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 24 |

[a]First day of each phase defined as Day 1. First day of test article administration defined as Precohabitation Day 1

| Males | Animal termination history - individual death statuses | Appendix 1 |
|---|---|---|

| Animal Number | Date of Death | Type of Death | Phase | Phase Day[a] |
|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | |
| 4001 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 4002 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 4003 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 4004 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 4005 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 4006 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 4007 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 4008 | 06 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 21 |
| 4009 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 4010 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 4011 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 4012 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 4013 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 4014 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 4015 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 4016 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 4017 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 4018 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 4019 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 4020 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 4021 | 08 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 23 |
| 4022 | 09 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 24 |
| 4023 | 09 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 24 |
| 4024 | 09 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 24 |
| 4025 | 09 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 24 |
| 4026 | 09 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 24 |

[a]First day of each phase defined as Day 1. First day of test article administration defined as Precohabitation Day 1

| Females | Animal termination history - individual death statuses | Appendix 1 |
|---|---|---|

| Animal Number | Date of Death | Type of Death | Phase | Phase Day[a] |
|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | |
| 1501 | 11 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 1502 | 09 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 1503 | 10 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 1504 | 23 Jun 15 | Terminal sacrifice | GESTATION PHASE | 25 |
| 1505 | 10 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 1506 | 12 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 1507 | 13 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 1508 | 10 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 1509 | 20 Jun 15 | Total litter loss | LACTATION PHASE | 2 |
| 1510 | 10 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 1511 | 13 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 1512 | 23 Jun 15 | Terminal sacrifice | GESTATION PHASE | 25 |
| 1513 | 20 Jun 15 | Total litter loss | LACTATION PHASE | 2 |
| 1514 | 13 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 1515 | 11 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 1516 | 11 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 1517 | 10 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 1518 | 11 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 1519 | 10 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 1520 | 12 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 1521 | 22 Jun 15 | Terminal sacrifice | GESTATION PHASE | 25 |
| 1522 | 07 Jul 15 | Total litter loss | LACTATION PHASE | 18 |
| 1523 | 09 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 1524 | 21 Jun 15 | Terminal sacrifice | GESTATION PHASE | 25 |
| 1525 | 12 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 1526 | 11 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |

[a]First day of each phase defined as Day 1. First day of test article administration defined as Precohabitation Day 1

| Females | Animal termination history - individual death statuses | Appendix 1 |
|---|---|---|

| Animal Number | Date of Death | Type of Death | Phase | Phase Day[a] |
|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | |
| 2501 | 09 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 2502 | 13 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 2503 | 10 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 2504 | 14 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 2505 | 21 Jun 15 | Terminal sacrifice | GESTATION PHASE | 25 |
| 2506 | 21 Jun 15 | Total litter loss | LACTATION PHASE | 2 |
| 2507 | 13 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 2508 | 23 Jun 15 | Terminal sacrifice | GESTATION PHASE | 25 |
| 2509 | 12 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 2510 | 13 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 2511 | 21 Jun 15 | Terminal sacrifice | GESTATION PHASE | 25 |
| 2512 | 09 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 2513 | 12 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 2514 | 12 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 2515 | 10 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 2516 | 23 Jun 15 | Total litter loss | LACTATION PHASE | 2 |
| 2517 | 11 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 2518 | 10 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 2519 | 10 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 2520 | 09 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 2521 | 10 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 2522 | 12 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 2523 | 10 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 2524 | 10 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 2525 | 21 Jun 15 | Terminal sacrifice | GESTATION PHASE | 25 |
| 2526 | 23 Jun 15 | Total litter loss | LACTATION PHASE | 2 |

[a]First day of each phase defined as Day 1. First day of test article administration defined as Precohabitation Day 1

| Females | Animal termination history - individual death statuses | Appendix 1 |
|---|---|---|

| Animal Number | Date of Death | Type of Death | Phase | Phase Day[a] |
|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | |
| 3501 | 10 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 3502 | 23 Jun 15 | Terminal sacrifice | GESTATION PHASE | 25 |
| 3503 | 13 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 3504 | 21 Jun 15 | Total litter loss | LACTATION PHASE | 3 |
| 3505 | 11 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 3506 | 13 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 3507 | 11 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 3508 | 09 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 3509 | 11 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 3510 | 09 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 3511 | 11 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 3512 | 10 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 3513 | 13 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 3514 | 10 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 3515 | 13 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 3516 | 13 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 3517 | 11 Jul 15 | Terminal sacrifice | POSTMATING PHASE | 26 |
| 3518 | 13 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 3519 | 22 Jun 15 | Terminal sacrifice | GESTATION PHASE | 25 |
| 3520 | 12 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 3521 | 22 Jun 15 | Total litter loss | LACTATION PHASE | 2 |
| 3522 | 15 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 3523 | 10 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 3524 | 21 Jun 15 | Terminal sacrifice | GESTATION PHASE | 25 |
| 3525 | 13 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 3526 | 10 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |

[a]First day of each phase defined as Day 1. First day of test article administration defined as Precohabitation Day 1

| Females | Animal termination history - individual death statuses | Appendix 1 |
|---|---|---|

| Animal Number | Date of Death | Type of Death | Phase | Phase Day[a] |
|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | |
| 4501 | 11 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 4502 | 13 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 4503 | 12 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 4504 | 11 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 4505 | 13 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 4506 | 22 Jun 15 | Terminal sacrifice | GESTATION PHASE | 25 |
| 4507 | 21 Jun 15 | Found dead | GESTATION PHASE | 22 |
| 4508 | 21 Jun 15 | Terminal sacrifice | GESTATION PHASE | 25 |
| 4509 | 12 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 4510 | 10 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 4511 | 21 Jun 15 | Terminal sacrifice | GESTATION PHASE | 25 |
| 4512 | 12 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 4513 | 11 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 4514 | 21 Jun 15 | Terminal sacrifice | GESTATION PHASE | 25 |
| 4515 | 10 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 4516 | 09 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 4517 | 11 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 4518 | 10 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 4519 | 23 Jun 15 | Terminal sacrifice | GESTATION PHASE | 25 |
| 4520 | 23 Jun 15 | Terminal sacrifice | GESTATION PHASE | 25 |
| 4521 | 11 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 4522 | 13 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 4523 | 12 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 4524 | 12 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 4525 | 10 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |
| 4526 | 12 Jul 15 | Terminal sacrifice | LACTATION PHASE | 22 |

[a]First day of each phase defined as Day 1. First day of test article administration defined as Precohabitation Day 1

| Males | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PRE | PRC | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 1001 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1002 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1003 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1004 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | | | P | P | P |
| | Dermal general, scab(s), head | | | | | | | | | | | | P | P | | | |
| 1005 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | | | | | |
| | Dermal general, alopecia (head/neck) | | | | | | | | | | | | 2 | 2 | 2 | 2 | 2 |
| 1006 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1007 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1008 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1009 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1010 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |

ts = terminal sacrifice, P = present, 2 = moderate

| Males | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PRE | PRC | | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 1011 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | | | | | | |
| | Dermal general, alopecia (head/neck) | | | | | | | | | | | 2 | 2 | 2 | 2 | 2 | 2 |
| 1012 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1013 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1014 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1015 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1016 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1017 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1018 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1019 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1020 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |

ts = terminal sacrifice, P = present, 2 = moderate

| Males | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PRE | PRC | | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 1021 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1022 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1023 ts | Within normal limits | | P | P | P | P | P | P | | | P | P | P | P | P | P | P |
| | Dermal general, alopecia (head/neck) | | | | | | | | 2 | 2 | | | | | | | |
| 1024 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1025 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 1026 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| Group 2 - 2,000 mg/m3 | | | | | | | | | | | | | | | | | |
| 2001 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2002 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2003 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |

ts = terminal sacrifice, P = present, 2 = moderate

| Males | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PRE | PRC | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 2004 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2005 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2006 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2007 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2008 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2009 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2010 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2011 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2012 ts | Within normal limits | | P | P | | | | | | | | | | | | | |
| | Dermal general, alopecia (torso) | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 2013 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |

ts = terminal sacrifice, P = present, 2 = moderate

| Males | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PRE | PRC | | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 2014 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2015 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2016 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2017 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2018 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2019 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2020 ts | Within normal limits | | P | P | P | P | P | P | P | P | | | | | | | |
| | Dermal general, alopecia (head/neck) | | | | | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 2021 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2022 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2023 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |

ts = terminal sacrifice, P = present, 2 = moderate

| Males | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PRE | PRC | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 2024 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2025 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 2026 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | | | | |
| | General appearance, swollen (limbs/tail), forepaw(s) | | | | | | | | | | | | | P | P | P | P |
| Group 3 - 10,000 mg/m3 | | | | | | | | | | | | | | | | | |
| 3001 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3002 u4 | Within normal limits | | P | P | P | P | P | P | | | | | | | | | |
| | General appearance, swollen (limbs/tail), hind paw(s) | | | | | | | | P | | | | | | | | |
| | Behavior/activity, irregular gait | | | | | | | | P | | | | | | | | |
| 3003 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3004 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |

ts = terminal sacrifice, u4 = humane euthanasia, P = present

| Males | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PRE | PRC | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 3005 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | |
| | Dermal general, alopecia (limbs) | | | | | | | | | | | | | | | | 3 |
| 3006 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3007 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3008 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3009 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3010 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3011 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3012 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3013 ts | Within normal limits | | P | P | P | P | P | P | P | P | | | | | | | |
| | Dermal general, alopecia (head/neck) | | | | | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 3014 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |

ts = terminal sacrifice, P = present, 2 = moderate, 3 = extreme

| Males | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PRE | PRC | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 3015 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3016 ts | Within normal limits | | P | P | P | P | P | P | P | P | | | | | | | |
| | Dermal general, alopecia (head/neck) | | | | | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 3017 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | |
| | Dermal general, scab(s), head | | | | | | | | | | | | | | | | P |
| 3018 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3019 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3020 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3021 ts | Within normal limits | | P | P | | | | | | | | P | P | P | P | P | P |
| | Dermal general, laceration (limbs/tail) | | | | | | | | | | P | | | | | | |
| | Dermal general, laceration (limbs/tail), tail | | | | P | P | P | P | P | P | | | | | | | |
| 3022 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3023 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |

ts = terminal sacrifice, P = present, 2 = moderate

| Males | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PRE | PRC | | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 3024 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3025 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3026 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| Group 4 - 20,000 mg/m3/day | | | | | | | | | | | | | | | | | |
| 4001 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4002 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4003 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4004 ts | Within normal limits | | P | P | P | P | P | | | | | | | | | | |
| | Dermal general, alopecia (head/neck) | | | | | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | Dermal general, scab(s), head | | | | | | | | | | P | P | P | | | | |
| | Ocular, chromodacryorrhea (unilateral) | | | | | | | P | P | P | | | | | | | |
| 4005 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |

ts = terminal sacrifice, P = present, 2 = moderate

| Males | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PRE | PRC | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 4006 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4007 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4008 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4009 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4010 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4011 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4012 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4013 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4014 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4015 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4016 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |

ts = terminal sacrifice, P = present

| Males | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PRE | PRC | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 4017 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4018 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4019 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4020 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4021 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4022 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4023 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4024 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4025 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 4026 ts | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |

ts = terminal sacrifice, P = present

| Males | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PMT | | |
|---|---|---|---|---|---|
| | | Week | 2 | 3 | 4 |
| Group 1 - 0 mg/m$^3$ | | | | | |
| 1001 ts | Within normal limits | | P | P | |
| 1002 ts | Within normal limits | | P | P | |
| 1003 ts | Within normal limits | | P | P | |
| 1004 ts | Within normal limits | | P | | |
| | Dermal general, alopecia (limbs) | | | 2 | |
| 1005 ts | Dermal general, alopecia (head/neck) | | 2 | 2 | |
| 1006 ts | Within normal limits | | P | P | |
| 1007 ts | Within normal limits | | P | P | |
| 1008 ts | Within normal limits | | P | P | |
| 1009 ts | Within normal limits | | P | P | P |
| 1010 ts | Within normal limits | | P | P | P |

ts = terminal sacrifice, P = present, 2 = moderate

| Males | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PMT | | |
|---|---|---|---|---|---|
| | | Week | 2 | 3 | 4 |
| Group 1 - 0 mg/m$^3$ | | | | | |
| 1011 ts | Dermal general, alopecia (limbs) | | | | 2 |
| | Dermal general, alopecia (head/neck) | | 2 | 2 | 2 |
| 1012 ts | Within normal limits | | P | P | P |
| 1013 ts | Within normal limits | | P | P | P |
| 1014 ts | Within normal limits | | P | P | P |
| 1015 ts | Within normal limits | | P | P | P |
| 1016 ts | Within normal limits | | P | P | P |
| 1017 ts | Within normal limits | | P | P | P |
| 1018 ts | Within normal limits | | P | P | P |
| 1019 ts | Within normal limits | | P | P | P |
| 1020 ts | Within normal limits | | P | P | P |

ts = terminal sacrifice, P = present, 2 = moderate

| Males | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PMT | | |
|---|---|---|---|---|---|
| | | Week | 2 | 3 | 4 |
| Group 1 - 0 mg/m$^3$ | | | | | |
| 1021 ts | Within normal limits | | P | P | P |
| 1022 ts | Within normal limits | | P | P | P |
| 1023 ts | Within normal limits | | P | P | P |
| 1024 ts | Within normal limits | | P | P | P |
| 1025 ts | Within normal limits | | P | P | P |
| 1026 ts | Within normal limits | | P | P | P |
| Group 2 - 2,000 mg/m3/day | | | | | |
| 2001 ts | Within normal limits | | P | P | |
| 2002 ts | Within normal limits | | P | P | |
| 2003 ts | Within normal limits | | P | P | |
| 2004 ts | Within normal limits | | P | P | |

ts = terminal sacrifice, P = present

| Males | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PMT | | |
|---|---|---|---|---|---|
| | | Week | 2 | 3 | 4 |
| Group 2 - 2,000 mg/m$^3$ | | | | | |
| 2005 ts | Within normal limits | | P | P | |
| 2006 ts | Within normal limits | | P | P | |
| 2007 ts | Within normal limits | | P | P | |
| 2008 ts | Within normal limits | | P | P | |
| 2009 ts | Within normal limits | | P | P | P |
| 2010 ts | Within normal limits | | P | P | P |
| 2011 ts | Within normal limits | | P | P | P |
| 2012 ts | Dermal general, alopecia (torso) | | 2 | 2 | 2 |
| 2013 ts | Within normal limits | | P | P | P |
| 2014 ts | Within normal limits | | P | P | P |
| 2015 ts | Within normal limits | | P | P | P |

ts = terminal sacrifice, P = present, 2 = moderate

| Males | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PMT | | |
|---|---|---|---|---|---|
| | | Week | 2 | 3 | 4 |
| Group 2 - 2,000 mg/m$^3$ | | | | | |
| 2016 ts | Within normal limits | | P | | |
| | Dermal general, alopecia (head/neck) | | | 3 | 3 |
| | Dermal general, scab(s), head | | | P | P |
| 2017 ts | Within normal limits | | P | P | P |
| 2018 ts | Within normal limits | | P | P | P |
| 2019 ts | Within normal limits | | P | P | P |
| 2020 ts | Dermal general, alopecia (head/neck) | | 2 | 2 | 2 |
| 2021 ts | Within normal limits | | P | P | P |
| 2022 ts | Within normal limits | | P | P | P |
| 2023 ts | Within normal limits | | P | P | P |
| 2024 ts | Within normal limits | | P | P | P |
| 2025 ts | Within normal limits | | P | P | P |

ts = terminal sacrifice, P = present, 2 = moderate, 3 = extreme

| Males | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase / Week | PMT 2 | 3 | 4 |
|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | |
| 2026 ts | General appearance, swollen (limbs/tail), forepaw(s) | | P | P | P |
| Group 3 - 10,000 mg/m$^3$ | | | | | |
| 3001 ts | Within normal limits | | P | P | |
| 3003 ts | Within normal limits | | P | P | |
| 3004 ts | Within normal limits | | P | P | |
| 3005 ts | Dermal general, alopecia (limbs) | | 3 | 3 | |
| 3006 ts | Within normal limits | | P | P | |
| 3007 ts | Within normal limits | | P | P | |
| 3008 ts | Within normal limits | | P | P | |
| 3009 ts | Within normal limits | | P | P | P |

ts = terminal sacrifice, P = present, 3 = extreme

| Males | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase / Week | PMT 2 | 3 | 4 |
|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | |
| 3010 ts | Within normal limits | | P | P | P |
| 3011 ts | Within normal limits | | P | P | P |
| 3012 ts | Within normal limits | | P | P | P |
| 3013 ts | Dermal general, alopecia (head/neck) | | 2 | 2 | 2 |
| 3014 ts | Within normal limits | | P | P | P |
| 3015 ts | Within normal limits | | P | P | P |
| 3016 ts | Dermal general, alopecia (head/neck) | | 2 | 2 | 2 |
| 3017 ts | Within normal limits | | | P | P |
| | Dermal general, scab(s), head | | P | | |
| 3018 ts | Within normal limits | | P | P | P |
| 3019 ts | Within normal limits | | P | P | P |

ts = terminal sacrifice, P = present, 2 = moderate

| Males | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PMT | | |
|---|---|---|---|---|---|
| | | Week | 2 | 3 | 4 |
| Group 3 - 10,000 mg/m$^3$ | | | | | |
| 3020 ts | Within normal limits | | P | P | P |
| 3021 ts | Within normal limits | | P | P | P |
| 3022 ts | Within normal limits | | P | P | P |
| 3023 ts | Within normal limits | | P | P | P |
| 3024 ts | Within normal limits | | P | P | P |
| 3025 ts | Within normal limits | | P | P | P |
| 3026 ts | Within normal limits | | P | P | P |
| Group 4 - 20,000 mg/m$^3$ | | | | | |
| 4001 ts | Within normal limits | | P | P | |
| 4002 ts | Within normal limits | | P | P | |
| 4003 ts | Within normal limits | | P | P | |

ts = terminal sacrifice, P = present

| Males | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PMT | | |
|---|---|---|---|---|---|
| | | Week | 2 | 3 | 4 |
| Group 4 - 20,000 mg/m$^3$ | | | | | |
| 4004 ts | Dermal general, alopecia (head/neck) | | 2 | 2 | |
| 4005 ts | Within normal limits | | P | P | |
| 4006 ts | Within normal limits | | P | P | |
| 4007 ts | Within normal limits | | P | P | |
| 4008 ts | Within normal limits | | P | P | |
| 4009 ts | Within normal limits | | P | P | P |
| 4010 ts | Within normal limits | | P | P | P |
| 4011 ts | Within normal limits | | P | P | P |
| 4012 ts | Within normal limits | | P | P | P |
| 4013 ts | Within normal limits | | P | P | P |
| 4014 ts | Within normal limits | | P | P | P |

ts = terminal sacrifice, P = present, 2 = moderate

| Males | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PMT | | |
|---|---|---|---|---|---|
| | | Week | 2 | 3 | 4 |
| Group 4 - 20,000 mg/m$^3$ | | | | | |
| 4015 ts | Within normal limits | | P | P | P |
| 4016 ts | Within normal limits | | P | P | P |
| 4017 ts | Within normal limits | | P | P | P |
| 4018 ts | Within normal limits | | P | P | P |
| 4019 ts | Within normal limits | | P | P | P |
| 4020 ts | Within normal limits | | P | P | P |
| 4021 ts | Within normal limits | | P | P | P |
| 4022 ts | Within normal limits | | P | P | P |
| 4023 ts | Within normal limits | | P | P | P |
| 4024 ts | Within normal limits | | P | P | P |
| 4025 ts | Within normal limits | | P | P | P |

ts = terminal sacrifice, P = present

| Males | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PMT | | |
|---|---|---|---|---|---|
| | | Week | 2 | 3 | 4 |
| Group 4 - 20,000 mg/m$^3$ | | | | | |
| 4026 ts | Within normal limits | | P | P | P |

ts = terminal sacrifice, P = present

| Females | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PRE | PRC | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 1501 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 1502 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 1503 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 1504 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | |
| 1505 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 1506 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 1507 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 1508 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 1509 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 1510 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 1511 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |

P = present

| Females | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PRE | PRC | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 1512 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 1513 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 1514 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 1515 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 1516 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | | | | |
| | Dermal general, alopecia (head/neck) | | | | | | | | | | | | | 3 | | | |
| 1517 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 1518 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 1519 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 1520 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | | | | | |
| | Dermal general, alopecia (head/neck) | | | | | | | | | | | | 2 | 2 | | | |
| 1521 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |

P = present, 2 = moderate, 3 = extreme

| Females | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PRE | PRC | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 1522 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 1523 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 1524 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 1525 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 1526 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 2501 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 2502 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 2503 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 2504 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 2505 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |

P = present

| Females | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PRE | PRC | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 2506 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 2507 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 2508 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 2509 | Within normal limits | | P | P | | | | | | | | | | | | | |
| | Oral/buccal, incisor(s) broken/missing | | | | P | P | P | P | P | P | P | P | P | P | | | |
| 2510 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 2511 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 2512 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 2513 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 2514 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 2515 | Within normal limits | | P | P | P | P | P | P | P | P | | | | | | | |
| | Dermal general, alopecia (head/neck) | | | | | | | | | | 2 | 2 | 2 | 2 | | | |

P = present, 2 = moderate

| Females | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PRE | PRC | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 2516 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 2517 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 2518 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 2519 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | | | | |
| | Dermal general, alopecia (limbs) | | | | | | | | | | | | | 3 | | | |
| 2520 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 2521 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 2522 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 2523 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 2524 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | |
| 2525 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | | | | |
| | Dermal general, alopecia (torso) | | | | | | | | | | | | | 2 | | | |

P = present, 2 = moderate, 3 = extreme

| Females | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PRE | PRC | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 2526 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 3501 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 3502 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 3503 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | | | | |
| | Dermal general, alopecia (head/neck) | | | | | | | | | | | | | 2 | | | |
| 3504 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 3505 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | | | | | |
| | Dermal general, alopecia (head/neck) | | | | | | | | | | | | 2 | 2 | | | |
| 3506 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 3507 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 3508 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |

P = present, 2 = moderate

| Females | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PRE | PRC | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 3509 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 3510 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 3511 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 3512 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 3513 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 3514 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 3515 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | | |
| | Dermal general, alopecia (head/neck) | | | | | | | | | | | | | | | 2 | |
| 3516 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 3517 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | P | P | P |
| 3518 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |

P = present, 2 = moderate

| Females | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PRE | PRC | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 3519 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 3520 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 3521 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 3522 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 3523 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 3524 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 3525 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 3526 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 4501 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 4502 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |

P = present

| Females | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PRE | PRC | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 4503 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 4504 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 4505 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 4506 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 4507 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 4508 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 4509 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 4510 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 4511 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 4512 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |

P = present

| Females | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PRE | PRC | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 4513 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | | | | | |
| | Dermal general, alopecia (head/neck) | | | | | | | | | | | | 2 | 2 | | | |
| 4514 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 4515 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 4516 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 4517 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 4518 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 4519 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 4520 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 4521 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 4522 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |

P = present, 2 = moderate

| Females | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PRE | PRC | | | | | | | | | | COH | | PMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Week | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 1 | 2 | 1 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | | | | | |
| 4523 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 4524 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 4525 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |
| 4526 | Within normal limits | | P | P | P | P | P | P | P | P | P | P | P | P | | | |

P = present

| Females | Clinical observations during premating, mating and postmating periods - individual observations | Appendix 2 |
|---|---|---|

| Animal Number | Observations | Phase | PMT | | |
|---|---|---|---|---|---|
| | | Week | 2 | 3 | 4 |
| Group 3 - 10,000 mg/m$^3$ | | | | | |
| 3517 | Within normal limits | | P | P | P |

P = present

| Females | Clinical observations during gestation - individual observations | Appendix 3 |
|---|---|---|

| Animal Number | Observations | Phase | GES | | | | |
|---|---|---|---|---|---|---|---|
| | | Day | 0 | 4 | 7 | 14 | 21 |
| Group 1 - 0 mg/m$^3$ | | | | | | | |
| 1501 ts | Within normal limits | | P | P | P | P | P |
| 1502 ts | Within normal limits | | P | P | P | P | P |
| 1503 ts | Within normal limits | | P | P | P | P | P |
| 1504 ts,np | Within normal limits | | | | | P | P |
| 1505 ts | Within normal limits | | P | P | P | P | P |
| 1506 ts | Within normal limits | | P | P | P | P | P |
| 1507 ts | Within normal limits | | P | P | P | P | P |
| 1508 ts | Within normal limits | | P | P | P | P | |
| | Dermal general, alopecia (limbs) | | | | | | 3 |
| 1509 tll | Within normal limits | | P | P | P | P | P |
| 1510 ts | Within normal limits | | P | P | P | P | P |

ts = terminal sacrifice, tll = total litter loss, np = not pregnant, P = present, 3 = extreme

| Females | Clinical observations during gestation - individual observations | Appendix 3 |
|---|---|---|

| Animal Number | Observations | Phase | GES | | | | |
|---|---|---|---|---|---|---|---|
| | | Day | 0 | 4 | 7 | 14 | 21 |
| Group 1 - 0 mg/m$^3$ | | | | | | | |
| 1511 ts | Within normal limits | | P | P | P | P | P |
| 1512 ts,np | Within normal limits | | P | P | P | P | P |
| 1513 tll | Within normal limits | | P | P | P | P | |
| | General appearance, red exudate (limbs/tail) | | | | | | 2 |
| | General appearance, red exudate (head/neck) | | | | | | 2 |
| 1514 ts | Within normal limits | | P | P | P | P | P |
| 1515 ts | Within normal limits | | P | P | P | P | P |
| 1516 ts | Within normal limits | | | | P | P | P |
| | Dermal general, alopecia (head/neck) | | 3 | 3 | | | |
| 1517 ts | Within normal limits | | P | P | P | P | P |
| 1518 ts | Within normal limits | | P | P | P | P | |
| | Dermal general, alopecia (limbs) | | | | | | 2 |

ts = terminal sacrifice, tll = total litter loss, np = not pregnant, P = present, 2 = moderate, 3 = extreme

| Females | Clinical observations during gestation - individual observations | Appendix 3 |
|---|---|---|

| Animal Number | Observations | Phase | GES | | | | |
|---|---|---|---|---|---|---|---|
| | | Day | 0 | 4 | 7 | 14 | 21 |
| Group 1 - 0 mg/m$^3$ | | | | | | | |
| 1519 ts | Within normal limits | | P | | | | |
| | General appearance, swollen (limbs/tail), forepaw(s) | | | | P | P | |
| | Dermal general, alopecia (limbs) | | | 2 | 2 | 2 | 2 |
| | Dermal general, stains on fur (head/neck) | | | | | | P |
| 1520 ts | Dermal general, alopecia (head/neck) | | 2 | 2 | 2 | 2 | 2 |
| 1521 ts,np | Within normal limits | | P | P | P | P | P |
| 1522 tll | Within normal limits | | P | P | P | P | |
| | Dermal general, alopecia (limbs) | | | | | | 2 |
| 1523 ts | Within normal limits | | P | P | P | P | P |
| 1524 ts,np | Within normal limits | | P | P | P | P | P |
| 1525 ts | Within normal limits | | P | P | P | P | P |
| 1526 ts | Within normal limits | | P | P | P | P | P |

ts = terminal sacrifice, tll = total litter loss, np = not pregnant, P = present, 2 = moderate

| Females | Clinical observations during gestation - individual observations | Appendix 3 |
|---|---|---|

| Animal Number | Observations | Phase | GES | | | | |
|---|---|---|---|---|---|---|---|
| | | Day | 0 | 4 | 7 | 14 | 21 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | |
| 2501 ts | Within normal limits | | P | P | P | P | P |
| 2502 ts | Within normal limits | | P | P | P | P | P |
| 2503 ts | Within normal limits | | P | P | P | P | P |
| 2504 ts | Within normal limits | | P | P | P | P | P |
| 2505 ts,np | Within normal limits | | P | P | P | P | P |
| 2506 tll | Within normal limits | | P | P | P | P | P |
| 2507 ts | Within normal limits | | P | P | P | P | P |
| 2508 ts,np | Within normal limits | | P | P | P | P | P |
| 2509 ts | Oral/buccal, incisor(s) broken/missing | | P | P | P | P | P |
| 2510 ts | Within normal limits | | P | P | P | P | P |
| 2511 ts,np | Within normal limits | | P | P | P | P | P |

ts = terminal sacrifice, tll = total litter loss, np = not pregnant, P = present

| Females | Clinical observations during gestation - individual observations | Appendix 3 |
|---|---|---|

| Animal Number | Observations | Phase | GES | | | | |
|---|---|---|---|---|---|---|---|
| | | Day | 0 | 4 | 7 | 14 | 21 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | |
| 2512 ts | Within normal limits | | P | P | P | P | P |
| 2513 ts | Within normal limits | | P | P | P | P | P |
| 2514 ts | Within normal limits | | P | P | P | P | P |
| 2515 ts | Dermal general, alopecia (limbs) | | | | | | 2 |
| | Dermal general, alopecia (head/neck) | | 2 | 2 | 2 | 2 | |
| 2516 tll | Within normal limits | | P | P | P | P | P |
| 2517 ts | Within normal limits | | P | P | P | P | P |
| 2518 ts | Within normal limits | | P | P | P | P | P |
| 2519 ts | Dermal general, alopecia (limbs) | | 3 | 3 | 3 | 3 | 3 |
| 2520 ts | Within normal limits | | P | P | P | | |
| | General appearance, red exudate (limbs/tail) | | | | | | 2 |
| | Dermal general, alopecia (limbs) | | | | | 2 | 2 |

ts = terminal sacrifice, tll = total litter loss, P = present, 2 = moderate, 3 = extreme

| Females | Clinical observations during gestation - individual observations | Appendix 3 |
|---|---|---|

| Animal Number | Observations | Phase / Day | GES 0 | 4 | 7 | 14 | 21 |
|---|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | | |
| 2521 ts | Within normal limits | | P | P | P | P | |
| | Dermal general, alopecia (torso) | | | | | | 2 |
| 2522 ts | Within normal limits | | P | P | P | P | P |
| 2523 ts | Within normal limits | | P | P | P | P | P |
| 2524 ts | Within normal limits | | | | | P | |
| | Dermal general, stains on fur (head/neck), head | | | | | | P |
| 2525 ts,np | Dermal general, alopecia (torso) | | 2 | 2 | 2 | 2 | 2 |
| 2526 tll | Within normal limits | | P | P | P | P | P |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | |
| 3501 ts | Within normal limits | | P | P | P | P | P |
| 3502 ts,np | Within normal limits | | P | P | P | P | P |

ts = terminal sacrifice, tll = total litter loss, np = not pregnant, P = present, 2 = moderate

| Females | Clinical observations during gestation - individual observations | Appendix 3 |
|---|---|---|

| Animal Number | Observations | Phase | GES | | | | |
|---|---|---|---|---|---|---|---|
| | | Day | 0 | 4 | 7 | 14 | 21 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | |
| 3503 ts | Within normal limits | | | P | P | P | P |
| | Dermal general, alopecia (head/neck) | | 2 | | | | |
| 3504 tll | Within normal limits | | P | P | P | | |
| | General appearance, red exudate (limbs/tail) | | | | | | 2 |
| | Dermal general, alopecia (limbs) | | | | | 2 | 2 |
| 3505 ts | Within normal limits | | | | P | P | P |
| | Dermal general, alopecia (head/neck) | | 2 | 2 | | | |
| 3506 ts | Within normal limits | | P | P | P | P | P |
| 3507 ts | Within normal limits | | P | P | P | P | P |
| 3508 ts | Within normal limits | | P | P | P | P | P |
| 3509 ts | Within normal limits | | P | P | P | P | P |
| 3510 ts | Within normal limits | | P | P | P | P | P |
| 3511 ts | Within normal limits | | P | P | P | P | P |

ts = terminal sacrifice, tll = total litter loss, P = present, 2 = moderate

| Females | Clinical observations during gestation - individual observations | Appendix 3 |
|---|---|---|

| Animal Number | Observations | Phase / Day | GES 0 | 4 | 7 | 14 | 21 |
|---|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | | |
| 3512 ts | Within normal limits | | P | P | P | P | P |
| 3513 ts | Within normal limits | | P | P | P | P | P |
| 3514 ts | Within normal limits | | P | P | P | P | P |
| 3515 ts | Dermal general, alopecia (head/neck) | | | | | 2 | |
| 3516 ts | Within normal limits | | P | P | P | P | P |
| 3518 ts | Within normal limits | | P | P | P | P | P |
| 3519 ts,np | Within normal limits | | P | P | P | P | P |
| 3520 ts | Within normal limits | | P | P | P | P | P |
| 3521 tll | Within normal limits | | P | P | P | P | P |
| 3522 ts | Within normal limits | | P | P | P | P | P |

ts = terminal sacrifice, tll = total litter loss, np = not pregnant, P = present, 2 = moderate

| Females | Clinical observations during gestation - individual observations | Appendix 3 |
|---|---|---|

| Animal Number | Observations | Phase | GES | | | | |
|---|---|---|---|---|---|---|---|
| | | Day | 0 | 4 | 7 | 14 | 21 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | |
| 3523 ts | Within normal limits | | P | P | P | | |
| | Dermal general, alopecia (limbs) | | | | | 2 | 2 |
| 3524 ts,np | Within normal limits | | | P | P | P | P |
| 3525 ts | Within normal limits | | P | P | P | P | P |
| 3526 ts | Within normal limits | | P | P | P | P | P |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | |
| 4501 ts | Within normal limits | | P | P | P | P | P |
| 4502 ts | Within normal limits | | P | P | P | P | P |
| 4503 ts | Within normal limits | | P | P | P | P | |
| | Dermal general, alopecia (torso) | | | | | | 2 |
| 4504 ts | Within normal limits | | P | P | | | |
| | Dermal general, alopecia (limbs) | | | | 2 | 2 | 2 |

ts = terminal sacrifice, np = not pregnant, P = present, 2 = moderate

| Females | Clinical observations during gestation - individual observations | Appendix 3 |
|---|---|---|

| Animal Number | Observations | Phase | GES | | | | |
|---|---|---|---|---|---|---|---|
| | | Day | 0 | 4 | 7 | 14 | 21 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | |
| 4505 ts | Within normal limits | | P | P | P | P | P |
| 4506 ts,np | Within normal limits | | P | P | P | P | P |
| 4507 u1 | Within normal limits | | P | P | P | P | P |
| 4508 ts,np | Within normal limits | | P | P | P | P | P |
| 4509 ts | Within normal limits | | P | P | P | P | P |
| 4510 ts | Within normal limits | | P | P | P | P | P |
| 4511 ts,np | Within normal limits | | P | P | P | P | P |
| 4512 ts | Within normal limits | | P | P | P | P | P |
| 4513 ts | Within normal limits | | P | P | P | P | P |
| 4514 ts,np | Within normal limits | | P | P | P | P | P |
| 4515 ts | Within normal limits | | P | P | P | P | P |

ts = terminal sacrifice, u1 = found dead, np = not pregnant, P = present

| Females | Clinical observations during gestation - individual observations | Appendix 3 |
|---|---|---|

| Animal Number | Observations | Phase | GES | | | | |
|---|---|---|---|---|---|---|---|
| | | Day | 0 | 4 | 7 | 14 | 21 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | |
| 4516 ts | Within normal limits | | P | P | P | P | P |
| 4517 ts | Within normal limits | | P | P | P | P | P |
| 4518 ts | Within normal limits | | P | P | P | P | P |
| 4519 ts,np | Within normal limits | | P | P | P | P | P |
| 4520 ts,np | Within normal limits | | P | P | P | P | P |
| 4521 ts | Within normal limits | | P | P | P | P | P |
| 4522 ts | Within normal limits | | P | P | P | P | P |
| 4523 ts | Within normal limits | | P | P | P | P | P |
| 4524 ts | Within normal limits | | P | P | P | P | P |
| 4525 ts | Within normal limits | | P | P | P | P | P |
| 4526 ts | Within normal limits | | P | P | P | P | P |

ts = terminal sacrifice, np = not pregnant, P = present

| Females | Clinical observations during lactation - individual observations | Appendix 4 |
|---|---|---|

| Animal Number | Observations | Phase | LAC | | | | |
|---|---|---|---|---|---|---|---|
| | | Day | 1 | 4 | 7 | 14 | 21 |
| Group 1 - 0 mg/m$^3$ | | | | | | | |
| 1501 ts | Within normal limits | | P | P | P | P | P |
| 1502 ts | Within normal limits | | P | P | P | P | P |
| 1503 ts | Within normal limits | | P | P | | | |
| | Ocular, chromodacryorrhea (unilateral) | | | | P | P | P |
| 1505 ts | Within normal limits | | P | P | P | P | P |
| 1506 ts | Within normal limits | | P | P | P | P | P |
| 1507 ts | Within normal limits | | P | P | P | P | P |
| 1508 ts | Dermal general, alopecia (limbs) | | 3 | 3 | 3 | 3 | 3 |
| 1509 tll | Within normal limits | | P | | | | |
| 1510 ts | Within normal limits | | P | P | P | P | P |
| 1511 ts | Within normal limits | | P | P | P | P | P |

ts = terminal sacrifice, tll = total litter loss, P = present, 3 = extreme

| Females | Clinical observations during lactation - individual observations | Appendix 4 |
|---|---|---|

| Animal Number | Observations | Phase | LAC | | | | |
|---|---|---|---|---|---|---|---|
| | | Day | 1 | 4 | 7 | 14 | 21 |
| Group 1 - 0 mg/m$^3$ | | | | | | | |
| 1513 tll | General appearance, red exudate (limbs/tail) | | 2 | | | | |
| | General appearance, red exudate (head/neck) | | 2 | | | | |
| 1514 ts | Within normal limits | | P | P | P | P | P |
| 1515 ts | Dermal general, alopecia (limbs) | | 2 | 2 | 2 | 2 | 2 |
| 1516 ts | Within normal limits | | P | P | P | P | P |
| 1517 ts | Within normal limits | | P | P | P | P | P |
| 1518 ts | Dermal general, alopecia (limbs) | | 2 | 2 | 2 | 2 | 2 |
| 1519 ts | Dermal general, alopecia (limbs) | | 2 | 2 | 2 | 2 | 2 |
| | Dermal general, stains on fur (head/neck) | | P | P | | | |
| 1520 ts | Dermal general, alopecia (head/neck) | | 2 | 2 | 2 | 2 | 2 |
| 1522 tll | Dermal general, alopecia (limbs) | | 2 | 2 | 2 | 2 | |
| 1523 ts | Within normal limits | | P | P | P | P | P |

ts = terminal sacrifice, tll = total litter loss, P = present, 2 = moderate

| Females | Clinical observations during lactation - individual observations | Appendix 4 |
|---|---|---|

| Animal Number | Observations | Phase | LAC | | | | |
|---|---|---|---|---|---|---|---|
| | | Day | 1 | 4 | 7 | 14 | 21 |
| Group 1 - 0 mg/m$^3$ | | | | | | | |
| 1525 ts | Within normal limits | | P | P | P | P | P |
| 1526 ts | Within normal limits | | P | P | P | P | P |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | |
| 2501 ts | Within normal limits | | P | P | P | P | P |
| 2502 ts | Within normal limits | | P | P | P | P | P |
| 2503 ts | Within normal limits | | P | P | P | P | P |
| 2504 ts | Within normal limits | | P | P | P | P | P |
| 2506 tll | Within normal limits | | P | | | | |
| 2507 ts | Within normal limits | | P | P | P | P | P |
| 2509 ts | Oral/buccal, incisor(s) broken/missing | | P | P | P | P | P |
| 2510 ts | Within normal limits | | P | P | P | P | P |

ts = terminal sacrifice, tll = total litter loss, P = present

| Females | Clinical observations during lactation - individual observations | Appendix 4 |
|---|---|---|

| Animal Number | Observations | Phase | LAC | | | | |
|---|---|---|---|---|---|---|---|
| | | Day | 1 | 4 | 7 | 14 | 21 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | |
| 2512 ts | Within normal limits | | P | P | P | P | P |
| 2513 ts | Within normal limits | | P | P | P | P | P |
| 2514 ts | Within normal limits | | P | P | P | P | P |
| 2515 ts | Dermal general, alopecia (limbs) | | 3 | 3 | 3 | 3 | 3 |
| 2516 tll | Within normal limits | | P | | | | |
| 2517 ts | Within normal limits | | P | P | P | P | P |
| 2518 ts | Within normal limits | | P | P | P | P | P |
| 2519 ts | Dermal general, alopecia (limbs) | | 3 | 3 | 3 | 3 | 3 |
| 2520 ts | General appearance, red exudate (limbs/tail) | | 2 | | | | |
| | Dermal general, alopecia (limbs) | | 2 | 2 | 2 | 2 | 2 |
| 2521 ts | Dermal general, alopecia (torso) | | 2 | 2 | 2 | 2 | 2 |

ts = terminal sacrifice, tll = total litter loss, P = present, 2 = moderate, 3 = extreme

| Females | Clinical observations during lactation - individual observations | Appendix 4 |
|---|---|---|

| Animal Number | Observations | Phase | LAC | | | | |
|---|---|---|---|---|---|---|---|
| | | Day | 1 | 4 | 7 | 14 | 21 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | |
| 2522 ts | Within normal limits | | P | P | P | P | P |
| 2523 ts | Within normal limits | | P | P | P | P | P |
| 2524 ts | Within normal limits | | P | P | P | P | P |
| 2526 tll | Within normal limits | | P | | | | |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | |
| 3501 ts | Within normal limits | | P | P | P | P | P |
| 3503 ts | Within normal limits | | P | P | P | P | P |
| 3504 tll | General appearance, red exudate (limbs/tail) | | 2 | | | | |
| | Dermal general, alopecia (limbs) | | 2 | | | | |
| 3505 ts | Within normal limits | | P | P | P | P | P |
| 3506 ts | Within normal limits | | P | P | P | P | P |

ts = terminal sacrifice, tll = total litter loss, P = present, 2 = moderate

| Females | Clinical observations during lactation - individual observations | Appendix 4 |
|---|---|---|

| Animal Number | Observations | Phase | LAC | | | | |
|---|---|---|---|---|---|---|---|
| | | Day | 1 | 4 | 7 | 14 | 21 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | |
| 3507 ts | Within normal limits | | P | P | P | P | P |
| 3508 ts | Within normal limits | | P | P | P | P | P |
| 3509 ts | Within normal limits | | P | P | P | P | P |
| 3510 ts | Within normal limits | | P | P | P | P | P |
| 3511 ts | Within normal limits | | P | P | P | P | P |
| 3512 ts | Within normal limits | | P | P | P | P | P |
| 3513 ts | Within normal limits | | P | P | P | P | P |
| 3514 ts | Within normal limits | | P | | | | |
| | Dermal general, alopecia (limbs) | | | 2 | 2 | 2 | 2 |
| 3515 ts | Dermal general, alopecia (head/neck) | | 2 | 2 | 2 | 2 | 2 |
| 3516 ts | Within normal limits | | P | P | P | P | P |

ts = terminal sacrifice, P = present, 2 = moderate

| Females | Clinical observations during lactation - individual observations | Appendix 4 |
|---|---|---|

| Animal Number | Observations | Phase | LAC | | | | |
|---|---|---|---|---|---|---|---|
| | | Day | 1 | 4 | 7 | 14 | 21 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | |
| 3518 ts | Within normal limits | | P | P | P | P | P |
| 3520 ts | Within normal limits | | P | P | P | P | P |
| 3521 tll | Dermal general, ano-genital staining | | 2 | | | | |
| 3522 ts | Within normal limits | | P | P | P | P | P |
| 3523 ts | Dermal general, alopecia (limbs) | | 2 | 2 | 2 | 2 | 2 |
| | Dermal general, alopecia (torso) | | | | 2 | 2 | 2 |
| 3525 ts | Within normal limits | | P | P | P | P | P |
| 3526 ts | Within normal limits | | P | P | P | P | P |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | |
| 4501 ts | Within normal limits | | P | P | P | P | P |
| 4502 ts | Within normal limits | | P | P | P | P | P |

ts = terminal sacrifice, tll = total litter loss, P = present, 2 = moderate

| Females | Clinical observations during lactation - individual observations | Appendix 4 |
|---|---|---|

| Animal Number | Observations | Phase | LAC | | | | |
|---|---|---|---|---|---|---|---|
| | | Day | 1 | 4 | 7 | 14 | 21 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | |
| 4503 ts | Dermal general, alopecia (torso) | | 2 | 2 | 2 | 2 | 2 |
| 4504 ts | Dermal general, alopecia (limbs) | | 2 | 2 | 2 | 2 | 2 |
| 4505 ts | Dermal general, alopecia (limbs) | | 2 | 2 | 2 | 2 | 2 |
| 4509 ts | Within normal limits | | P | P | P | P | P |
| 4510 ts | Within normal limits | | P | P | P | P | P |
| 4512 ts | Within normal limits | | P | P | P | P | P |
| 4513 ts | Within normal limits | | P | P | P | P | P |
| 4515 ts | Within normal limits | | P | P | P | P | P |
| 4516 ts | Within normal limits | | P | P | P | P | P |
| 4517 ts | Within normal limits | | P | P | P | P | P |
| 4518 ts | Within normal limits | | P | P | P | P | P |

ts = terminal sacrifice, P = present, 2 = moderate

| Females | Clinical observations during lactation - individual observations | Appendix 4 |
|---|---|---|

| Animal Number | Observations | Phase | LAC | | | | |
|---|---|---|---|---|---|---|---|
| | | Day | 1 | 4 | 7 | 14 | 21 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | |
| 4521 ts | Within normal limits | | P | P | P | P | P |
| 4522 ts | Within normal limits | | P | P | P | P | P |
| 4523 ts | Within normal limits | | P | P | | | |
| | Dermal general, alopecia (limbs) | | | | 3 | 3 | 3 |
| 4524 ts | Within normal limits | | P | P | P | P | P |
| 4525 ts | Within normal limits | | P | P | P | P | P |
| 4526 ts | Within normal limits | | P | P | | | |
| | Dermal general, alopecia (limbs) | | | | 2 | 2 | 2 |

ts = terminal sacrifice, P = present, 2 = moderate, 3 = extreme

| Males | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | PRE 2 | PRC 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | |
| 1001 ts | | 152.3 | 192.4 | 253.8 | 315.9 | 356.7 | 397.5 | 431.2 | 452.7 | 471.3 | 486.5 | 498.4 | 515.2 |
| 1002 ts | | 183.8 | 234.9 | 301.7 | 369.2 | 419.7 | 461.0 | 495.7 | 526.1 | 540.1 | 549.4 | 560.7 | 576.9 |
| 1003 ts | | 170.7 | 211.7 | 271.7 | 326.5 | 369.5 | 406.1 | 437.4 | 467.4 | 486.4 | 506.2 | 518.9 | 539.1 |
| 1004 ts | | 165.4 | 201.0 | 260.1 | 316.8 | 372.8 | 403.6 | 440.6 | 474.5 | 499.7 | 523.5 | 530.0 | 536.7 |
| 1005 ts | | 163.6 | 208.9 | 270.8 | 317.2 | 363.1 | 410.6 | 428.9 | 450.7 | 466.1 | 483.8 | 489.4 | 502.1 |
| 1006 ts | | 161.8 | 201.5 | 250.1 | 296.9 | 339.4 | 375.7 | 396.7 | 418.0 | 433.6 | 456.1 | 465.5 | 482.3 |
| 1007 ts | | 152.7 | 191.7 | 244.7 | 295.5 | 336.2 | 377.6 | 413.4 | 439.5 | 466.5 | 486.3 | 500.4 | 512.2 |
| 1008 ts | | 178.0 | 226.5 | 289.7 | 347.8 | 393.2 | 435.0 | 467.6 | 490.0 | 515.6 | 542.7 | 558.1 | 573.3 |
| 1009 ts | | 158.3 | 203.6 | 261.3 | 322.4 | 375.6 | 421.2 | 449.9 | 475.5 | 497.2 | 515.4 | 536.2 | 549.6 |
| 1010 ts | | 177.8 | 224.2 | 289.3 | 356.8 | 402.6 | 445.9 | 475.3 | 505.1 | 530.6 | 551.1 | 572.9 | 595.4 |
| 1011 ts | | 168.6 | 203.7 | 254.2 | 299.4 | 331.4 | 360.1 | 382.2 | 404.1 | 418.9 | 438.1 | 444.9 | 461.8 |
| 1012 ts | | 192.9 | 234.5 | 290.1 | 340.7 | 388.8 | 433.0 | 462.0 | 488.1 | 511.7 | 537.7 | 550.5 | 561.4 |
| 1013 ts | | 193.1 | 238.8 | 304.1 | 371.8 | 421.2 | 458.6 | 493.0 | 516.4 | 534.7 | 556.6 | 569.5 | 588.4 |
| 1014 ts | | 166.5 | 211.8 | 273.0 | 337.6 | 393.5 | 432.5 | 475.5 | 507.2 | 535.7 | 564.2 | 574.7 | 600.8 |
| 1015 ts | | 177.6 | 219.2 | 288.7 | 346.8 | 398.6 | 422.5 | 457.5 | 481.0 | 501.3 | 525.0 | 537.0 | 552.9 |
| 1016 ts | | 151.7 | 194.4 | 252.9 | 313.1 | 367.3 | 405.1 | 446.7 | 469.9 | 500.1 | 521.2 | 535.3 | 548.0 |
| 1017 ts | | 151.0 | 182.0 | 232.1 | 273.8 | 306.9 | 341.2 | 364.2 | 387.2 | 409.7 | 426.2 | 451.4 | 464.0 |
| 1018 ts | | 200.1 | 244.8 | 318.0 | 376.5 | 412.8 | 458.1 | 487.8 | 517.1 | 529.9 | 550.4 | 562.8 | 580.0 |
| 1019 ts | | 155.1 | 194.9 | 256.9 | 305.2 | 352.4 | 382.0 | 417.0 | 445.0 | 457.4 | 478.9 | 485.4 | 499.3 |
| 1020 ts | | 153.4 | 199.0 | 264.8 | 330.1 | 385.6 | 430.1 | 472.0 | 505.3 | 528.6 | 557.1 | 567.2 | 579.6 |
| 1021 ts | | 168.4 | 211.9 | 276.9 | 344.0 | 397.7 | 451.9 | 493.4 | 524.6 | 562.2 | 593.5 | 615.4 | 636.5 |
| 1022 ts | | 162.6 | 203.8 | 257.1 | 308.3 | 348.5 | 381.0 | 417.6 | 445.6 | 462.2 | 488.2 | 492.2 | 508.6 |
| 1023 ts | | 166.3 | 214.1 | 271.1 | 327.4 | 372.2 | 416.1 | 446.0 | 469.9 | 494.4 | 520.0 | 523.1 | 540.4 |
| 1024 ts | | 171.7 | 222.3 | 282.3 | 345.4 | 386.1 | 434.3 | 461.7 | 493.6 | 515.8 | 535.6 | 544.5 | 569.0 |
| 1025 ts | | 162.1 | 205.3 | 257.8 | 297.5 | 329.2 | 363.9 | 397.4 | 412.4 | 431.8 | 447.8 | 464.6 | 483.9 |

ts = terminal sacrifice

| Males | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | PRE 2 | PRC 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | |
| 1026 ts | | 180.7 | 222.2 | 279.3 | 329.2 | 369.6 | 409.3 | 435.8 | 455.4 | 476.9 | 496.6 | 517.8 | 531.9 |
| Mean | | 168.7 | 211.5 | 271.3 | 327.4 | 372.7 | 412.1 | 444.1 | 470.1 | 491.5 | 513.0 | 525.6 | 541.9 |
| SD | | 13.61 | 16.00 | 20.21 | 25.78 | 29.39 | 32.63 | 35.26 | 37.99 | 40.12 | 42.19 | 43.01 | 44.50 |
| N | | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |

ts = terminal sacrifice

| Males | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | PRE 2 | PRC 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | |
| 2001 ts | | 159.5 | 197.1 | 248.9 | 292.7 | 327.1 | 354.8 | 379.8 | 403.1 | 417.5 | 431.0 | 445.6 | 430.1 |
| 2002 ts | | 180.6 | 222.9 | 296.2 | 368.3 | 416.9 | 461.2 | 495.6 | 532.5 | 557.5 | 579.8 | 598.5 | 588.2 |
| 2003 ts | | 171.4 | 208.5 | 254.0 | 294.8 | 328.6 | 362.2 | 390.0 | 414.2 | 439.2 | 462.4 | 475.8 | 484.3 |
| 2004 ts | | 162.5 | 202.7 | 257.3 | 307.6 | 355.2 | 388.3 | 420.1 | 451.5 | 477.1 | 497.4 | 527.5 | 540.8 |
| 2005 ts | | 157.6 | 204.2 | 270.4 | 325.0 | 369.7 | 406.4 | 427.9 | 459.5 | 486.0 | 510.4 | 524.5 | 523.9 |
| 2006 ts | | 151.3 | 192.9 | 245.2 | 296.4 | 342.0 | 379.3 | 411.5 | 442.3 | 465.7 | 488.8 | 506.1 | 508.7 |
| 2007 ts | | 164.7 | 205.6 | 265.1 | 321.1 | 367.5 | 403.8 | 429.7 | 455.0 | 478.2 | 506.0 | 524.2 | 541.4 |
| 2008 ts | | 170.8 | 215.6 | 271.4 | 321.0 | 364.3 | 402.1 | 427.2 | 431.2 | 459.8 | 480.3 | 492.5 | 496.1 |
| 2009 ts | | 158.1 | 198.2 | 261.3 | 321.3 | 374.3 | 412.9 | 439.8 | 462.9 | 468.5 | 498.3 | 514.9 | 521.2 |
| 2010 ts | | 174.2 | 216.8 | 273.6 | 331.3 | 376.2 | 411.9 | 441.9 | 434.2 | 418.6 | 452.1 | 486.1 | 517.0 |
| 2011 ts | | 143.4 | 176.0 | 220.4 | 264.8 | 301.2 | 336.2 | 368.6 | 388.3 | 416.9 | 433.8 | 450.7 | 466.5 |
| 2012 ts | | 160.8 | 202.4 | 255.8 | 318.7 | 372.5 | 417.5 | 446.4 | 470.3 | 505.6 | 524.2 | 541.8 | 561.1 |
| 2013 ts | | 194.6 | 244.8 | 321.7 | 385.2 | 440.1 | 475.5 | 511.9 | 539.1 | 563.5 | 572.9 | 581.1 | 604.3 |
| 2014 ts | | 165.3 | 202.7 | 260.4 | 322.5 | 379.8 | 410.9 | 446.5 | 468.1 | 502.8 | 515.1 | 535.4 | 555.5 |
| 2015 ts | | 163.7 | 198.8 | 253.2 | 310.3 | 345.3 | 372.5 | 394.0 | 418.4 | 437.8 | 455.6 | 469.0 | 469.4 |
| 2016 ts | | 158.8 | 196.1 | 247.8 | 300.4 | 344.0 | 371.7 | 403.3 | 429.7 | 444.4 | 464.8 | 482.9 | 498.2 |
| 2017 ts | | 166.0 | 205.2 | 265.3 | 323.5 | 367.4 | 409.8 | 443.5 | 475.3 | 499.2 | 517.7 | 528.7 | 539.7 |
| 2018 ts | | 148.0 | 190.2 | 249.1 | 309.4 | 352.8 | 385.8 | 424.6 | 451.5 | 481.2 | 506.2 | 528.3 | 545.1 |
| 2019 ts | | 194.5 | 248.0 | 320.9 | 391.7 | 442.2 | 487.3 | 515.3 | 525.2 | 573.4 | 596.1 | 622.4 | 643.0 |
| 2020 ts | | 169.5 | 210.9 | 269.6 | 321.6 | 363.2 | 393.8 | 433.1 | 452.5 | 475.7 | 495.5 | 511.9 | 521.6 |
| 2021 ts | | 161.1 | 206.2 | 266.0 | 332.6 | 399.0 | 442.1 | 481.7 | 514.5 | 557.9 | 588.1 | 597.7 | 620.9 |
| 2022 ts | | 163.8 | 207.5 | 268.2 | 326.1 | 376.4 | 418.0 | 447.3 | 476.9 | 503.3 | 529.3 | 543.5 | 565.8 |
| 2023 ts | | 166.5 | 217.2 | 273.6 | 331.9 | 369.8 | 407.5 | 432.9 | 459.6 | 480.0 | 502.6 | 512.1 | 501.1 |
| 2024 ts | | 170.5 | 215.7 | 284.0 | 345.2 | 400.3 | 436.6 | 474.1 | 491.6 | 527.0 | 546.1 | 545.5 | 550.2 |
| 2025 ts | | 163.7 | 209.3 | 262.8 | 318.4 | 362.2 | 396.0 | 424.2 | 436.9 | 462.2 | 474.8 | 492.3 | 494.4 |

ts = terminal sacrifice

| Males | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | PRE 2 | PRC 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | |
| 2026 ts | | 167.4 | 215.4 | 265.1 | 309.1 | 341.5 | 372.3 | 393.2 | 403.9 | 419.1 | 426.8 | 442.6 | 454.2 |
| Mean | | 165.7 | 208.1 | 266.4 | 322.7 | 368.4 | 404.5 | 434.8 | 457.2 | 481.5 | 502.2 | 518.5 | 528.6 |
| SD | | 11.58 | 15.03 | 21.45 | 27.23 | 32.29 | 35.56 | 37.61 | 39.53 | 46.14 | 47.10 | 46.39 | 50.74 |
| N | | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |

ts = terminal sacrifice

| Males | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | PRE 2 | PRC 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | |
| 3001 ts | | 177.7 | 215.4 | 271.1 | 321.7 | 362.8 | 403.5 | 432.3 | 454.6 | 471.2 | 488.5 | 502.7 | 500.2 |
| 3002 u4 | | 173.5 | 219.2 | 280.9 | 339.8 | 387.5 | 411.2 | 379.2 | | | | | |
| 3003 ts | | 170.3 | 220.4 | 277.1 | 327.1 | 368.5 | 399.4 | 429.4 | 450.8 | 476.3 | 500.0 | 521.0 | 534.3 |
| 3004 ts | | 180.0 | 227.9 | 284.9 | 341.4 | 382.9 | 421.4 | 452.1 | 476.4 | 496.4 | 517.5 | 537.2 | 547.3 |
| 3005 ts | | 162.3 | 202.2 | 259.9 | 311.2 | 357.1 | 395.3 | 436.5 | 461.0 | 486.4 | 506.1 | 529.8 | 543.1 |
| 3006 ts | | 150.2 | 186.6 | 242.3 | 294.7 | 335.1 | 375.7 | 411.7 | 439.1 | 470.3 | 482.0 | 502.5 | 513.3 |
| 3007 ts | | 152.8 | 192.0 | 249.6 | 304.2 | 352.2 | 381.9 | 409.6 | 431.4 | 448.3 | 466.0 | 479.9 | 487.4 |
| 3008 ts | | 161.9 | 189.6 | 241.3 | 286.2 | 324.3 | 355.3 | 375.2 | 391.5 | 407.7 | 419.9 | 435.8 | 447.9 |
| 3009 ts | | 175.4 | 214.6 | 272.4 | 318.4 | 362.6 | 394.6 | 422.9 | 447.1 | 473.8 | 493.7 | 516.8 | 526.9 |
| 3010 ts | | 194.9 | 238.8 | 306.1 | 364.4 | 411.9 | 457.2 | 483.4 | 519.1 | 548.7 | 565.9 | 586.2 | 599.8 |
| 3011 ts | | 153.0 | 187.8 | 235.1 | 283.5 | 314.3 | 348.5 | 380.7 | 405.8 | 440.5 | 456.3 | 469.6 | 482.5 |
| 3012 ts | | 174.9 | 219.4 | 280.1 | 328.9 | 376.3 | 420.2 | 447.3 | 476.3 | 502.3 | 524.0 | 544.5 | 550.6 |
| 3013 ts | | 165.9 | 207.8 | 265.8 | 317.2 | 347.1 | 378.0 | 405.2 | 428.3 | 456.2 | 464.2 | 479.0 | 481.2 |
| 3014 ts | | 167.5 | 218.9 | 295.6 | 367.5 | 416.5 | 458.2 | 488.4 | 508.4 | 527.8 | 554.9 | 571.7 | 576.0 |
| 3015 ts | | 158.2 | 189.3 | 234.5 | 275.4 | 306.0 | 334.5 | 359.8 | 379.5 | 394.8 | 415.6 | 424.8 | 441.7 |
| 3016 ts | | 168.2 | 212.0 | 271.4 | 329.7 | 376.4 | 419.1 | 453.7 | 478.8 | 497.3 | 522.5 | 540.2 | 552.4 |
| 3017 ts | | 186.7 | 236.3 | 315.7 | 389.2 | 446.8 | 494.8 | 535.0 | 557.2 | 569.9 | 617.0 | 636.8 | 643.1 |
| 3018 ts | | 165.9 | 214.7 | 294.0 | 359.1 | 415.7 | 472.4 | 509.8 | 547.8 | 562.7 | 609.0 | 638.3 | 645.5 |
| 3019 ts | | 173.9 | 220.7 | 287.1 | 335.4 | 378.7 | 411.3 | 453.4 | 479.4 | 499.5 | 527.4 | 550.3 | 573.8 |
| 3020 ts | | 170.2 | 222.2 | 294.1 | 359.0 | 416.3 | 470.9 | 511.7 | 549.5 | 563.9 | 591.7 | 613.4 | 637.8 |
| 3021 ts | | 170.8 | 213.2 | 271.6 | 322.7 | 374.6 | 415.8 | 445.7 | 474.4 | 477.2 | 526.5 | 548.0 | 549.1 |
| 3022 ts | | 167.1 | 207.8 | 264.1 | 305.4 | 346.3 | 383.3 | 415.6 | 440.6 | 510.0 | 498.3 | 522.5 | 544.2 |
| 3023 ts | | 168.6 | 210.3 | 268.0 | 318.5 | 362.1 | 397.5 | 422.8 | 447.2 | 464.2 | 480.9 | 492.8 | 515.2 |
| 3024 ts | | 163.6 | 207.8 | 274.4 | 338.0 | 379.6 | 427.0 | 459.1 | 486.2 | 510.0 | 526.1 | 540.1 | 551.6 |
| 3025 ts | | 164.7 | 211.4 | 274.2 | 332.0 | 376.7 | 411.8 | 445.6 | 475.3 | 495.3 | 514.9 | 536.6 | 549.3 |

ts = terminal sacrifice, u4 = humane euthanasia

| Males | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | PRE 2 | PRC 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | |
| 3026 ts | | 167.3 | 213.4 | 275.8 | 325.1 | 362.7 | 389.1 | 413.9 | 428.1 | 441.4 | 453.0 | 473.2 | 487.9 |
| Mean | | 168.7 | 211.5 | 272.6 | 326.8 | 370.8 | 408.8 | 437.7 | 465.4 | 487.7 | 508.9 | 527.7 | 539.3 |
| SD | | 9.93 | 13.84 | 20.54 | 27.09 | 32.93 | 38.64 | 43.34 | 46.05 | 45.00 | 51.68 | 54.48 | 54.58 |
| N | | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 25 | 25 | 25 | 25 | 25 |

ts = terminal sacrifice

| Males | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | PRE 2 | PRC 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | |
| 4001 ts | | 165.1 | 201.7 | 262.3 | 313.7 | 353.0 | 385.5 | 415.6 | 441.8 | 464.0 | 479.9 | 491.8 | 503.0 |
| 4002 ts | | 157.6 | 195.8 | 252.0 | 307.9 | 346.6 | 394.7 | 421.8 | 458.7 | 485.3 | 505.0 | 533.8 | 540.4 |
| 4003 ts | | 180.2 | 230.9 | 309.5 | 372.2 | 423.2 | 464.1 | 493.7 | 517.7 | 544.6 | 571.9 | 584.7 | 569.3 |
| 4004 ts | | 158.4 | 197.2 | 260.5 | 313.9 | 352.5 | 390.7 | 410.9 | 415.3 | 432.2 | 460.8 | 483.5 | 469.6 |
| 4005 ts | | 181.0 | 219.9 | 277.5 | 325.8 | 365.8 | 400.8 | 428.0 | 456.9 | 483.9 | 491.4 | 506.6 | 519.6 |
| 4006 ts | | 152.7 | 189.2 | 242.0 | 288.7 | 331.9 | 358.3 | 381.4 | 416.2 | 454.8 | 466.5 | 484.1 | 498.4 |
| 4007 ts | | 180.1 | 222.7 | 274.5 | 312.2 | 342.1 | 369.2 | 390.1 | 411.4 | 436.4 | 445.3 | 463.4 | 476.1 |
| 4008 ts | | 172.1 | 219.4 | 279.8 | 331.8 | 371.7 | 412.7 | 440.6 | 466.2 | 491.3 | 507.2 | 520.4 | 532.6 |
| 4009 ts | | 200.3 | 247.2 | 323.8 | 391.6 | 438.7 | 490.6 | 524.3 | 559.4 | 588.3 | 598.1 | 606.5 | 622.4 |
| 4010 ts | | 167.0 | 213.4 | 278.9 | 338.1 | 384.1 | 428.6 | 457.9 | 487.6 | 509.7 | 530.0 | 549.7 | 558.3 |
| 4011 ts | | 198.6 | 256.8 | 332.5 | 404.6 | 463.5 | 515.6 | 542.2 | 586.6 | 616.2 | 657.9 | 672.8 | 692.3 |
| 4012 ts | | 179.1 | 222.2 | 288.4 | 348.9 | 387.4 | 427.4 | 455.6 | 492.6 | 503.4 | 524.2 | 546.3 | 559.9 |
| 4013 ts | | 167.2 | 201.6 | 251.1 | 292.0 | 331.1 | 361.2 | 387.4 | 410.4 | 430.1 | 446.1 | 465.1 | 474.5 |
| 4014 ts | | 160.7 | 203.8 | 262.3 | 318.6 | 355.7 | 395.2 | 422.6 | 446.4 | 476.3 | 498.4 | 510.8 | 514.0 |
| 4015 ts | | 157.3 | 203.7 | 275.6 | 342.9 | 393.1 | 440.3 | 481.6 | 510.8 | 538.2 | 560.1 | 572.5 | 584.4 |
| 4016 ts | | 160.0 | 204.4 | 262.9 | 304.2 | 348.0 | 387.2 | 424.2 | 451.0 | 477.9 | 500.4 | 513.1 | 519.8 |
| 4017 ts | | 174.6 | 225.0 | 298.9 | 362.7 | 410.0 | 449.5 | 484.1 | 509.9 | 539.9 | 566.7 | 580.7 | 592.9 |
| 4018 ts | | 165.4 | 203.2 | 261.0 | 315.9 | 357.2 | 386.1 | 419.3 | 437.9 | 464.1 | 484.9 | 494.9 | 507.9 |
| 4019 ts | | 164.9 | 203.9 | 256.0 | 303.5 | 344.7 | 378.7 | 404.3 | 427.9 | 447.2 | 466.7 | 480.9 | 496.1 |
| 4020 ts | | 154.8 | 194.6 | 259.7 | 307.4 | 342.6 | 378.2 | 406.5 | 435.1 | 464.8 | 483.0 | 499.7 | 512.2 |
| 4021 ts | | 161.3 | 205.7 | 270.6 | 334.1 | 384.8 | 435.0 | 442.0 | 460.9 | 477.5 | 537.6 | 559.6 | 593.4 |
| 4022 ts | | 177.8 | 227.8 | 296.4 | 363.6 | 418.1 | 471.5 | 482.9 | 515.9 | 543.1 | 600.2 | 642.3 | 669.1 |
| 4023 ts | | 154.1 | 189.5 | 241.1 | 287.1 | 324.8 | 362.4 | 400.4 | 428.0 | 444.9 | 455.7 | 473.4 | 484.6 |
| 4024 ts | | 163.8 | 210.6 | 270.8 | 325.7 | 363.6 | 407.5 | 436.2 | 451.7 | 480.0 | 496.1 | 516.1 | 529.2 |
| 4025 ts | | 189.7 | 236.3 | 300.3 | 354.7 | 397.7 | 426.5 | 455.4 | 482.1 | 500.9 | 517.1 | 532.4 | 542.5 |

ts = terminal sacrifice

| Males | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | PRE 2 | PRC 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | |
| 4026 ts | | 170.3 | 217.2 | 282.6 | 334.7 | 380.0 | 426.4 | 460.5 | 492.2 | 519.3 | 535.6 | 541.4 | 561.8 |
| Mean | | 169.8 | 213.2 | 275.8 | 330.6 | 373.5 | 413.2 | 441.1 | 468.1 | 492.9 | 514.9 | 531.8 | 543.2 |
| SD | | 13.02 | 17.14 | 23.37 | 30.42 | 35.35 | 40.97 | 41.33 | 45.47 | 46.94 | 52.63 | 53.46 | 56.91 |
| N | | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |

ts = terminal sacrifice

| Males | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | COH 1 | COH 2 | PMT 1 | PMT 2 | PMT 3 | PMT 4 |
|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | | |
| 1001 ts | | 530.4 | 545.8 | 549.2 | 554.9 | 570.0 | |
| 1002 ts | | 592.6 | 612.4 | 624.8 | 628.2 | 628.1 | |
| 1003 ts | | 560.2 | 572.0 | 576.6 | 592.3 | 589.3 | |
| 1004 ts | | 560.3 | 572.8 | 589.2 | 585.5 | 605.5 | |
| 1005 ts | | 530.1 | 546.9 | 547.8 | 543.5 | 551.1 | |
| 1006 ts | | 502.3 | 516.2 | 527.0 | 522.3 | 539.8 | |
| 1007 ts | | 525.5 | 544.8 | 562.2 | 572.2 | 580.1 | |
| 1008 ts | | 582.5 | 600.4 | 608.7 | 631.1 | 643.3 | |
| 1009 ts | | 569.8 | 591.4 | 598.8 | 609.1 | 603.9 | 610.8 |
| 1010 ts | | 596.8 | 612.1 | 622.7 | 640.0 | 645.7 | 663.7 |
| 1011 ts | | 472.5 | 489.1 | 487.2 | 502.7 | 519.9 | 530.6 |
| 1012 ts | | 590.6 | 606.5 | 605.9 | 617.5 | 631.5 | 658.0 |
| 1013 ts | | 599.3 | 598.4 | 599.9 | 611.4 | 624.4 | 638.4 |
| 1014 ts | | 614.0 | 618.6 | 620.5 | 621.2 | 633.9 | 637.3 |
| 1015 ts | | 563.6 | 579.5 | 582.7 | 591.7 | 597.6 | 609.7 |
| 1016 ts | | 565.9 | 566.7 | 572.7 | 576.0 | 590.5 | 599.2 |
| 1017 ts | | 475.1 | 482.7 | 489.2 | 489.8 | 497.9 | 506.7 |
| 1018 ts | | 593.9 | 609.3 | 616.6 | 618.6 | 637.9 | 643.8 |
| 1019 ts | | 524.4 | 538.3 | 535.7 | 546.3 | 550.5 | 555.8 |
| 1020 ts | | 606.6 | 625.4 | 629.6 | 651.6 | 662.0 | 681.0 |
| 1021 ts | | 656.8 | 671.7 | 686.6 | 703.8 | 719.8 | 737.2 |
| 1022 ts | | 527.4 | 539.7 | 547.0 | 554.8 | 569.8 | 581.3 |
| 1023 ts | | 539.9 | 555.5 | 560.4 | 556.7 | 570.4 | 583.8 |
| 1024 ts | | 594.9 | 614.2 | 625.3 | 614.7 | 625.4 | 657.9 |
| 1025 ts | | 503.5 | 513.2 | 520.4 | 527.4 | 526.5 | 536.3 |

ts = terminal sacrifice

| Males | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | COH 1 | COH 2 | PMT 1 | PMT 2 | PMT 3 | PMT 4 |
|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | | |
| 1026 ts | | 539.1 | 555.6 | 560.3 | 566.4 | 578.2 | 590.7 |
| Mean | | 558.4 | 572.3 | 578.7 | 585.8 | 595.9 | 612.3 |
| SD | | 44.64 | 45.04 | 46.64 | 49.32 | 49.74 | 58.73 |
| N | | 26 | 26 | 26 | 26 | 26 | 18 |

ts = terminal sacrifice

| Males | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | COH 1 | COH 2 | PMT 1 | PMT 2 | PMT 3 | PMT 4 |
|---|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | | |
| 2001 ts | | 463.1 | 478.0 | 482.0 | 490.0 | 498.4 | |
| 2002 ts | | 633.5 | 657.3 | 658.3 | 673.7 | 687.0 | |
| 2003 ts | | 499.8 | 512.9 | 517.6 | 528.4 | 533.3 | |
| 2004 ts | | 556.4 | 573.5 | 582.8 | 603.2 | 630.0 | |
| 2005 ts | | 537.6 | 540.5 | 544.1 | 548.8 | 564.5 | |
| 2006 ts | | 518.3 | 533.5 | 545.4 | 544.3 | 552.7 | |
| 2007 ts | | 558.6 | 570.5 | 583.0 | 576.9 | 590.0 | |
| 2008 ts | | 519.7 | 535.8 | 537.9 | 553.7 | 554.9 | |
| 2009 ts | | 537.6 | 555.1 | 558.4 | 568.2 | 575.3 | 584.7 |
| 2010 ts | | 545.1 | 560.1 | 575.3 | 582.0 | 585.7 | 596.8 |
| 2011 ts | | 478.5 | 489.4 | 508.7 | 516.1 | 513.2 | 525.1 |
| 2012 ts | | 578.7 | 590.5 | 592.2 | 611.0 | 628.8 | 644.6 |
| 2013 ts | | 609.2 | 612.8 | 624.4 | 485.5 | 633.7 | 648.9 |
| 2014 ts | | 570.7 | 577.7 | 587.0 | 601.3 | 615.0 | 629.0 |
| 2015 ts | | 483.0 | 492.5 | 504.9 | 519.3 | 524.7 | 534.2 |
| 2016 ts | | 515.7 | 528.5 | 527.0 | 536.8 | 541.8 | 557.0 |
| 2017 ts | | 554.1 | 562.8 | 573.0 | 573.3 | 574.0 | 585.6 |
| 2018 ts | | 552.7 | 568.7 | 574.1 | 578.4 | 592.7 | 603.0 |
| 2019 ts | | 662.0 | 697.6 | 695.3 | 719.2 | 738.0 | 753.6 |
| 2020 ts | | 544.8 | 553.7 | 543.5 | 559.7 | 574.1 | 573.9 |
| 2021 ts | | 636.7 | 640.9 | 654.4 | 668.4 | 689.8 | 714.8 |
| 2022 ts | | 578.3 | 595.0 | 606.9 | 617.7 | 622.7 | 640.8 |
| 2023 ts | | 540.6 | 563.4 | 564.3 | 578.3 | 593.5 | 630.7 |
| 2024 ts | | 597.5 | 616.9 | 588.9 | 604.0 | 616.7 | 633.4 |
| 2025 ts | | 512.2 | 517.4 | 530.7 | 534.5 | 540.1 | 547.0 |

ts = terminal sacrifice

| Males | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | COH 1 | COH 2 | PMT 1 | PMT 2 | PMT 3 | PMT 4 |
|---|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | | |
| 2026 ts | | 460.4 | 470.1 | 483.6 | 482.4 | 489.9 | 502.6 |
| Mean | | 547.9 | 561.4 | 567.1 | 571.4 | 586.9 | 605.9 |
| SD | | 51.98 | 54.73 | 52.45 | 57.43 | 59.70 | 64.32 |
| N | | 26 | 26 | 26 | 26 | 26 | 18 |

ts = terminal sacrifice

| Males | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | COH 1 | COH 2 | PMT 1 | PMT 2 | PMT 3 | PMT 4 |
|---|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | | |
| 3001 ts | | 505.0 | 518.8 | 524.9 | 532.5 | 536.7 | |
| 3002 u4 | | | | | | | |
| 3003 ts | | 541.1 | 554.7 | 565.9 | 566.2 | 591.7 | |
| 3004 ts | | 552.5 | 560.4 | 545.2 | 543.8 | 560.4 | |
| 3005 ts | | 556.7 | 565.3 | 572.4 | 577.5 | 581.1 | |
| 3006 ts | | 531.8 | 560.2 | 572.6 | 574.8 | 583.6 | |
| 3007 ts | | 511.1 | 524.3 | 527.5 | 527.3 | 546.1 | |
| 3008 ts | | 464.2 | 472.6 | 478.1 | 477.3 | 488.5 | |
| 3009 ts | | 557.1 | 566.7 | 575.3 | 578.0 | 598.3 | 610.7 |
| 3010 ts | | 618.9 | 646.3 | 650.4 | 649.8 | 669.0 | 673.8 |
| 3011 ts | | 518.7 | 522.5 | 533.9 | 544.7 | 552.2 | 569.1 |
| 3012 ts | | 563.3 | 583.8 | 589.0 | 592.4 | 603.1 | 623.3 |
| 3013 ts | | 502.7 | 516.2 | 523.4 | 519.2 | 531.4 | 538.3 |
| 3014 ts | | 602.6 | 631.7 | 642.2 | 626.4 | 644.8 | 664.4 |
| 3015 ts | | 446.2 | 453.6 | 472.7 | 608.7 | 471.7 | 480.5 |
| 3016 ts | | 576.3 | 583.0 | 589.3 | 608.6 | 620.9 | 637.4 |
| 3017 ts | | 667.7 | 690.1 | 714.3 | 716.9 | 730.2 | 753.1 |
| 3018 ts | | 669.4 | 690.2 | 710.9 | 724.6 | 745.1 | 754.9 |
| 3019 ts | | 587.7 | 607.1 | 612.6 | 638.5 | 649.8 | 660.7 |
| 3020 ts | | 641.7 | 652.4 | 662.5 | 668.2 | 684.6 | 704.0 |
| 3021 ts | | 577.2 | 582.8 | 589.5 | 589.9 | 608.7 | 622.7 |
| 3022 ts | | 555.4 | 562.6 | 579.1 | 588.1 | 606.4 | 603.3 |
| 3023 ts | | 526.9 | 540.0 | 540.5 | 532.2 | 541.0 | 556.4 |
| 3024 ts | | 560.6 | 572.1 | 570.1 | 584.1 | 601.1 | 612.5 |
| 3025 ts | | 567.2 | 578.7 | 594.0 | 593.5 | 606.9 | 620.1 |

ts = terminal sacrifice, u4 = humane euthanasia

| Males | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal | Phase | COH | | PMT | | | |
|---|---|---|---|---|---|---|---|
| Number | Week | 1 | 2 | 1 | 2 | 3 | 4 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | |
| 3026 ts | | 492.0 | 511.0 | 508.5 | 510.2 | 516.9 | 532.2 |
| Mean | | 555.8 | 569.9 | 577.8 | 586.9 | 594.8 | 623.2 |
| SD | | 56.26 | 59.53 | 62.43 | 60.57 | 67.64 | 72.98 |
| N | | 25 | 25 | 25 | 25 | 25 | 18 |

ts = terminal sacrifice

| Males | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | COH 1 | COH 2 | PMT 1 | PMT 2 | PMT 3 | PMT 4 |
|---|---|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | | | |
| 4001 ts | | 519.1 | 543.2 | 548.6 | 545.0 | 556.1 | |
| 4002 ts | | 561.6 | 581.6 | 587.8 | 593.7 | 593.6 | |
| 4003 ts | | 622.6 | 637.1 | 660.0 | 642.7 | 647.5 | |
| 4004 ts | | 506.6 | 517.9 | 533.2 | 543.5 | 559.9 | |
| 4005 ts | | 534.4 | 551.5 | 551.2 | 555.6 | 565.5 | |
| 4006 ts | | 521.0 | 545.1 | 531.0 | 535.3 | 535.8 | |
| 4007 ts | | 489.0 | 504.8 | 510.5 | 504.8 | 517.7 | |
| 4008 ts | | 543.3 | 548.4 | 544.7 | 554.9 | 567.2 | |
| 4009 ts | | 638.9 | 654.1 | 671.0 | 685.8 | 698.6 | 712.7 |
| 4010 ts | | 573.8 | 582.3 | 599.4 | 592.3 | 592.6 | 611.6 |
| 4011 ts | | 716.5 | 731.4 | 744.1 | 760.3 | 772.0 | 795.3 |
| 4012 ts | | 585.7 | 600.4 | 604.0 | 611.0 | 631.5 | 649.9 |
| 4013 ts | | 488.7 | 491.4 | 504.1 | 505.4 | 506.4 | 520.0 |
| 4014 ts | | 527.2 | 531.6 | 538.4 | 540.2 | 546.6 | 552.1 |
| 4015 ts | | 612.3 | 624.5 | 625.2 | 620.8 | 641.0 | 664.0 |
| 4016 ts | | 545.1 | 553.1 | 560.1 | 567.9 | 576.7 | 590.0 |
| 4017 ts | | 617.6 | 621.3 | 630.7 | 637.0 | 659.7 | 688.0 |
| 4018 ts | | 522.7 | 527.5 | 526.9 | 537.4 | 553.3 | 564.2 |
| 4019 ts | | 505.8 | 515.3 | 553.6 | 519.2 | 530.3 | 543.4 |
| 4020 ts | | 531.8 | 549.6 | 552.7 | 564.2 | 580.7 | 594.1 |
| 4021 ts | | 606.6 | 612.8 | 623.9 | 633.0 | 636.7 | 664.5 |
| 4022 ts | | 669.5 | 694.0 | 707.2 | 723.9 | 749.1 | 770.0 |
| 4023 ts | | 506.4 | 511.3 | 516.1 | 521.1 | 540.1 | 550.5 |
| 4024 ts | | 550.7 | 553.8 | 557.8 | 575.7 | 595.2 | 610.8 |
| 4025 ts | | 563.1 | 575.1 | 592.8 | 579.1 | 577.5 | 600.1 |

ts = terminal sacrifice

| Males | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal | Phase | COH | | PMT | | | |
|---|---|---|---|---|---|---|---|
| Number | Week | 1 | 2 | 1 | 2 | 3 | 4 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | |
| 4026 ts | | 573.7 | 585.0 | 589.9 | 602.8 | 604.5 | 622.5 |
| Mean | | 562.8 | 574.8 | 583.3 | 586.6 | 597.5 | 628.0 |
| SD | | 57.33 | 59.09 | 61.49 | 64.72 | 66.85 | 76.95 |
| N | | 26 | 26 | 26 | 26 | 26 | 18 |

ts = terminal sacrifice

| Females | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | PRE 2 | PRC 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | |
| 1501 | | 147.6 | 164.6 | 186.6 | 204.9 | 216.9 | 229.1 | 241.6 | 245.1 | 248.5 | 251.6 | 260.6 | 259.8 |
| 1502 | | 157.4 | 173.2 | 193.9 | 211.4 | 227.0 | 244.7 | 253.6 | 258.5 | 269.6 | 283.4 | 284.7 | 282.1 |
| 1503 | | 152.5 | 170.8 | 188.9 | 207.9 | 225.6 | 244.7 | 252.6 | 260.0 | 265.9 | 280.5 | 279.9 | 280.9 |
| 1504 | | 169.8 | 190.6 | 221.8 | 242.6 | 265.7 | 277.1 | 291.6 | 297.3 | 310.5 | 317.5 | 318.6 | 321.4 |
| 1505 | | 162.9 | 185.6 | 206.5 | 233.9 | 253.4 | 267.4 | 280.8 | 293.1 | 301.8 | 306.0 | 318.0 | 315.9 |
| 1506 | | 141.4 | 158.9 | 178.0 | 199.3 | 216.3 | 222.1 | 234.1 | 242.7 | 246.3 | 254.2 | 258.5 | 262.2 |
| 1507 | | 147.9 | 167.7 | 199.7 | 225.0 | 242.7 | 260.9 | 270.6 | 278.4 | 282.1 | 296.5 | 296.5 | 302.1 |
| 1508 | | 153.6 | 167.4 | 197.2 | 214.9 | 234.8 | 241.1 | 250.2 | 259.7 | 260.8 | 264.6 | 265.3 | 271.0 |
| 1509 | | 154.0 | 172.6 | 189.8 | 205.8 | 229.1 | 239.2 | 247.4 | 251.4 | 261.1 | 269.1 | 269.2 | 269.3 |
| 1510 | | 157.9 | 178.0 | 203.4 | 223.0 | 243.6 | 254.0 | 259.1 | 269.9 | 277.9 | 284.9 | 282.7 | 287.6 |
| 1511 | | 154.4 | 171.4 | 194.7 | 207.3 | 223.7 | 239.5 | 240.5 | 254.0 | 262.1 | 277.2 | 279.0 | 276.9 |
| 1512 | | 147.0 | 166.7 | 190.6 | 208.2 | 224.8 | 232.7 | 240.3 | 250.3 | 259.2 | 271.0 | 268.3 | 268.1 |
| 1513 | | 153.6 | 173.6 | 200.5 | 225.1 | 243.1 | 257.7 | 266.0 | 288.7 | 289.4 | 299.1 | 298.1 | 308.1 |
| 1514 | | 153.6 | 171.8 | 205.9 | 230.8 | 248.7 | 264.5 | 275.4 | 287.1 | 292.7 | 302.8 | 301.8 | 299.9 |
| 1515 | | 139.8 | 157.8 | 186.5 | 205.7 | 218.8 | 227.3 | 228.2 | 234.9 | 240.7 | 249.3 | 254.0 | 254.3 |
| 1516 | | 154.3 | 172.4 | 190.0 | 205.7 | 217.5 | 224.9 | 235.5 | 241.9 | 247.4 | 244.8 | 244.9 | 249.0 |
| 1517 | | 156.6 | 174.5 | 199.6 | 221.6 | 244.3 | 251.1 | 267.4 | 273.5 | 285.0 | 288.4 | 282.8 | 288.3 |
| 1518 | | 161.0 | 173.2 | 201.9 | 228.1 | 245.9 | 253.5 | 262.5 | 276.5 | 291.0 | 285.4 | 289.6 | 298.6 |
| 1519 | | 146.3 | 167.8 | 193.9 | 215.4 | 230.6 | 247.0 | 253.1 | 261.0 | 267.1 | 276.0 | 273.3 | 277.7 |
| 1520 | | 153.5 | 174.2 | 199.7 | 213.6 | 232.4 | 244.0 | 250.5 | 260.7 | 268.1 | 267.4 | 270.1 | 275.1 |
| 1521 | | 147.7 | 169.1 | 193.9 | 214.2 | 233.2 | 247.9 | 251.7 | 255.2 | 267.8 | 270.9 | 274.0 | 278.3 |
| 1522 | | 154.0 | 171.7 | 191.7 | 216.2 | 224.5 | 237.6 | 246.9 | 255.1 | 258.6 | 260.0 | 264.1 | 264.4 |
| 1523 | | 147.1 | 165.1 | 192.6 | 212.0 | 233.5 | 249.1 | 258.9 | 270.7 | 280.5 | 290.8 | 287.0 | 288.4 |
| 1524 | | 145.4 | 161.4 | 181.1 | 196.4 | 214.7 | 225.1 | 233.5 | 234.2 | 242.6 | 251.8 | 244.3 | 251.8 |
| 1525 | | 148.3 | 168.8 | 195.2 | 214.6 | 233.6 | 242.7 | 250.4 | 258.2 | 269.1 | 274.5 | 276.4 | 273.6 |

| Females | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | PRE 2 | PRC 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | |
| 1526 | | 152.3 | 173.3 | 196.6 | 218.7 | 232.7 | 247.3 | 259.1 | 270.4 | 272.7 | 281.5 | 284.8 | 288.0 |
| Mean | | 152.3 | 170.9 | 195.4 | 215.5 | 233.0 | 245.1 | 253.9 | 262.6 | 269.9 | 276.9 | 277.9 | 280.5 |
| SD | | 6.58 | 7.06 | 8.81 | 10.94 | 12.64 | 13.76 | 15.27 | 17.18 | 18.10 | 18.79 | 19.01 | 19.07 |
| N | | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |

| Females | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | PRE 2 | PRC 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | |
| 2501 | | 147.0 | 167.9 | 196.0 | 221.9 | 237.6 | 252.6 | 267.4 | 275.9 | 278.1 | 283.2 | 293.4 | 292.4 |
| 2502 | | 152.7 | 171.3 | 188.0 | 204.6 | 226.1 | 234.8 | 248.2 | 246.7 | 251.3 | 265.5 | 267.0 | 266.6 |
| 2503 | | 152.7 | 172.5 | 193.0 | 211.6 | 220.0 | 244.0 | 252.2 | 251.5 | 266.1 | 265.6 | 268.7 | 274.3 |
| 2504 | | 167.0 | 190.7 | 218.1 | 246.6 | 263.1 | 281.0 | 305.6 | 310.4 | 319.9 | 323.1 | 330.9 | 328.1 |
| 2505 | | 154.1 | 177.4 | 202.3 | 224.5 | 247.9 | 261.0 | 274.7 | 275.1 | 283.9 | 293.0 | 289.7 | 292.4 |
| 2506 | | 151.0 | 165.1 | 186.1 | 206.5 | 226.4 | 234.3 | 247.1 | 257.4 | 267.5 | 265.9 | 269.4 | 274.7 |
| 2507 | | 148.4 | 163.5 | 187.5 | 205.9 | 221.6 | 232.3 | 247.1 | 246.3 | 258.1 | 265.4 | 268.5 | 269.2 |
| 2508 | | 142.2 | 159.4 | 182.9 | 203.1 | 228.6 | 236.3 | 242.5 | 250.0 | 260.4 | 261.9 | 264.9 | 266.6 |
| 2509 | | 151.6 | 173.5 | 202.0 | 220.6 | 239.5 | 252.4 | 262.2 | 271.5 | 270.4 | 277.5 | 285.1 | 281.3 |
| 2510 | | 147.8 | 163.6 | 189.6 | 205.2 | 224.2 | 236.5 | 244.9 | 247.9 | 253.6 | 257.9 | 262.0 | 260.1 |
| 2511 | | 149.7 | 173.0 | 198.6 | 218.6 | 242.3 | 251.2 | 266.5 | 274.5 | 279.0 | 287.9 | 297.2 | 297.5 |
| 2512 | | 143.0 | 161.8 | 176.5 | 192.7 | 209.8 | 221.6 | 230.0 | 240.1 | 249.5 | 256.0 | 256.9 | 262.0 |
| 2513 | | 159.2 | 185.6 | 213.4 | 235.2 | 254.3 | 266.1 | 276.1 | 276.4 | 285.1 | 298.6 | 296.2 | 294.0 |
| 2514 | | 156.5 | 176.7 | 195.8 | 211.1 | 235.8 | 250.0 | 260.2 | 262.5 | 266.7 | 277.5 | 282.0 | 279.9 |
| 2515 | | 160.4 | 179.9 | 207.3 | 230.9 | 246.3 | 262.7 | 269.0 | 278.1 | 287.7 | 278.6 | 292.8 | 296.9 |
| 2516 | | 148.4 | 165.7 | 196.0 | 219.9 | 234.0 | 241.1 | 254.8 | 267.6 | 268.8 | 289.7 | 296.2 | 291.9 |
| 2517 | | 143.7 | 161.5 | 184.5 | 203.7 | 216.8 | 223.6 | 232.7 | 240.3 | 247.7 | 254.8 | 258.2 | 260.9 |
| 2518 | | 145.3 | 165.3 | 188.7 | 211.0 | 232.0 | 247.1 | 250.7 | 256.1 | 272.8 | 277.9 | 277.8 | 279.5 |
| 2519 | | 140.2 | 156.9 | 180.0 | 198.2 | 211.8 | 224.8 | 237.5 | 241.7 | 248.6 | 252.1 | 255.6 | 266.0 |
| 2520 | | 151.9 | 171.8 | 198.2 | 218.7 | 237.4 | 248.5 | 254.8 | 264.3 | 274.5 | 277.6 | 279.2 | 283.1 |
| 2521 | | 144.8 | 163.2 | 189.6 | 209.1 | 226.0 | 235.8 | 241.6 | 250.1 | 258.8 | 255.3 | 263.9 | 268.6 |
| 2522 | | 152.9 | 174.6 | 201.6 | 226.3 | 238.9 | 262.0 | 280.1 | 281.8 | 285.5 | 297.3 | 303.4 | 302.3 |
| 2523 | | 135.0 | 150.4 | 173.0 | 194.6 | 215.1 | 223.9 | 231.3 | 240.6 | 250.6 | 252.8 | 257.8 | 257.8 |
| 2524 | | 157.6 | 181.5 | 207.0 | 226.7 | 250.2 | 259.2 | 270.4 | 273.9 | 282.5 | 282.9 | 288.9 | 295.4 |
| 2525 | | 155.3 | 180.1 | 209.9 | 229.5 | 259.2 | 276.7 | 282.1 | 282.3 | 291.0 | 301.7 | 303.3 | 299.1 |

| Females | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | PRE 2 | PRC 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | |
| 2526 | | 159.9 | 180.0 | 207.0 | 218.4 | 237.8 | 249.0 | 262.7 | 258.1 | 264.4 | 279.2 | 279.3 | 277.6 |
| Mean | | 150.7 | 170.5 | 195.1 | 215.2 | 234.0 | 246.5 | 257.4 | 262.4 | 270.1 | 276.1 | 280.3 | 281.5 |
| SD | | 7.16 | 9.50 | 11.49 | 13.06 | 14.23 | 16.06 | 17.99 | 17.17 | 16.77 | 17.82 | 18.44 | 16.79 |
| N | | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |

| Females | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | PRE 2 | PRC 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | |
| 3501 | | 163.9 | 177.0 | 202.3 | 226.7 | 243.2 | 250.9 | 260.7 | 274.1 | 287.6 | 287.1 | 290.3 | 295.4 |
| 3502 | | 141.0 | 152.3 | 176.0 | 192.6 | 200.7 | 210.7 | 222.9 | 231.5 | 237.1 | 239.9 | 249.9 | 251.5 |
| 3503 | | 143.0 | 159.1 | 183.3 | 200.8 | 216.9 | 231.3 | 236.0 | 233.9 | 243.5 | 257.7 | 263.9 | 257.9 |
| 3504 | | 148.5 | 165.8 | 190.5 | 214.9 | 232.9 | 247.4 | 251.7 | 262.7 | 272.5 | 274.9 | 283.9 | 283.3 |
| 3505 | | 165.4 | 189.4 | 217.5 | 196.5 | 258.8 | 277.5 | 282.1 | 291.8 | 301.9 | 308.5 | 309.9 | 317.2 |
| 3506 | | 143.9 | 161.5 | 180.7 | 215.4 | 208.6 | 228.0 | 237.7 | 239.2 | 256.6 | 265.0 | 266.1 | 257.9 |
| 3507 | | 150.0 | 166.6 | 192.1 | 193.3 | 230.1 | 242.1 | 249.7 | 255.5 | 269.0 | 265.8 | 272.9 | 275.5 |
| 3508 | | 141.0 | 158.5 | 175.2 | 193.2 | 201.4 | 213.2 | 216.4 | 221.6 | 232.0 | 230.9 | 233.8 | 233.2 |
| 3509 | | 160.8 | 177.3 | 203.5 | 227.0 | 239.2 | 252.4 | 265.9 | 274.6 | 283.6 | 284.9 | 295.4 | 294.3 |
| 3510 | | 151.0 | 171.3 | 196.5 | 221.1 | 238.5 | 255.0 | 268.2 | 271.6 | 279.1 | 286.6 | 290.4 | 284.3 |
| 3511 | | 140.9 | 157.2 | 180.6 | 197.8 | 202.5 | 210.9 | 223.1 | 227.7 | 236.5 | 239.9 | 245.8 | 246.1 |
| 3512 | | 164.9 | 187.6 | 212.9 | 231.6 | 250.2 | 272.4 | 287.9 | 293.2 | 304.3 | 321.3 | 329.6 | 321.0 |
| 3513 | | 154.6 | 177.0 | 211.7 | 233.0 | 249.3 | 269.3 | 283.0 | 286.9 | 296.4 | 303.8 | 310.7 | 314.1 |
| 3514 | | 142.6 | 158.2 | 186.2 | 204.2 | 221.1 | 235.1 | 244.0 | 258.2 | 259.8 | 273.3 | 266.1 | 278.9 |
| 3515 | | 154.9 | 171.1 | 198.7 | 233.1 | 229.1 | 242.4 | 248.3 | 249.8 | 252.9 | 257.4 | 272.1 | 264.0 |
| 3516 | | 144.0 | 170.9 | 198.9 | 215.8 | 233.5 | 248.9 | 256.7 | 259.5 | 269.8 | 278.3 | 281.5 | 280.9 |
| 3517 ts | | 156.1 | 171.5 | 196.1 | 219.8 | 234.8 | 246.7 | 255.8 | 260.0 | 275.3 | 281.1 | 288.6 | 293.5 |
| 3518 | | 156.7 | 178.7 | 213.9 | 239.3 | 256.6 | 276.1 | 284.6 | 281.9 | 297.8 | 304.7 | 308.2 | 312.3 |
| 3519 | | 152.5 | 166.4 | 194.8 | 212.5 | 229.2 | 240.2 | 251.5 | 259.9 | 269.8 | 276.5 | 263.5 | 278.5 |
| 3520 | | 158.5 | 183.7 | 222.8 | 249.4 | 275.2 | 285.4 | 301.0 | 313.0 | 325.4 | 331.1 | 341.2 | 342.9 |
| 3521 | | 137.0 | 156.5 | 175.6 | 190.2 | 204.1 | 212.1 | 220.4 | 221.2 | 236.9 | 252.8 | 253.1 | 246.5 |
| 3522 | | 145.8 | 163.0 | 186.7 | 209.6 | 229.3 | 235.9 | 252.3 | 255.5 | 261.8 | 265.2 | 268.9 | 265.8 |
| 3523 | | 141.1 | 160.7 | 190.9 | 203.7 | 222.1 | 236.4 | 246.0 | 251.1 | 265.5 | 273.3 | 269.6 | 272.0 |
| 3524 | | 134.0 | 151.6 | 176.8 | 194.0 | 208.6 | 222.8 | 239.6 | 241.3 | 250.5 | 260.2 | 259.0 | 259.8 |
| 3525 | | 159.1 | 180.6 | 207.9 | 225.8 | 241.9 | 254.6 | 259.4 | 260.2 | 270.5 | 275.1 | 281.1 | 277.6 |

ts = terminal sacrifice

| Females | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | PRE 2 | PRC 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | |
| 3526 | | 161.6 | 182.0 | 214.2 | 237.6 | 254.5 | 265.3 | 274.8 | 279.7 | 293.0 | 301.4 | 306.5 | 305.9 |
| Mean | | 150.5 | 169.1 | 195.6 | 214.6 | 231.2 | 244.7 | 254.6 | 259.8 | 270.4 | 276.8 | 280.8 | 281.2 |
| SD | | 9.24 | 10.91 | 14.31 | 17.08 | 19.77 | 21.36 | 22.15 | 23.32 | 23.97 | 24.64 | 25.85 | 26.63 |
| N | | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |

| Females | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | PRE 2 | PRC 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | |
| 4501 | | 151.0 | 170.3 | 200.0 | 217.8 | 228.2 | 244.3 | 261.4 | 260.3 | 274.3 | 275.5 | 282.2 | 286.0 |
| 4502 | | 146.6 | 167.9 | 196.7 | 212.6 | 232.5 | 251.1 | 263.8 | 264.4 | 271.8 | 277.3 | 281.6 | 276.0 |
| 4503 | | 159.7 | 181.2 | 204.5 | 222.0 | 237.3 | 257.3 | 266.6 | 274.7 | 278.8 | 287.4 | 295.8 | 294.0 |
| 4504 | | 159.1 | 163.1 | 202.8 | 224.0 | 240.5 | 251.0 | 251.1 | 262.5 | 270.4 | 268.9 | 266.3 | 270.9 |
| 4505 | | 142.3 | 163.2 | 200.2 | 222.2 | 239.2 | 257.9 | 263.7 | 270.7 | 284.4 | 295.9 | 294.7 | 296.1 |
| 4506 | | 136.9 | 154.8 | 173.4 | 189.5 | 204.1 | 206.4 | 216.8 | 228.3 | 233.1 | 240.9 | 242.8 | 248.8 |
| 4507 | | 143.1 | 159.2 | 174.4 | 197.5 | 208.0 | 224.5 | 225.9 | 231.2 | 240.4 | 250.0 | 255.6 | 251.9 |
| 4508 | | 147.9 | 164.0 | 189.8 | 208.8 | 224.7 | 247.2 | 253.6 | 258.4 | 272.3 | 277.0 | 284.6 | 292.7 |
| 4509 | | 160.8 | 186.3 | 217.3 | 232.7 | 246.6 | 251.5 | 260.6 | 272.2 | 274.8 | 280.0 | 285.8 | 282.5 |
| 4510 | | 160.7 | 181.9 | 204.6 | 229.1 | 246.5 | 258.6 | 274.1 | 284.0 | 290.1 | 294.5 | 305.8 | 304.1 |
| 4511 | | 161.3 | 179.2 | 204.2 | 219.2 | 228.2 | 247.0 | 259.8 | 270.7 | 272.6 | 278.2 | 288.3 | 289.9 |
| 4512 | | 144.6 | 161.4 | 186.3 | 197.4 | 219.1 | 234.8 | 245.1 | 250.3 | 259.3 | 271.2 | 276.0 | 268.8 |
| 4513 | | 136.9 | 156.2 | 177.7 | 193.7 | 207.3 | 217.9 | 227.2 | 236.6 | 241.7 | 245.3 | 253.2 | 253.3 |
| 4514 | | 155.9 | 175.6 | 205.2 | 218.8 | 237.8 | 254.7 | 261.2 | 264.7 | 270.8 | 281.1 | 295.2 | 299.2 |
| 4515 | | 159.9 | 183.0 | 196.6 | 223.6 | 246.3 | 261.9 | 266.9 | 289.5 | 296.2 | 295.9 | 312.6 | 304.9 |
| 4516 | | 135.9 | 155.3 | 179.6 | 200.5 | 219.8 | 234.5 | 238.7 | 251.9 | 263.5 | 264.4 | 265.0 | 267.3 |
| 4517 | | 142.3 | 159.6 | 188.7 | 205.3 | 218.2 | 232.7 | 238.8 | 251.1 | 255.8 | 259.3 | 265.4 | 268.8 |
| 4518 | | 164.1 | 184.3 | 208.2 | 226.6 | 244.2 | 261.9 | 266.3 | 278.6 | 288.5 | 293.3 | 295.8 | 302.1 |
| 4519 | | 155.8 | 174.4 | 208.9 | 230.8 | 248.1 | 256.4 | 271.9 | 275.2 | 272.5 | 283.7 | 292.8 | 295.5 |
| 4520 | | 162.2 | 185.0 | 212.9 | 229.2 | 252.2 | 265.6 | 276.9 | 279.7 | 285.1 | 296.1 | 294.5 | 293.3 |
| 4521 | | 141.3 | 159.9 | 183.2 | 202.1 | 216.4 | 227.6 | 233.9 | 247.5 | 253.6 | 257.0 | 261.2 | 266.5 |
| 4522 | | 147.8 | 171.2 | 196.0 | 213.0 | 232.1 | 247.9 | 251.0 | 256.6 | 263.5 | 275.7 | 283.4 | 278.9 |
| 4523 | | 140.9 | 157.9 | 182.6 | 195.5 | 206.9 | 222.6 | 231.9 | 234.3 | 241.1 | 249.7 | 251.0 | 251.4 |
| 4524 | | 149.4 | 165.7 | 193.4 | 209.3 | 223.0 | 233.6 | 246.3 | 253.1 | 262.1 | 262.1 | 266.1 | 269.9 |
| 4525 | | 151.6 | 175.4 | 209.8 | 232.5 | 251.5 | 263.3 | 275.6 | 288.8 | 292.7 | 297.9 | 309.9 | 310.2 |

| Females | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | PRE 2 | PRC 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | |
| 4526 | | 139.4 | 161.4 | 186.3 | 201.7 | 223.9 | 232.5 | 235.6 | 240.9 | 249.8 | 257.3 | 259.1 | 256.3 |
| Mean | | 149.9 | 169.1 | 195.5 | 213.7 | 230.1 | 244.0 | 252.5 | 260.6 | 267.7 | 273.7 | 279.4 | 280.0 |
| SD | | 9.13 | 10.37 | 12.38 | 13.39 | 14.82 | 15.83 | 17.03 | 17.59 | 17.20 | 17.15 | 19.23 | 18.76 |
| N | | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |

| Females | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal | Phase | COH | | PMT | | | |
|---|---|---|---|---|---|---|---|
| Number | Week | 1 | 2 | 1 | 2 | 3 | 4 |
| Group 1 - 0 mg/m$^3$ | | | | | | | |
| 1501 | | | | | | | |
| 1502 | | | | | | | |
| 1503 | | | | | | | |
| 1504 | | 339.1 | 353.1 | | | | |
| 1505 | | | | | | | |
| 1506 | | | | | | | |
| 1507 | | | | | | | |
| 1508 | | | | | | | |
| 1509 | | | | | | | |
| 1510 | | | | | | | |
| 1511 | | | | | | | |
| 1512 | | | | | | | |
| 1513 | | | | | | | |
| 1514 | | | | | | | |
| 1515 | | | | | | | |
| 1516 | | | | | | | |
| 1517 | | | | | | | |
| 1518 | | | | | | | |
| 1519 | | | | | | | |
| 1520 | | | | | | | |
| 1521 | | | | | | | |
| 1522 | | | | | | | |
| 1523 | | | | | | | |
| 1524 | | | | | | | |
| 1525 | | | | | | | |

| Females | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal | Phase | COH | | PMT | | | |
|---|---|---|---|---|---|---|---|
| Number | Week | 1 | 2 | 1 | 2 | 3 | 4 |
| Group 1 - 0 mg/m$^3$ | | | | | | | |
| 1526 | | | | | | | |
| Mean | | 339.1 | 353.1 | | | | |
| SD | | | | | | | |
| N | | 1 | 1 | | | | |

| Females | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal | Phase | COH | | PMT | | | |
|---|---|---|---|---|---|---|---|
| Number | Week | 1 | 2 | 1 | 2 | 3 | 4 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | |
| 2501 | | | | | | | |
| 2502 | | | | | | | |
| 2503 | | | | | | | |
| 2504 | | | | | | | |
| 2505 | | | | | | | |
| 2506 | | | | | | | |
| 2507 | | | | | | | |
| 2508 | | | | | | | |
| 2509 | | | | | | | |
| 2510 | | | | | | | |
| 2511 | | | | | | | |
| 2512 | | | | | | | |
| 2513 | | | | | | | |
| 2514 | | | | | | | |
| 2515 | | | | | | | |
| 2516 | | | | | | | |
| 2517 | | | | | | | |
| 2518 | | | | | | | |
| 2519 | | | | | | | |
| 2520 | | | | | | | |
| 2521 | | | | | | | |
| 2522 | | | | | | | |
| 2523 | | | | | | | |
| 2524 | | 330.6 | 350.2 | | | | |
| 2525 | | | | | | | |

| Females | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | COH 1 | COH 2 | PMT 1 | PMT 2 | PMT 3 | PMT 4 |
|---|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | | |
| 2526 | | | | | | | |
| Mean | | 330.6 | 350.2 | | | | |
| SD | | | | | | | |
| N | | 1 | 1 | | | | |

| Females | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal | Phase | COH | | PMT | | | |
|---|---|---|---|---|---|---|---|
| Number | Week | 1 | 2 | 1 | 2 | 3 | 4 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | |
| 3501 | | | | | | | |
| 3502 | | | | | | | |
| 3503 | | | | | | | |
| 3504 | | | | | | | |
| 3505 | | | | | | | |
| 3506 | | | | | | | |
| 3507 | | | | | | | |
| 3508 | | | | | | | |
| 3509 | | | | | | | |
| 3510 | | | | | | | |
| 3511 | | | | | | | |
| 3512 | | | | | | | |
| 3513 | | | | | | | |
| 3514 | | | | | | | |
| 3515 | | 284.8 | 296.8 | | | | |
| 3516 | | | | | | | |
| 3517 ts | | 307.8 | 313.0 | 313.2 | 311.4 | 314.9 | 318.7 |
| 3518 | | | | | | | |
| 3519 | | | | | | | |
| 3520 | | | | | | | |
| 3521 | | | | | | | |
| 3522 | | | | | | | |
| 3523 | | | | | | | |
| 3524 | | | | | | | |
| 3525 | | | | | | | |

ts = terminal sacrifice

| Females | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | COH 1 | COH 2 | PMT 1 | PMT 2 | PMT 3 | PMT 4 |
|---|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | | |
| 3526 | | | | | | | |
| Mean | | 296.3 | 304.9 | 313.2 | 311.4 | 314.9 | 318.7 |
| SD | | 16.26 | 11.46 | | | | |
| N | | 2 | 2 | 1 | 1 | 1 | 1 |

| Females | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | COH 1 | COH 2 | PMT 1 | PMT 2 | PMT 3 | PMT 4 |
|---|---|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | | | |
| 4501 | | | | | | | |
| 4502 | | | | | | | |
| 4503 | | | | | | | |
| 4504 | | | | | | | |
| 4505 | | | | | | | |
| 4506 | | | | | | | |
| 4507 | | | | | | | |
| 4508 | | | | | | | |
| 4509 | | | | | | | |
| 4510 | | | | | | | |
| 4511 | | | | | | | |
| 4512 | | | | | | | |
| 4513 | | | | | | | |
| 4514 | | | | | | | |
| 4515 | | | | | | | |
| 4516 | | | | | | | |
| 4517 | | | | | | | |
| 4518 | | | | | | | |
| 4519 | | | | | | | |
| 4520 | | | | | | | |
| 4521 | | | | | | | |
| 4522 | | | | | | | |
| 4523 | | | | | | | |
| 4524 | | | | | | | |
| 4525 | | | | | | | |

| Females | Body weight during premating, mating and postmating periods - individual values (grams) | Appendix 5 |
|---|---|---|

| Animal Number | Phase / Week | COH 1 | COH 2 | PMT 1 | PMT 2 | PMT 3 | PMT 4 |
|---|---|---|---|---|---|---|---|

Group 4 - 20,000 mg/$m^3$

4526

Mean
SD
N

| Males | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal | Phase | PRE-PRC | PRC | | | | | | | | | | PRC-COH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | Week | 2-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-1 |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | |
| 1001 ts | | 40.1 | 61.4 | 62.1 | 40.8 | 40.8 | 33.7 | 21.5 | 18.6 | 15.2 | 11.9 | 16.8 | 15.2 |
| 1002 ts | | 51.1 | 66.8 | 67.5 | 50.5 | 41.3 | 34.7 | 30.4 | 14.0 | 9.3 | 11.3 | 16.2 | 15.7 |
| 1003 ts | | 41.0 | 60.0 | 54.8 | 43.0 | 36.6 | 31.3 | 30.0 | 19.0 | 19.8 | 12.7 | 20.2 | 21.1 |
| 1004 ts | | 35.6 | 59.1 | 56.7 | 56.0 | 30.8 | 37.0 | 33.9 | 25.2 | 23.8 | 6.5 | 6.7 | 23.6 |
| 1005 ts | | 45.3 | 61.9 | 46.4 | 45.9 | 47.5 | 18.3 | 21.8 | 15.4 | 17.7 | 5.6 | 12.7 | 28.0 |
| 1006 ts | | 39.7 | 48.6 | 46.8 | 42.5 | 36.3 | 21.0 | 21.3 | 15.6 | 22.5 | 9.4 | 16.8 | 20.0 |
| 1007 ts | | 39.0 | 53.0 | 50.8 | 40.7 | 41.4 | 35.8 | 26.1 | 27.0 | 19.8 | 14.1 | 11.8 | 13.3 |
| 1008 ts | | 48.5 | 63.2 | 58.1 | 45.4 | 41.8 | 32.6 | 22.4 | 25.6 | 27.1 | 15.4 | 15.2 | 9.2 |
| 1009 ts | | 45.3 | 57.7 | 61.1 | 53.2 | 45.6 | 28.7 | 25.6 | 21.7 | 18.2 | 20.8 | 13.4 | 20.2 |
| 1010 ts | | 46.4 | 65.1 | 67.5 | 45.8 | 43.3 | 29.4 | 29.8 | 25.5 | 20.5 | 21.8 | 22.5 | 1.4 |
| 1011 ts | | 35.1 | 50.5 | 45.2 | 32.0 | 28.7 | 22.1 | 21.9 | 14.8 | 19.2 | 6.8 | 16.9 | 10.7 |
| 1012 ts | | 41.6 | 55.6 | 50.6 | 48.1 | 44.2 | 29.0 | 26.1 | 23.6 | 26.0 | 12.8 | 10.9 | 29.2 |
| 1013 ts | | 45.7 | 65.3 | 67.7 | 49.4 | 37.4 | 34.4 | 23.4 | 18.3 | 21.9 | 12.9 | 18.9 | 10.9 |
| 1014 ts | | 45.3 | 61.2 | 64.6 | 55.9 | 39.0 | 43.0 | 31.7 | 28.5 | 28.5 | 10.5 | 26.1 | 13.2 |
| 1015 ts | | 41.6 | 69.5 | 58.1 | 51.8 | 23.9 | 35.0 | 23.5 | 20.3 | 23.7 | 12.0 | 15.9 | 10.7 |
| 1016 ts | | 42.7 | 58.5 | 60.2 | 54.2 | 37.8 | 41.6 | 23.2 | 30.2 | 21.1 | 14.1 | 12.7 | 17.9 |
| 1017 ts | | 31.0 | 50.1 | 41.7 | 33.1 | 34.3 | 23.0 | 23.0 | 22.5 | 16.5 | 25.2 | 12.6 | 11.1 |
| 1018 ts | | 44.7 | 73.2 | 58.5 | 36.3 | 45.3 | 29.7 | 29.3 | 12.8 | 20.5 | 12.4 | 17.2 | 13.9 |
| 1019 ts | | 39.8 | 62.0 | 48.3 | 47.2 | 29.6 | 35.0 | 28.0 | 12.4 | 21.5 | 6.5 | 13.9 | 25.1 |
| 1020 ts | | 45.6 | 65.8 | 65.3 | 55.5 | 44.5 | 41.9 | 33.3 | 23.3 | 28.5 | 10.1 | 12.4 | 27.0 |
| 1021 ts | | 43.5 | 65.0 | 67.1 | 53.7 | 54.2 | 41.5 | 31.2 | 37.6 | 31.3 | 21.9 | 21.1 | 20.3 |
| 1022 ts | | 41.2 | 53.3 | 51.2 | 40.2 | 32.5 | 36.6 | 28.0 | 16.6 | 26.0 | 4.0 | 16.4 | 18.8 |
| 1023 ts | | 47.8 | 57.0 | 56.3 | 44.8 | 43.9 | 29.9 | 23.9 | 24.5 | 25.6 | 3.1 | 17.3 | -0.5 |
| 1024 ts | | 50.6 | 60.0 | 63.1 | 40.7 | 48.2 | 27.4 | 31.9 | 22.2 | 19.8 | 8.9 | 24.5 | 25.9 |
| 1025 ts | | 43.2 | 52.5 | 39.7 | 31.7 | 34.7 | 33.5 | 15.0 | 19.4 | 16.0 | 16.8 | 19.3 | 19.6 |

ts = terminal sacrifice

| Males | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal | Phase | PRE-PRC | PRC | | | | | | | | | PRC-COH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | Week | 2-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-1 |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | |
| 1026 ts | | 41.5 | 57.1 | 49.9 | 40.4 | 39.7 | 26.5 | 19.6 | 21.5 | 19.7 | 21.2 | 14.1 | 7.2 |
| Mean | | 42.8 | 59.7 | 56.1 | 45.3 | 39.4 | 32.0 | 26.0 | 21.4 | 21.5 | 12.6 | 16.3 | 16.5 |
| SD | | 4.65 | 6.19 | 8.42 | 7.37 | 6.87 | 6.56 | 4.75 | 5.88 | 4.83 | 5.86 | 4.36 | 7.77 |
| N | | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |

ts = terminal sacrifice

| Males | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal | Phase | PRE-PRC | PRC | | | | | | | | | | PRC-COH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | Week | 2-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-1 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | |
| 2001 ts | | 37.6 | 51.8 | 43.8 | 34.4 | 27.7 | 25.0 | 23.3 | 14.4 | 13.5 | 14.6 | -15.5 | 33.0 |
| 2002 ts | | 42.3 | 73.3 | 72.1 | 48.6 | 44.3 | 34.4 | 36.9 | 25.0 | 22.3 | 18.7 | -10.3 | 45.3 |
| 2003 ts | | 37.1 | 45.5 | 40.8 | 33.8 | 33.6 | 27.8 | 24.2 | 25.0 | 23.2 | 13.4 | 8.5 | 15.5 |
| 2004 ts | | 40.2 | 54.6 | 50.3 | 47.6 | 33.1 | 31.8 | 31.4 | 25.6 | 20.3 | 30.1 | 13.3 | 15.6 |
| 2005 ts | | 46.6 | 66.2 | 54.6 | 44.7 | 36.7 | 21.5 | 31.6 | 26.5 | 24.4 | 14.1 | -0.6 | 13.7 |
| 2006 ts | | 41.6 | 52.3 | 51.2 | 45.6 | 37.3 | 32.2 | 30.8 | 23.4 | 23.1 | 17.3 | 2.6 | 9.6 |
| 2007 ts | | 40.9 | 59.5 | 56.0 | 46.4 | 36.3 | 25.9 | 25.3 | 23.2 | 27.8 | 18.2 | 17.2 | 17.2 |
| 2008 ts | | 44.8 | 55.8 | 49.6 | 43.3 | 37.8 | 25.1 | 4.0 | 28.6 | 20.5 | 12.2 | 3.6 | 23.6 |
| 2009 ts | | 40.1 | 63.1 | 60.0 | 53.0 | 38.6 | 26.9 | 23.1 | 5.6 | 29.8 | 16.6 | 6.3 | 16.4 |
| 2010 ts | | 42.6 | 56.8 | 57.7 | 44.9 | 35.7 | 30.0 | -7.7 | -15.6 | 33.5 | 34.0 | 30.9 | 28.1 |
| 2011 ts | | 32.6 | 44.4 | 44.4 | 36.4 | 35.0 | 32.4 | 19.7 | 28.6 | 16.9 | 16.9 | 15.8 | 12.0 |
| 2012 ts | | 41.6 | 53.4 | 62.9 | 53.8 | 45.0 | 28.9 | 23.9 | 35.3 | 18.6 | 17.6 | 19.3 | 17.6 |
| 2013 ts | | 50.2 | 76.9 | 63.5 | 54.9 | 35.4 | 36.4 | 27.2 | 24.4 | 9.4 | 8.2 | 23.2 | 4.9 |
| 2014 ts | | 37.4 | 57.7 | 62.1 | 57.3 | 31.1 | 35.6 | 21.6 | 34.7 | 12.3 | 20.3 | 20.1 | 15.2 |
| 2015 ts | | 35.1 | 54.4 | 57.1 | 35.0 | 27.2 | 21.5 | 24.4 | 19.4 | 17.8 | 13.4 | 0.4 | 13.6 |
| 2016 ts | | 37.3 | 51.7 | 52.6 | 43.6 | 27.7 | 31.6 | 26.4 | 14.7 | 20.4 | 18.1 | 15.3 | 17.5 |
| 2017 ts | | 39.2 | 60.1 | 58.2 | 43.9 | 42.4 | 33.7 | 31.8 | 23.9 | 18.5 | 11.0 | 11.0 | 14.4 |
| 2018 ts | | 42.2 | 58.9 | 60.3 | 43.4 | 33.0 | 38.8 | 26.9 | 29.7 | 25.0 | 22.1 | 16.8 | 7.6 |
| 2019 ts | | 53.5 | 72.9 | 70.8 | 50.5 | 45.1 | 28.0 | 9.9 | 48.2 | 22.7 | 26.3 | 20.6 | 19.0 |
| 2020 ts | | 41.4 | 58.7 | 52.0 | 41.6 | 30.6 | 39.3 | 19.4 | 23.2 | 19.8 | 16.4 | 9.7 | 23.2 |
| 2021 ts | | 45.1 | 59.8 | 66.6 | 66.4 | 43.1 | 39.6 | 32.8 | 43.4 | 30.2 | 9.6 | 23.2 | 15.8 |
| 2022 ts | | 43.7 | 60.7 | 57.9 | 50.3 | 41.6 | 29.3 | 29.6 | 26.4 | 26.0 | 14.2 | 22.3 | 12.5 |
| 2023 ts | | 50.7 | 56.4 | 58.3 | 37.9 | 37.7 | 25.4 | 26.7 | 20.4 | 22.6 | 9.5 | -11.0 | 39.5 |
| 2024 ts | | 45.2 | 68.3 | 61.2 | 55.1 | 36.3 | 37.5 | 17.5 | 35.4 | 19.1 | -0.6 | 4.7 | 47.3 |
| 2025 ts | | 45.6 | 53.5 | 55.6 | 43.8 | 33.8 | 28.2 | 12.7 | 25.3 | 12.6 | 17.5 | 2.1 | 17.8 |

ts = terminal sacrifice

| Males | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal | Phase | PRE-PRC | PRC | | | | | | | | | PRC-COH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | Week | 2-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-1 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | |
| 2026 ts | | 48.0 | 49.7 | 44.0 | 32.4 | 30.8 | 20.9 | 10.7 | 15.2 | 7.7 | 15.8 | 11.6 | 6.2 |
| Mean | | 42.4 | 58.3 | 56.3 | 45.7 | 36.0 | 30.3 | 22.5 | 24.2 | 20.7 | 16.4 | 10.0 | 19.3 |
| SD | | 4.94 | 8.06 | 7.98 | 8.15 | 5.27 | 5.55 | 9.93 | 12.04 | 6.29 | 6.89 | 11.53 | 11.03 |
| N | | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |

ts = terminal sacrifice

| Males | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal | Phase | PRE-PRC | PRC | | | | | | | | | | PRC-COH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | Week | 2-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-1 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | |
| 3001 ts | | 37.7 | 55.7 | 50.6 | 41.1 | 40.7 | 28.8 | 22.3 | 16.6 | 17.3 | 14.2 | -2.5 | 4.8 |
| 3002 u4 | | 45.7 | 61.7 | 58.9 | 47.7 | 23.7 | -32.0 | | | | | | |
| 3003 ts | | 50.1 | 56.7 | 50.0 | 41.4 | 30.9 | 30.0 | 21.4 | 25.5 | 23.7 | 21.0 | 13.3 | 6.8 |
| 3004 ts | | 47.9 | 57.0 | 56.5 | 41.5 | 38.5 | 30.7 | 24.3 | 20.0 | 21.1 | 19.7 | 10.1 | 5.2 |
| 3005 ts | | 39.9 | 57.7 | 51.3 | 45.9 | 38.2 | 41.2 | 24.5 | 25.4 | 19.7 | 23.7 | 13.3 | 13.6 |
| 3006 ts | | 36.4 | 55.7 | 52.4 | 40.4 | 40.6 | 36.0 | 27.4 | 31.2 | 11.7 | 20.5 | 10.8 | 18.5 |
| 3007 ts | | 39.2 | 57.6 | 54.6 | 48.0 | 29.7 | 27.7 | 21.8 | 16.9 | 17.7 | 13.9 | 7.5 | 23.7 |
| 3008 ts | | 27.7 | 51.7 | 44.9 | 38.1 | 31.0 | 19.9 | 16.3 | 16.2 | 12.2 | 15.9 | 12.1 | 16.3 |
| 3009 ts | | 39.2 | 57.8 | 46.0 | 44.2 | 32.0 | 28.3 | 24.2 | 26.7 | 19.9 | 23.1 | 10.1 | 30.2 |
| 3010 ts | | 43.9 | 67.3 | 58.3 | 47.5 | 45.3 | 26.2 | 35.7 | 29.6 | 17.2 | 20.3 | 13.6 | 19.1 |
| 3011 ts | | 34.8 | 47.3 | 48.4 | 30.8 | 34.2 | 32.2 | 25.1 | 34.7 | 15.8 | 13.3 | 12.9 | 36.2 |
| 3012 ts | | 44.5 | 60.7 | 48.8 | 47.4 | 43.9 | 27.1 | 29.0 | 26.0 | 21.7 | 20.5 | 6.1 | 12.7 |
| 3013 ts | | 41.9 | 58.0 | 51.4 | 29.9 | 30.9 | 27.2 | 23.1 | 27.9 | 8.0 | 14.8 | 2.2 | 21.5 |
| 3014 ts | | 51.4 | 76.7 | 71.9 | 49.0 | 41.7 | 30.2 | 20.0 | 19.4 | 27.1 | 16.8 | 4.3 | 26.6 |
| 3015 ts | | 31.1 | 45.2 | 40.9 | 30.6 | 28.5 | 25.3 | 19.7 | 15.3 | 20.8 | 9.2 | 16.9 | 4.5 |
| 3016 ts | | 43.8 | 59.4 | 58.3 | 46.7 | 42.7 | 34.6 | 25.1 | 18.5 | 25.2 | 17.7 | 12.2 | 23.9 |
| 3017 ts | | 49.6 | 79.4 | 73.5 | 57.6 | 48.0 | 40.2 | 22.2 | 12.7 | 47.1 | 19.8 | 6.3 | 24.6 |
| 3018 ts | | 48.8 | 79.3 | 65.1 | 56.6 | 56.7 | 37.4 | 38.0 | 14.9 | 46.3 | 29.3 | 7.2 | 23.9 |
| 3019 ts | | 46.8 | 66.4 | 48.3 | 43.3 | 32.6 | 42.1 | 26.0 | 20.1 | 27.9 | 22.9 | 23.5 | 13.9 |
| 3020 ts | | 52.0 | 71.9 | 64.9 | 57.3 | 54.6 | 40.8 | 37.8 | 14.4 | 27.8 | 21.7 | 24.4 | 3.9 |
| 3021 ts | | 42.4 | 58.4 | 51.1 | 51.9 | 41.2 | 29.9 | 28.7 | 2.8 | 49.3 | 21.5 | 1.1 | 28.1 |
| 3022 ts | | 40.7 | 56.3 | 41.3 | 40.9 | 37.0 | 32.3 | 25.0 | 69.4 | -11.7 | 24.2 | 21.7 | 11.2 |
| 3023 ts | | 41.7 | 57.7 | 50.5 | 43.6 | 35.4 | 25.3 | 24.4 | 17.0 | 16.7 | 11.9 | 22.4 | 11.7 |
| 3024 ts | | 44.2 | 66.6 | 63.6 | 41.6 | 47.4 | 32.1 | 27.1 | 23.8 | 16.1 | 14.0 | 11.5 | 9.0 |
| 3025 ts | | 46.7 | 62.8 | 57.8 | 44.7 | 35.1 | 33.8 | 29.7 | 20.0 | 19.6 | 21.7 | 12.7 | 17.9 |

ts = terminal sacrifice, u4 = humane euthanasia

| Males | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal | Phase | PRE-PRC | PRC | | | | | | | | | | PRC-COH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | Week | 2-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-1 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | |
| 3026 ts | | 46.1 | 62.4 | 49.3 | 37.6 | 26.4 | 24.8 | 14.2 | 13.3 | 11.6 | 20.2 | 14.7 | 4.1 |
| Mean | | 42.9 | 61.1 | 54.2 | 44.1 | 38.0 | 28.9 | 25.3 | 22.3 | 21.2 | 18.9 | 11.5 | 16.5 |
| SD | | 6.05 | 8.59 | 8.42 | 7.35 | 8.26 | 13.66 | 5.76 | 12.03 | 12.72 | 4.60 | 6.85 | 9.20 |
| N | | 26 | 26 | 26 | 26 | 26 | 26 | 25 | 25 | 25 | 25 | 25 | 25 |

ts = terminal sacrifice

| Males | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal | Phase | PRE-PRC | PRC | | | | | | | | | | PRC-COH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | Week | 2-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-1 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | |
| 4001 ts | | 36.6 | 60.6 | 51.4 | 39.3 | 32.5 | 30.1 | 26.2 | 22.2 | 15.9 | 11.9 | 11.2 | 16.1 |
| 4002 ts | | 38.2 | 56.2 | 55.9 | 38.7 | 48.1 | 27.1 | 36.9 | 26.6 | 19.7 | 28.8 | 6.6 | 21.2 |
| 4003 ts | | 50.7 | 78.6 | 62.7 | 51.0 | 40.9 | 29.6 | 24.0 | 26.9 | 27.3 | 12.8 | -15.4 | 53.3 |
| 4004 ts | | 38.8 | 63.3 | 53.4 | 38.6 | 38.2 | 20.2 | 4.4 | 16.9 | 28.6 | 22.7 | -13.9 | 37.0 |
| 4005 ts | | 38.9 | 57.6 | 48.3 | 40.0 | 35.0 | 27.2 | 28.9 | 27.0 | 7.5 | 15.2 | 13.0 | 14.8 |
| 4006 ts | | 36.5 | 52.8 | 46.7 | 43.2 | 26.4 | 23.1 | 34.8 | 38.6 | 11.7 | 17.6 | 14.3 | 22.6 |
| 4007 ts | | 42.6 | 51.8 | 37.7 | 29.9 | 27.1 | 20.9 | 21.3 | 25.0 | 8.9 | 18.1 | 12.7 | 12.9 |
| 4008 ts | | 47.3 | 60.4 | 52.0 | 39.9 | 41.0 | 27.9 | 25.6 | 25.1 | 15.9 | 13.2 | 12.2 | 10.7 |
| 4009 ts | | 46.9 | 76.6 | 67.8 | 47.1 | 51.9 | 33.7 | 35.1 | 28.9 | 9.8 | 8.4 | 15.9 | 16.5 |
| 4010 ts | | 46.4 | 65.5 | 59.2 | 46.0 | 44.5 | 29.3 | 29.7 | 22.1 | 20.3 | 19.7 | 8.6 | 15.5 |
| 4011 ts | | 58.2 | 75.7 | 72.1 | 58.9 | 52.1 | 26.6 | 44.4 | 29.6 | 41.7 | 14.9 | 19.5 | 24.2 |
| 4012 ts | | 43.1 | 66.2 | 60.5 | 38.5 | 40.0 | 28.2 | 37.0 | 10.8 | 20.8 | 22.1 | 13.6 | 25.8 |
| 4013 ts | | 34.4 | 49.5 | 40.9 | 39.1 | 30.1 | 26.2 | 23.0 | 19.7 | 16.0 | 19.0 | 9.4 | 14.2 |
| 4014 ts | | 43.1 | 58.5 | 56.3 | 37.1 | 39.5 | 27.4 | 23.8 | 29.9 | 22.1 | 12.4 | 3.2 | 13.2 |
| 4015 ts | | 46.4 | 71.9 | 67.3 | 50.2 | 47.2 | 41.3 | 29.2 | 27.4 | 21.9 | 12.4 | 11.9 | 27.9 |
| 4016 ts | | 44.4 | 58.5 | 41.3 | 43.8 | 39.2 | 37.0 | 26.8 | 26.9 | 22.5 | 12.7 | 6.7 | 25.3 |
| 4017 ts | | 50.4 | 73.9 | 63.8 | 47.3 | 39.5 | 34.6 | 25.8 | 30.0 | 26.8 | 14.0 | 12.2 | 24.7 |
| 4018 ts | | 37.8 | 57.8 | 54.9 | 41.3 | 28.9 | 33.2 | 18.6 | 26.2 | 20.8 | 10.0 | 13.0 | 14.8 |
| 4019 ts | | 39.0 | 52.1 | 47.5 | 41.2 | 34.0 | 25.6 | 23.6 | 19.3 | 19.5 | 14.2 | 15.2 | 9.7 |
| 4020 ts | | 39.8 | 65.1 | 47.7 | 35.2 | 35.6 | 28.3 | 28.6 | 29.7 | 18.2 | 16.7 | 12.5 | 19.6 |
| 4021 ts | | 44.4 | 64.9 | 63.5 | 50.7 | 50.2 | 7.0 | 18.9 | 16.6 | 60.1 | 22.0 | 33.8 | 13.2 |
| 4022 ts | | 50.0 | 68.6 | 67.2 | 54.5 | 53.4 | 11.4 | 33.0 | 27.2 | 57.1 | 42.1 | 26.8 | 0.4 |
| 4023 ts | | 35.4 | 51.6 | 46.0 | 37.7 | 37.6 | 38.0 | 27.6 | 16.9 | 10.8 | 17.7 | 11.2 | 21.8 |
| 4024 ts | | 46.8 | 60.2 | 54.9 | 37.9 | 43.9 | 28.7 | 15.5 | 28.3 | 16.1 | 20.0 | 13.1 | 21.5 |
| 4025 ts | | 46.6 | 64.0 | 54.4 | 43.0 | 28.8 | 28.9 | 26.7 | 18.8 | 16.2 | 15.3 | 10.1 | 20.6 |

ts = terminal sacrifice

| Males | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal | Phase | PRE-PRC | PRC | | | | | | | | | | PRC-COH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | Week | 2-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-1 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | |
| 4026 ts | | 46.9 | 65.4 | 52.1 | 45.3 | 46.4 | 34.1 | 31.7 | 27.1 | 16.3 | 5.8 | 20.4 | 11.9 |
| Mean | | 43.4 | 62.6 | 54.8 | 42.9 | 39.7 | 27.9 | 27.0 | 24.8 | 22.0 | 16.9 | 11.5 | 19.6 |
| SD | | 5.72 | 8.17 | 9.03 | 6.46 | 8.02 | 7.41 | 7.92 | 5.83 | 12.92 | 7.13 | 9.86 | 9.98 |
| N | | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |

ts = terminal sacrifice

| Males | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal Number | Phase / Week | COH 1-2 | COH-PMT 2-1 | PMT 1-2 | PMT 2-3 | PMT 3-4 |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | |
| 1001 ts | | 15.4 | 3.4 | 5.7 | 15.1 | |
| 1002 ts | | 19.8 | 12.4 | 3.4 | -0.1 | |
| 1003 ts | | 11.8 | 4.6 | 15.7 | -3.0 | |
| 1004 ts | | 12.5 | 16.4 | -3.7 | 20.0 | |
| 1005 ts | | 16.8 | 0.9 | -4.3 | 7.6 | |
| 1006 ts | | 13.9 | 10.8 | -4.7 | 17.5 | |
| 1007 ts | | 19.3 | 17.4 | 10.0 | 7.9 | |
| 1008 ts | | 17.9 | 8.3 | 22.4 | 12.2 | |
| 1009 ts | | 21.6 | 7.4 | 10.3 | -5.2 | 6.9 |
| 1010 ts | | 15.3 | 10.6 | 17.3 | 5.7 | 18.0 |
| 1011 ts | | 16.6 | -1.9 | 15.5 | 17.2 | 10.7 |
| 1012 ts | | 15.9 | -0.6 | 11.6 | 14.0 | 26.5 |
| 1013 ts | | -0.9 | 1.5 | 11.5 | 13.0 | 14.0 |
| 1014 ts | | 4.6 | 1.9 | 0.7 | 12.7 | 3.4 |
| 1015 ts | | 15.9 | 3.2 | 9.0 | 5.9 | 12.1 |
| 1016 ts | | 0.8 | 6.0 | 3.3 | 14.5 | 8.7 |
| 1017 ts | | 7.6 | 6.5 | 0.6 | 8.1 | 8.8 |
| 1018 ts | | 15.4 | 7.3 | 2.0 | 19.3 | 5.9 |
| 1019 ts | | 13.9 | -2.6 | 10.6 | 4.2 | 5.3 |
| 1020 ts | | 18.8 | 4.2 | 22.0 | 10.4 | 19.0 |
| 1021 ts | | 14.9 | 14.9 | 17.2 | 16.0 | 17.4 |
| 1022 ts | | 12.3 | 7.3 | 7.8 | 15.0 | 11.5 |
| 1023 ts | | 15.6 | 4.9 | -3.7 | 13.7 | 13.4 |
| 1024 ts | | 19.3 | 11.1 | -10.6 | 10.7 | 32.5 |
| 1025 ts | | 9.7 | 7.2 | 7.0 | -0.9 | 9.8 |

ts = terminal sacrifice

| Males | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal Number | Phase Week | COH 1-2 | COH-PMT 2-1 | PMT 1-2 | PMT 2-3 | PMT 3-4 |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | |
| 1026 ts | | 16.5 | 4.7 | 6.1 | 11.8 | 12.5 |
| Mean | | 13.9 | 6.5 | 7.0 | 10.1 | 13.1 |
| SD | | 5.57 | 5.30 | 8.57 | 6.81 | 7.43 |
| N | | 26 | 26 | 26 | 26 | 18 |

ts = terminal sacrifice

| Males | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal Number | Phase / Week | COH 1-2 | COH-PMT 2-1 | PMT 1-2 | PMT 2-3 | PMT 3-4 |
|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | |
| 2001 ts | | 14.9 | 4.0 | 8.0 | 8.4 | |
| 2002 ts | | 23.8 | 1.0 | 15.4 | 13.3 | |
| 2003 ts | | 13.1 | 4.7 | 10.8 | 4.9 | |
| 2004 ts | | 17.1 | 9.3 | 20.4 | 26.8 | |
| 2005 ts | | 2.9 | 3.6 | 4.7 | 15.7 | |
| 2006 ts | | 15.2 | 11.9 | -1.1 | 8.4 | |
| 2007 ts | | 11.9 | 12.5 | -6.1 | 13.1 | |
| 2008 ts | | 16.1 | 2.1 | 15.8 | 1.2 | |
| 2009 ts | | 17.5 | 3.3 | 9.8 | 7.1 | 9.4 |
| 2010 ts | | 15.0 | 15.2 | 6.7 | 3.7 | 11.1 |
| 2011 ts | | 10.9 | 19.3 | 7.4 | -2.9 | 11.9 |
| 2012 ts | | 11.8 | 1.7 | 18.8 | 17.8 | 15.8 |
| 2013 ts | | 3.6 | 11.6 | -138.9 | 148.2 | 15.2 |
| 2014 ts | | 7.0 | 9.3 | 14.3 | 13.7 | 14.0 |
| 2015 ts | | 9.5 | 12.4 | 14.4 | 5.4 | 9.5 |
| 2016 ts | | 12.8 | -1.5 | 9.8 | 5.0 | 15.2 |
| 2017 ts | | 8.7 | 10.2 | 0.3 | 0.7 | 11.6 |
| 2018 ts | | 16.0 | 5.4 | 4.3 | 14.3 | 10.3 |
| 2019 ts | | 35.6 | -2.3 | 23.9 | 18.8 | 15.6 |
| 2020 ts | | 8.9 | -10.2 | 16.2 | 14.4 | -0.2 |
| 2021 ts | | 4.2 | 13.5 | 14.0 | 21.4 | 25.0 |
| 2022 ts | | 16.7 | 11.9 | 10.8 | 5.0 | 18.1 |
| 2023 ts | | 22.8 | 0.9 | 14.0 | 15.2 | 37.2 |
| 2024 ts | | 19.4 | -28.0 | 15.1 | 12.7 | 16.7 |
| 2025 ts | | 5.2 | 13.3 | 3.8 | 5.6 | 6.9 |

ts = terminal sacrifice

| Males | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal Number | Phase Week | COH 1-2 | COH-PMT 2-1 | PMT 1-2 | PMT 2-3 | PMT 3-4 |
|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | |
| 2026 ts | | 9.7 | 13.5 | -1.2 | 7.5 | 12.7 |
| Mean | | 13.5 | 5.7 | 4.3 | 15.6 | 14.2 |
| SD | | 7.13 | 9.58 | 30.08 | 27.92 | 7.74 |
| N | | 26 | 26 | 26 | 26 | 18 |

ts = terminal sacrifice

| Males | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal Number | Phase / Week | COH 1-2 | COH-PMT 2-1 | PMT 1-2 | PMT 2-3 | PMT 3-4 |
|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | |
| 3001 ts | | 13.8 | 6.1 | 7.6 | 4.2 | |
| 3002 u4 | | | | | | |
| 3003 ts | | 13.6 | 11.2 | 0.3 | 25.5 | |
| 3004 ts | | 7.9 | -15.2 | -1.4 | 16.6 | |
| 3005 ts | | 8.6 | 7.1 | 5.1 | 3.6 | |
| 3006 ts | | 28.4 | 12.4 | 2.2 | 8.8 | |
| 3007 ts | | 13.2 | 3.2 | -0.2 | 18.8 | |
| 3008 ts | | 8.4 | 5.5 | -0.8 | 11.2 | |
| 3009 ts | | 9.6 | 8.6 | 2.7 | 20.3 | 12.4 |
| 3010 ts | | 27.4 | 4.1 | -0.6 | 19.2 | 4.8 |
| 3011 ts | | 3.8 | 11.4 | 10.8 | 7.5 | 16.9 |
| 3012 ts | | 20.5 | 5.2 | 3.4 | 10.7 | 20.2 |
| 3013 ts | | 13.5 | 7.2 | -4.2 | 12.2 | 6.9 |
| 3014 ts | | 29.1 | 10.5 | -15.8 | 18.4 | 19.6 |
| 3015 ts | | 7.4 | 19.1 | 136.0 | -137.0 | 8.8 |
| 3016 ts | | 6.7 | 6.3 | 19.3 | 12.3 | 16.5 |
| 3017 ts | | 22.4 | 24.2 | 2.6 | 13.3 | 22.9 |
| 3018 ts | | 20.8 | 20.7 | 13.7 | 20.5 | 9.8 |
| 3019 ts | | 19.4 | 5.5 | 25.9 | 11.3 | 10.9 |
| 3020 ts | | 10.7 | 10.1 | 5.7 | 16.4 | 19.4 |
| 3021 ts | | 5.6 | 6.7 | 0.4 | 18.8 | 14.0 |
| 3022 ts | | 7.2 | 16.5 | 9.0 | 18.3 | -3.1 |
| 3023 ts | | 13.1 | 0.5 | -8.3 | 8.8 | 15.4 |
| 3024 ts | | 11.5 | -2.0 | 14.0 | 17.0 | 11.4 |
| 3025 ts | | 11.5 | 15.3 | -0.5 | 13.4 | 13.2 |

ts = terminal sacrifice, u4 = humane euthanasia

| Males | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal Number | Phase Week | COH 1-2 | COH-PMT 2-1 | PMT 1-2 | PMT 2-3 | PMT 3-4 |
|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | |
| 3026 ts | | 19.0 | -2.5 | 1.7 | 6.7 | 15.3 |
| Mean | | 14.1 | 7.9 | 9.1 | 7.9 | 13.1 |
| SD | | 7.33 | 8.16 | 27.78 | 30.68 | 6.29 |
| N | | 25 | 25 | 25 | 25 | 18 |

ts = terminal sacrifice

| Males | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal Number | Phase Week | COH 1-2 | COH-PMT 2-1 | PMT 1-2 | 2-3 | 3-4 |
|---|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | | |
| 4001 ts | | 24.1 | 5.4 | -3.6 | 11.1 | |
| 4002 ts | | 20.0 | 6.2 | 5.9 | -0.1 | |
| 4003 ts | | 14.5 | 22.9 | -17.3 | 4.8 | |
| 4004 ts | | 11.3 | 15.3 | 10.3 | 16.4 | |
| 4005 ts | | 17.1 | -0.3 | 4.4 | 9.9 | |
| 4006 ts | | 24.1 | -14.1 | 4.3 | 0.5 | |
| 4007 ts | | 15.8 | 5.7 | -5.7 | 12.9 | |
| 4008 ts | | 5.1 | -3.7 | 10.2 | 12.3 | |
| 4009 ts | | 15.2 | 16.9 | 14.8 | 12.8 | 14.1 |
| 4010 ts | | 8.5 | 17.1 | -7.1 | 0.3 | 19.0 |
| 4011 ts | | 14.9 | 12.7 | 16.2 | 11.7 | 23.3 |
| 4012 ts | | 14.7 | 3.6 | 7.0 | 20.5 | 18.4 |
| 4013 ts | | 2.7 | 12.7 | 1.3 | 1.0 | 13.6 |
| 4014 ts | | 4.4 | 6.8 | 1.8 | 6.4 | 5.5 |
| 4015 ts | | 12.2 | 0.7 | -4.4 | 20.2 | 23.0 |
| 4016 ts | | 8.0 | 7.0 | 7.8 | 8.8 | 13.3 |
| 4017 ts | | 3.7 | 9.4 | 6.3 | 22.7 | 28.3 |
| 4018 ts | | 4.8 | -0.6 | 10.5 | 15.9 | 10.9 |
| 4019 ts | | 9.5 | 38.3 | -34.4 | 11.1 | 13.1 |
| 4020 ts | | 17.8 | 3.1 | 11.5 | 16.5 | 13.4 |
| 4021 ts | | 6.2 | 11.1 | 9.1 | 3.7 | 27.8 |
| 4022 ts | | 24.5 | 13.2 | 16.7 | 25.2 | 20.9 |
| 4023 ts | | 4.9 | 4.8 | 5.0 | 19.0 | 10.4 |
| 4024 ts | | 3.1 | 4.0 | 17.9 | 19.5 | 15.6 |
| 4025 ts | | 12.0 | 17.7 | -13.7 | -1.6 | 22.6 |

ts = terminal sacrifice

| Males | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal Number | Phase Week | COH 1-2 | COH-PMT 2-1 | PMT 1-2 | PMT 2-3 | PMT 3-4 |
|---|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | | |
| 4026 ts | | 11.3 | 4.9 | 12.9 | 1.7 | 18.0 |
| Mean | | 11.9 | 8.5 | 3.4 | 10.9 | 17.3 |
| SD | | 6.72 | 9.89 | 11.87 | 7.88 | 6.18 |
| N | | 26 | 26 | 26 | 26 | 18 |

ts = terminal sacrifice

| Females | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal Number | Phase / Week | PRE-PRC 2-1 | PRC 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | PRC-COH 11-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | |
| 1501 | | 17.0 | 22.0 | 18.3 | 12.0 | 12.2 | 12.5 | 3.5 | 3.4 | 3.1 | 9.0 | -0.8 | |
| 1502 | | 15.8 | 20.7 | 17.5 | 15.6 | 17.7 | 8.9 | 4.9 | 11.1 | 13.8 | 1.3 | -2.6 | |
| 1503 | | 18.3 | 18.1 | 19.0 | 17.7 | 19.1 | 7.9 | 7.4 | 5.9 | 14.6 | -0.6 | 1.0 | |
| 1504 | | 20.8 | 31.2 | 20.8 | 23.1 | 11.4 | 14.5 | 5.7 | 13.2 | 7.0 | 1.1 | 2.8 | 17.7 |
| 1505 | | 22.7 | 20.9 | 27.4 | 19.5 | 14.0 | 13.4 | 12.3 | 8.7 | 4.2 | 12.0 | -2.1 | |
| 1506 | | 17.5 | 19.1 | 21.3 | 17.0 | 5.8 | 12.0 | 8.6 | 3.6 | 7.9 | 4.3 | 3.7 | |
| 1507 | | 19.8 | 32.0 | 25.3 | 17.7 | 18.2 | 9.7 | 7.8 | 3.7 | 14.4 | 0.0 | 5.6 | |
| 1508 | | 13.8 | 29.8 | 17.7 | 19.9 | 6.3 | 9.1 | 9.5 | 1.1 | 3.8 | 0.7 | 5.7 | |
| 1509 | | 18.6 | 17.2 | 16.0 | 23.3 | 10.1 | 8.2 | 4.0 | 9.7 | 8.0 | 0.1 | 0.1 | |
| 1510 | | 20.1 | 25.4 | 19.6 | 20.6 | 10.4 | 5.1 | 10.8 | 8.0 | 7.0 | -2.2 | 4.9 | |
| 1511 | | 17.0 | 23.3 | 12.6 | 16.4 | 15.8 | 1.0 | 13.5 | 8.1 | 15.1 | 1.8 | -2.1 | |
| 1512 | | 19.7 | 23.9 | 17.6 | 16.6 | 7.9 | 7.6 | 10.0 | 8.9 | 11.8 | -2.7 | -0.2 | |
| 1513 | | 20.0 | 26.9 | 24.6 | 18.0 | 14.6 | 8.3 | 22.7 | 0.7 | 9.7 | -1.0 | 10.0 | |
| 1514 | | 18.2 | 34.1 | 24.9 | 17.9 | 15.8 | 10.9 | 11.7 | 5.6 | 10.1 | -1.0 | -1.9 | |
| 1515 | | 18.0 | 28.7 | 19.2 | 13.1 | 8.5 | 0.9 | 6.7 | 5.8 | 8.6 | 4.7 | 0.3 | |
| 1516 | | 18.1 | 17.6 | 15.7 | 11.8 | 7.4 | 10.6 | 6.4 | 5.5 | -2.6 | 0.1 | 4.1 | |
| 1517 | | 17.9 | 25.1 | 22.0 | 22.7 | 6.8 | 16.3 | 6.1 | 11.5 | 3.4 | -5.6 | 5.5 | |
| 1518 | | 12.2 | 28.7 | 26.2 | 17.8 | 7.6 | 9.0 | 14.0 | 14.5 | -5.6 | 4.2 | 9.0 | |
| 1519 | | 21.5 | 26.1 | 21.5 | 15.2 | 16.4 | 6.1 | 7.9 | 6.1 | 8.9 | -2.7 | 4.4 | |
| 1520 | | 20.7 | 25.5 | 13.9 | 18.8 | 11.6 | 6.5 | 10.2 | 7.4 | -0.7 | 2.7 | 5.0 | |
| 1521 | | 21.4 | 24.8 | 20.3 | 19.0 | 14.7 | 3.8 | 3.5 | 12.6 | 3.1 | 3.1 | 4.3 | |
| 1522 | | 17.7 | 20.0 | 24.5 | 8.3 | 13.1 | 9.3 | 8.2 | 3.5 | 1.4 | 4.1 | 0.3 | |
| 1523 | | 18.0 | 27.5 | 19.4 | 21.5 | 15.6 | 9.8 | 11.8 | 9.8 | 10.3 | -3.8 | 1.4 | |
| 1524 | | 16.0 | 19.7 | 15.3 | 18.3 | 10.4 | 8.4 | 0.7 | 8.4 | 9.2 | -7.5 | 7.5 | |
| 1525 | | 20.5 | 26.4 | 19.4 | 19.0 | 9.1 | 7.7 | 7.8 | 10.9 | 5.4 | 1.9 | -2.8 | |

| Females | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal | Phase | PRE-PRC | PRC | | | | | | | | | PRC-COH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | Week | 2-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-1 |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | |
| 1526 | | 21.0 | 23.3 | 22.1 | 14.0 | 14.6 | 11.8 | 11.3 | 2.3 | 8.8 | 3.3 | 3.2 | |
| Mean | | 18.6 | 24.5 | 20.1 | 17.5 | 12.1 | 8.8 | 8.7 | 7.3 | 7.0 | 1.1 | 2.6 | 17.7 |
| SD | | 2.42 | 4.61 | 3.85 | 3.61 | 3.97 | 3.64 | 4.37 | 3.76 | 5.28 | 4.16 | 3.63 | |
| N | | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 1 |

| Females | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal | Phase | PRE-PRC | PRC | | | | | | | | | PRC-COH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | Week | 2-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-1 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | |
| 2501 | | 20.9 | 28.1 | 25.9 | 15.7 | 15.0 | 14.8 | 8.5 | 2.2 | 5.1 | 10.2 | -1.0 | |
| 2502 | | 18.6 | 16.7 | 16.6 | 21.5 | 8.7 | 13.4 | -1.5 | 4.6 | 14.2 | 1.5 | -0.4 | |
| 2503 | | 19.8 | 20.5 | 18.6 | 8.4 | 24.0 | 8.2 | -0.7 | 14.6 | -0.5 | 3.1 | 5.6 | |
| 2504 | | 23.7 | 27.4 | 28.5 | 16.5 | 17.9 | 24.6 | 4.8 | 9.5 | 3.2 | 7.8 | -2.8 | |
| 2505 | | 23.3 | 24.9 | 22.2 | 23.4 | 13.1 | 13.7 | 0.4 | 8.8 | 9.1 | -3.3 | 2.7 | |
| 2506 | | 14.1 | 21.0 | 20.4 | 19.9 | 7.9 | 12.8 | 10.3 | 10.1 | -1.6 | 3.5 | 5.3 | |
| 2507 | | 15.1 | 24.0 | 18.4 | 15.7 | 10.7 | 14.8 | -0.8 | 11.8 | 7.3 | 3.1 | 0.7 | |
| 2508 | | 17.2 | 23.5 | 20.2 | 25.5 | 7.7 | 6.2 | 7.5 | 10.4 | 1.5 | 3.0 | 1.7 | |
| 2509 | | 21.9 | 28.5 | 18.6 | 18.9 | 12.9 | 9.8 | 9.3 | -1.1 | 7.1 | 7.6 | -3.8 | |
| 2510 | | 15.8 | 26.0 | 15.6 | 19.0 | 12.3 | 8.4 | 3.0 | 5.7 | 4.3 | 4.1 | -1.9 | |
| 2511 | | 23.3 | 25.6 | 20.0 | 23.7 | 8.9 | 15.3 | 8.0 | 4.5 | 8.9 | 9.3 | 0.3 | |
| 2512 | | 18.8 | 14.7 | 16.2 | 17.1 | 11.8 | 8.4 | 10.1 | 9.4 | 6.5 | 0.9 | 5.1 | |
| 2513 | | 26.4 | 27.8 | 21.8 | 19.1 | 11.8 | 10.0 | 0.3 | 8.7 | 13.5 | -2.4 | -2.2 | |
| 2514 | | 20.2 | 19.1 | 15.3 | 24.7 | 14.2 | 10.2 | 2.3 | 4.2 | 10.8 | 4.5 | -2.1 | |
| 2515 | | 19.5 | 27.4 | 23.6 | 15.4 | 16.4 | 6.3 | 9.1 | 9.6 | -9.1 | 14.2 | 4.1 | |
| 2516 | | 17.3 | 30.3 | 23.9 | 14.1 | 7.1 | 13.7 | 12.8 | 1.2 | 20.9 | 6.5 | -4.3 | |
| 2517 | | 17.8 | 23.0 | 19.2 | 13.1 | 6.8 | 9.1 | 7.6 | 7.4 | 7.1 | 3.4 | 2.7 | |
| 2518 | | 20.0 | 23.4 | 22.3 | 21.0 | 15.1 | 3.6 | 5.4 | 16.7 | 5.1 | -0.1 | 1.7 | |
| 2519 | | 16.7 | 23.1 | 18.2 | 13.6 | 13.0 | 12.7 | 4.2 | 6.9 | 3.5 | 3.5 | 10.4 | |
| 2520 | | 19.9 | 26.4 | 20.5 | 18.7 | 11.1 | 6.3 | 9.5 | 10.2 | 3.1 | 1.6 | 3.9 | |
| 2521 | | 18.4 | 26.4 | 19.5 | 16.9 | 9.8 | 5.8 | 8.5 | 8.7 | -3.5 | 8.6 | 4.7 | |
| 2522 | | 21.7 | 27.0 | 24.7 | 12.6 | 23.1 | 18.1 | 1.7 | 3.7 | 11.8 | 6.1 | -1.1 | |
| 2523 | | 15.4 | 22.6 | 21.6 | 20.5 | 8.8 | 7.4 | 9.3 | 10.0 | 2.2 | 5.0 | 0.0 | |
| 2524 | | 23.9 | 25.5 | 19.7 | 23.5 | 9.0 | 11.2 | 3.5 | 8.6 | 0.4 | 6.0 | 6.5 | 35.2 |
| 2525 | | 24.8 | 29.8 | 19.6 | 29.7 | 17.5 | 5.4 | 0.2 | 8.7 | 10.7 | 1.6 | -4.2 | |

| Females | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal | Phase | PRE-PRC | PRC | | | | | | | | | | PRC-COH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | Week | 2-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-1 |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | |
| 2526 | | 20.1 | 27.0 | 11.4 | 19.4 | 11.2 | 13.7 | -4.6 | 6.3 | 14.8 | 0.1 | -1.7 | |
| Mean | | 19.8 | 24.6 | 20.1 | 18.8 | 12.5 | 10.9 | 5.0 | 7.7 | 6.0 | 4.2 | 1.2 | 35.2 |
| SD | | 3.20 | 3.83 | 3.61 | 4.70 | 4.49 | 4.64 | 4.59 | 3.95 | 6.44 | 3.96 | 3.76 | |
| N | | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 1 |

| Females | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal | Phase | PRE-PRC | PRC | | | | | | | | | | PRC-COH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | Week | 2-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-1 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | |
| 3501 | | 13.1 | 25.3 | 24.4 | 16.5 | 7.7 | 9.8 | 13.4 | 13.5 | -0.5 | 3.2 | 5.1 | |
| 3502 | | 11.3 | 23.7 | 16.6 | 8.1 | 10.0 | 12.2 | 8.6 | 5.6 | 2.8 | 10.0 | 1.6 | |
| 3503 | | 16.1 | 24.2 | 17.5 | 16.1 | 14.4 | 4.7 | -2.1 | 9.6 | 14.2 | 6.2 | -6.0 | |
| 3504 | | 17.3 | 24.7 | 24.4 | 18.0 | 14.5 | 4.3 | 11.0 | 9.8 | 2.4 | 9.0 | -0.6 | |
| 3505 | | 24.0 | 28.1 | -21.0 | 62.3 | 18.7 | 4.6 | 9.7 | 10.1 | 6.6 | 1.4 | 7.3 | |
| 3506 | | 17.6 | 19.2 | 34.7 | -6.8 | 19.4 | 9.7 | 1.5 | 17.4 | 8.4 | 1.1 | -8.2 | |
| 3507 | | 16.6 | 25.5 | 1.2 | 36.8 | 12.0 | 7.6 | 5.8 | 13.5 | -3.2 | 7.1 | 2.6 | |
| 3508 | | 17.5 | 16.7 | 18.0 | 8.2 | 11.8 | 3.2 | 5.2 | 10.4 | -1.1 | 2.9 | -0.6 | |
| 3509 | | 16.5 | 26.2 | 23.5 | 12.2 | 13.2 | 13.5 | 8.7 | 9.0 | 1.3 | 10.5 | -1.1 | |
| 3510 | | 20.3 | 25.2 | 24.6 | 17.4 | 16.5 | 13.2 | 3.4 | 7.5 | 7.5 | 3.8 | -6.1 | |
| 3511 | | 16.3 | 23.4 | 17.2 | 4.7 | 8.4 | 12.2 | 4.6 | 8.8 | 3.4 | 5.9 | 0.3 | |
| 3512 | | 22.7 | 25.3 | 18.7 | 18.6 | 22.2 | 15.5 | 5.3 | 11.1 | 17.0 | 8.3 | -8.6 | |
| 3513 | | 22.4 | 34.7 | 21.3 | 16.3 | 20.0 | 13.7 | 3.9 | 9.5 | 7.4 | 6.9 | 3.4 | |
| 3514 | | 15.6 | 28.0 | 18.0 | 16.9 | 14.0 | 8.9 | 14.2 | 1.6 | 13.5 | -7.2 | 12.8 | |
| 3515 | | 16.2 | 27.6 | 34.4 | -4.0 | 13.3 | 5.9 | 1.5 | 3.1 | 4.5 | 14.7 | -8.1 | 20.8 |
| 3516 | | 26.9 | 28.0 | 16.9 | 17.7 | 15.4 | 7.8 | 2.8 | 10.3 | 8.5 | 3.2 | -0.6 | |
| 3517 ts | | 15.4 | 24.6 | 23.7 | 15.0 | 11.9 | 9.1 | 4.2 | 15.3 | 5.8 | 7.5 | 4.9 | 14.3 |
| 3518 | | 22.0 | 35.2 | 25.4 | 17.3 | 19.5 | 8.5 | -2.7 | 15.9 | 6.9 | 3.5 | 4.1 | |
| 3519 | | 13.9 | 28.4 | 17.7 | 16.7 | 11.0 | 11.3 | 8.4 | 9.9 | 6.7 | -13.0 | 15.0 | |
| 3520 | | 25.2 | 39.1 | 26.6 | 25.8 | 10.2 | 15.6 | 12.0 | 12.4 | 5.7 | 10.1 | 1.7 | |
| 3521 | | 19.5 | 19.1 | 14.6 | 13.9 | 8.0 | 8.3 | 0.8 | 15.7 | 15.9 | 0.3 | -6.6 | |
| 3522 | | 17.2 | 23.7 | 22.9 | 19.7 | 6.6 | 16.4 | 3.2 | 6.3 | 3.4 | 3.7 | -3.1 | |
| 3523 | | 19.6 | 30.2 | 12.8 | 18.4 | 14.3 | 9.6 | 5.1 | 14.4 | 7.8 | -3.7 | 2.4 | |
| 3524 | | 17.6 | 25.2 | 17.2 | 14.6 | 14.2 | 16.8 | 1.7 | 9.2 | 9.7 | -1.2 | 0.8 | |
| 3525 | | 21.5 | 27.3 | 17.9 | 16.1 | 12.7 | 4.8 | 0.8 | 10.3 | 4.6 | 6.0 | -3.5 | |

ts = terminal sacrifice

| Females | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal | Phase | PRE-PRC | PRC | | | | | | | | | | PRC-COH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | Week | 2-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-1 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | |
| 3526 | | 20.4 | 32.2 | 23.4 | 16.9 | 10.8 | 9.5 | 4.9 | 13.3 | 8.4 | 5.1 | -0.6 | |
| Mean | | 18.6 | 26.6 | 18.9 | 16.7 | 13.5 | 9.9 | 5.2 | 10.5 | 6.4 | 4.0 | 0.3 | 17.6 |
| SD | | 3.79 | 4.94 | 10.49 | 12.48 | 4.07 | 3.97 | 4.44 | 3.83 | 4.97 | 5.83 | 5.95 | 4.60 |
| N | | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 2 |

| Females | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal | Phase | PRE-PRC | PRC | | | | | | | | | PRC-COH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | Week | 2-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-1 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | |
| 4501 | | 19.3 | 29.7 | 17.8 | 10.4 | 16.1 | 17.1 | -1.1 | 14.0 | 1.2 | 6.7 | 3.8 | |
| 4502 | | 21.3 | 28.8 | 15.9 | 19.9 | 18.6 | 12.7 | 0.6 | 7.4 | 5.5 | 4.3 | -5.6 | |
| 4503 | | 21.5 | 23.3 | 17.5 | 15.3 | 20.0 | 9.3 | 8.1 | 4.1 | 8.6 | 8.4 | -1.8 | |
| 4504 | | 4.0 | 39.7 | 21.2 | 16.5 | 10.5 | 0.1 | 11.4 | 7.9 | -1.5 | -2.6 | 4.6 | |
| 4505 | | 20.9 | 37.0 | 22.0 | 17.0 | 18.7 | 5.8 | 7.0 | 13.7 | 11.5 | -1.2 | 1.4 | |
| 4506 | | 17.9 | 18.6 | 16.1 | 14.6 | 2.3 | 10.4 | 11.5 | 4.8 | 7.8 | 1.9 | 6.0 | |
| 4507 | | 16.1 | 15.2 | 23.1 | 10.5 | 16.5 | 1.4 | 5.3 | 9.2 | 9.6 | 5.6 | -3.7 | |
| 4508 | | 16.1 | 25.8 | 19.0 | 15.9 | 22.5 | 6.4 | 4.8 | 13.9 | 4.7 | 7.6 | 8.1 | |
| 4509 | | 25.5 | 31.0 | 15.4 | 13.9 | 4.9 | 9.1 | 11.6 | 2.6 | 5.2 | 5.8 | -3.3 | |
| 4510 | | 21.2 | 22.7 | 24.5 | 17.4 | 12.1 | 15.5 | 9.9 | 6.1 | 4.4 | 11.3 | -1.7 | |
| 4511 | | 17.9 | 25.0 | 15.0 | 9.0 | 18.8 | 12.8 | 10.9 | 1.9 | 5.6 | 10.1 | 1.6 | |
| 4512 | | 16.8 | 24.9 | 11.1 | 21.7 | 15.7 | 10.3 | 5.2 | 9.0 | 11.9 | 4.8 | -7.2 | |
| 4513 | | 19.3 | 21.5 | 16.0 | 13.6 | 10.6 | 9.3 | 9.4 | 5.1 | 3.6 | 7.9 | 0.1 | |
| 4514 | | 19.7 | 29.6 | 13.6 | 19.0 | 16.9 | 6.5 | 3.5 | 6.1 | 10.3 | 14.1 | 4.0 | |
| 4515 | | 23.1 | 13.6 | 27.0 | 22.7 | 15.6 | 5.0 | 22.6 | 6.7 | -0.3 | 16.7 | -7.7 | |
| 4516 | | 19.4 | 24.3 | 20.9 | 19.3 | 14.7 | 4.2 | 13.2 | 11.6 | 0.9 | 0.6 | 2.3 | |
| 4517 | | 17.3 | 29.1 | 16.6 | 12.9 | 14.5 | 6.1 | 12.3 | 4.7 | 3.5 | 6.1 | 3.4 | |
| 4518 | | 20.2 | 23.9 | 18.4 | 17.6 | 17.7 | 4.4 | 12.3 | 9.9 | 4.8 | 2.5 | 6.3 | |
| 4519 | | 18.6 | 34.5 | 21.9 | 17.3 | 8.3 | 15.5 | 3.3 | -2.7 | 11.2 | 9.1 | 2.7 | |
| 4520 | | 22.8 | 27.9 | 16.3 | 23.0 | 13.4 | 11.3 | 2.8 | 5.4 | 11.0 | -1.6 | -1.2 | |
| 4521 | | 18.6 | 23.3 | 18.9 | 14.3 | 11.2 | 6.3 | 13.6 | 6.1 | 3.4 | 4.2 | 5.3 | |
| 4522 | | 23.4 | 24.8 | 17.0 | 19.1 | 15.8 | 3.1 | 5.6 | 6.9 | 12.2 | 7.7 | -4.5 | |
| 4523 | | 17.0 | 24.7 | 12.9 | 11.4 | 15.7 | 9.3 | 2.4 | 6.8 | 8.6 | 1.3 | 0.4 | |
| 4524 | | 16.3 | 27.7 | 15.9 | 13.7 | 10.6 | 12.7 | 6.8 | 9.0 | 0.0 | 4.0 | 3.8 | |
| 4525 | | 23.8 | 34.4 | 22.7 | 19.0 | 11.8 | 12.3 | 13.2 | 3.9 | 5.2 | 12.0 | 0.3 | |

| Females | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal | Phase | PRE-PRC | PRC | | | | | | | | | PRC-COH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | Week | 2-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-1 |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | |
| 4526 | | 22.0 | 24.9 | 15.4 | 22.2 | 8.6 | 3.1 | 5.3 | 8.9 | 7.5 | 1.8 | -2.8 | |
| Mean | | 19.2 | 26.4 | 18.2 | 16.4 | 13.9 | 8.5 | 8.1 | 7.0 | 6.0 | 5.7 | 0.6 | |
| SD | | 4.05 | 6.03 | 3.80 | 3.92 | 4.70 | 4.52 | 5.16 | 3.82 | 4.07 | 4.81 | 4.28 | |
| N | | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | |

| Females | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal Number | Phase / Week | COH 1-2 | COH-PMT 2-1 | PMT 1-2 | PMT 2-3 | PMT 3-4 |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | |
| 1501 | | | | | | |
| 1502 | | | | | | |
| 1503 | | | | | | |
| 1504 | | 14.0 | | | | |
| 1505 | | | | | | |
| 1506 | | | | | | |
| 1507 | | | | | | |
| 1508 | | | | | | |
| 1509 | | | | | | |
| 1510 | | | | | | |
| 1511 | | | | | | |
| 1512 | | | | | | |
| 1513 | | | | | | |
| 1514 | | | | | | |
| 1515 | | | | | | |
| 1516 | | | | | | |
| 1517 | | | | | | |
| 1518 | | | | | | |
| 1519 | | | | | | |
| 1520 | | | | | | |
| 1521 | | | | | | |
| 1522 | | | | | | |
| 1523 | | | | | | |
| 1524 | | | | | | |
| 1525 | | | | | | |

| Females | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal | Phase | COH | COH-PMT | PMT | | |
|---|---|---|---|---|---|---|
| Number | Week | 1-2 | 2-1 | 1-2 | 2-3 | 3-4 |
| Group 1 - 0 mg/m$^3$ | | | | | | |
| 1526 | | | | | | |
| Mean | | 14.0 | | | | |
| SD | | | | | | |
| N | | 1 | | | | |

| Females | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal Number | Phase Week | COH 1-2 | COH-PMT 2-1 | PMT 1-2 | PMT 2-3 | PMT 3-4 |
|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | |
| 2501 | | | | | | |
| 2502 | | | | | | |
| 2503 | | | | | | |
| 2504 | | | | | | |
| 2505 | | | | | | |
| 2506 | | | | | | |
| 2507 | | | | | | |
| 2508 | | | | | | |
| 2509 | | | | | | |
| 2510 | | | | | | |
| 2511 | | | | | | |
| 2512 | | | | | | |
| 2513 | | | | | | |
| 2514 | | | | | | |
| 2515 | | | | | | |
| 2516 | | | | | | |
| 2517 | | | | | | |
| 2518 | | | | | | |
| 2519 | | | | | | |
| 2520 | | | | | | |
| 2521 | | | | | | |
| 2522 | | | | | | |
| 2523 | | | | | | |
| 2524 | | 19.6 | | | | |
| 2525 | | | | | | |

| Females | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal | Phase | COH | COH-PMT | PMT | | |
|---|---|---|---|---|---|---|
| Number | Week | 1-2 | 2-1 | 1-2 | 2-3 | 3-4 |

Group 2 - 2,000 mg/m$^3$

2526

| | |
|---|---|
| Mean | 19.6 |
| SD | |
| N | 1 |

| Females | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal | Phase | COH | COH-PMT | PMT | | |
|---|---|---|---|---|---|---|
| Number | Week | 1-2 | 2-1 | 1-2 | 2-3 | 3-4 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | |
| 3501 | | | | | | |
| 3502 | | | | | | |
| 3503 | | | | | | |
| 3504 | | | | | | |
| 3505 | | | | | | |
| 3506 | | | | | | |
| 3507 | | | | | | |
| 3508 | | | | | | |
| 3509 | | | | | | |
| 3510 | | | | | | |
| 3511 | | | | | | |
| 3512 | | | | | | |
| 3513 | | | | | | |
| 3514 | | | | | | |
| 3515 | | 12.0 | | | | |
| 3516 | | | | | | |
| 3517 ts | | 5.2 | 0.2 | -1.8 | 3.5 | 3.8 |
| 3518 | | | | | | |
| 3519 | | | | | | |
| 3520 | | | | | | |
| 3521 | | | | | | |
| 3522 | | | | | | |
| 3523 | | | | | | |
| 3524 | | | | | | |
| 3525 | | | | | | |

ts = terminal sacrifice

| Females | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal | Phase | COH | COH-PMT | PMT | | |
|---|---|---|---|---|---|---|
| Number | Week | 1-2 | 2-1 | 1-2 | 2-3 | 3-4 |
| Group 3 - 10,000 mg/m$^3$ | | | | | | |
| 3526 | | | | | | |
| Mean | | 8.6 | 0.2 | -1.8 | 3.5 | 3.8 |
| SD | | 4.81 | | | | |
| N | | 2 | 1 | 1 | 1 | 1 |

| Females | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal | Phase | COH | COH-PMT | PMT | | |
|---|---|---|---|---|---|---|
| Number | Week | 1-2 | 2-1 | 1-2 | 2-3 | 3-4 |

Group 4 - 20,000 mg/$m^3$

4501
4502
4503
4504
4505
4506
4507
4508
4509
4510
4511
4512
4513
4514
4515
4516
4517
4518
4519
4520
4521
4522
4523
4524
4525

| Females | Body weight change during premating, mating and postmating periods - individual values (grams) | Appendix 6 |
|---|---|---|

| Animal | Phase | COH | COH-PMT | PMT | | |
|---|---|---|---|---|---|---|
| Number | Week | 1-2 | 2-1 | 1-2 | 2-3 | 3-4 |

Group 4 - 20,000 mg/$m^3$

4526

Mean
SD
N

| Females | Body weight during gestation - individual values (grams) | Appendix 7 |
|---|---|---|

| Animal Number | Phase Day | GES 0 | 4 | 7 | 14 | 21 |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | |
| 1501 | | 263.9 | 277.8 | 285.7 | 318.1 | 362.9 |
| 1502 | | 284.0 | 298.3 | 311.1 | 343.7 | 425.7 |
| 1503 | | 282.7 | 293.4 | 302.7 | 339.9 | 406.7 |
| 1504 ts,np | | | | | 349.2x | 359.9x |
| 1505 | | 329.4 | 338.6 | 346.2 | 372.6 | 440.5 |
| 1506 | | 263.2 | 271.2 | 284.8 | 311.0 | 384.3 |
| 1507 | | 311.0 | 331.9 | 341.3 | 371.2 | 439.3 |
| 1508 | | 278.5 | 293.6 | 302.7 | 328.7 | 413.5 |
| 1509 tll | | 272.5 | 287.2 | 295.4 | 328.7 | 373.1 |
| 1510 | | 284.8 | 310.0 | 321.5 | 354.2 | 417.6 |
| 1511 | | 289.2 | 305.5 | 307.8 | 351.3 | 427.3 |
| 1512 ts,np | | 273.8x | 275.8x | 280.4x | 287.1x | 295.9x |
| 1513 tll | | 310.2 | 327.2 | 333.4 | 362.3 | 413.8 |
| 1514 | | 313.8 | 328.9 | 334.7 | 367.1 | 423.7 |
| 1515 | | 262.5 | 276.2 | 282.8 | 304.7 | 370.9 |
| 1516 | | 258.5 | 273.6 | 283.3 | 312.9 | 376.9 |
| 1517 | | 284.2 | 303.0 | 312.6 | 340.9 | 390.5 |
| 1518 | | 301.8 | 328.9 | 343.4 | 373.5 | 445.1 |
| 1519 | | 286.4 | 299.8 | 306.3 | 333.5 | 387.1 |
| 1520 | | 280.6 | 295.6 | 302.9 | 340.1 | 391.4 |
| 1521 ts,np | | 282.9x | 299.2x | 303.0x | 306.6x | 308.0x |
| 1522 tll | | 272.8 | 291.3 | 298.7 | 331.8 | 392.8 |
| 1523 | | 292.8 | 303.5 | 312.7 | 341.7 | 415.8 |
| 1524 ts,np | | 255.7x | 268.2x | 268.9x | 290.7x | 286.1x |
| 1525 | | 279.7 | 294.4 | 308.4 | 348.9 | 416.6 |

ts = terminal sacrifice, tll = total litter loss, np = not pregnant, x = excluded from calculation

| Females | Body weight during gestation - individual values (grams) | Appendix 7 |
|---|---|---|

| Animal Number | Phase Day | GES 0 | 4 | 7 | 14 | 21 |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | |
| 1526 | | 295.1 | 300.0 | 320.7 | 356.1 | 386.5 |
| Mean | | 286.3 | 301.4 | 310.9 | 342.4 | 404.6 |
| SD | | 18.35 | 19.51 | 19.53 | 20.25 | 24.16 |
| N | | 22 | 22 | 22 | 22 | 22 |

| Females | Body weight during gestation - individual values (grams) | Appendix 7 |
|---|---|---|

| Animal Number | Phase Day | GES 0 | 4 | 7 | 14 | 21 |
|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | |
| 2501 | | 295.9 | 314.4 | 326.2 | 359.4 | 431.4 |
| 2502 | | 272.7 | 286.0 | 292.6 | 321.6 | 384.4 |
| 2503 | | 279.6 | 284.9 | 291.1 | 314.5 | 372.9 |
| 2504 | | 329.4 | 363.0 | 377.0 | 420.3 | 477.1 |
| 2505 ts,np | | 295.2x | 313.5x | 317.3x | 323.1x | 328.3x |
| 2506 tll | | 275.7 | 290.2 | 301.2 | 329.9 | 382.1 |
| 2507 | | 284.9 | 289.0 | 300.5 | 326.8 | 395.3 |
| 2508 ts,np | | 266.5x | 271.2x | 274.1x | 282.5x | 297.0x |
| 2509 | | 294.2 | 312.5 | 322.4 | 353.5 | 420.7 |
| 2510 | | 270.5 | 286.3 | 290.7 | 317.4 | 385.3 |
| 2511 ts,np | | 294.4x | 315.5x | 322.3x | 343.9x | 344.9x |
| 2512 | | 268.2 | 289.7 | 294.5 | 331.2 | 416.6 |
| 2513 | | 306.9 | 315.3 | 310.2 | 344.8 | 390.6 |
| 2514 | | 292.0 | 302.2 | 301.1 | 333.4 | 403.7 |
| 2515 | | 306.1 | 316.4 | 320.2 | 351.0 | 419.4 |
| 2516 tll | | 302.8 | 316.8 | 315.8 | 346.5 | 401.3 |
| 2517 | | 260.7 | 275.1 | 279.1 | 308.3 | 375.5 |
| 2518 | | 290.5 | 299.9 | 309.1 | 325.9 | 388.6 |
| 2519 | | 268.5 | 281.3 | 286.3 | 306.6 | 361.3 |
| 2520 | | 284.7 | 303.7 | 307.9 | 341.2 | 396.2 |
| 2521 | | 268.7 | 285.8 | 297.9 | 324.6 | 401.1 |
| 2522 | | 313.1 | 330.2 | 330.4 | 364.5 | 429.5 |
| 2523 | | 256.0 | 264.1 | 269.9 | 296.8 | 329.7 |
| 2524 | | | | | 353.6 | 392.5 |
| 2525 ts,np | | 307.5x | 307.9x | 303.8x | 310.8x | 315.8x |

ts = terminal sacrifice, tll = total litter loss, np = not pregnant, x = excluded from calculation

| Females | Body weight during gestation - individual values (grams) | Appendix 7 |
|---|---|---|

| Animal Number | Phase Day | GES 0 | 4 | 7 | 14 | 21 |
|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | |
| 2526 tll | | 287.4 | 299.3 | 300.7 | 325.9 | 384.6 |
| Mean | | 286.1 | 300.3 | 305.9 | 336.3 | 397.3 |
| SD | | 18.70 | 21.73 | 22.36 | 25.99 | 29.14 |
| N | | 21 | 21 | 21 | 22 | 22 |

tll = total litter loss,

| Females | Body weight during gestation - individual values (grams) | Appendix 7 |
|---|---|---|

| Animal Number | Phase Day | GES 0 | 4 | 7 | 14 | 21 |
|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | |
| 3501 | | 300.7 | 318.2 | 334.3 | 371.4 | 435.6 |
| 3502 ts,np | | 254.0x | 270.1x | 275.9x | 278.9x | 280.5x |
| 3503 | | 268.8 | 287.8 | 288.6 | 319.0 | 375.5 |
| 3504 tll | | 278.6 | 300.4 | 303.2 | 328.6 | 381.2 |
| 3505 | | 327.3 | 347.7 | 360.9 | 388.3 | 451.9 |
| 3506 | | 277.1 | 294.4 | 301.2 | 328.6 | 398.4 |
| 3507 | | 282.5 | 300.9 | 308.5 | 335.0 | 387.3 |
| 3508 | | 238.7 | 247.8 | 258.0 | 283.5 | 343.4 |
| 3509 | | 302.1 | 325.2 | 333.9 | 367.1 | 439.4 |
| 3510 | | 288.2 | 311.1 | 317.6 | 349.4 | 428.6 |
| 3511 | | 251.5 | 270.4 | 280.1 | 312.9 | 384.2 |
| 3512 | | 328.9 | 358.8 | 383.3 | 431.5 | 514.0 |
| 3513 | | 321.9 | 344.5 | 347.4 | 380.8 | 448.5 |
| 3514 | | 275.6 | 298.1 | 309.3 | 334.8 | 400.2 |
| 3515 | | | | | 314.2 | |
| 3516 | | 294.3 | 316.3 | 315.8 | 353.2 | 421.1 |
| 3518 | | 326.0 | 338.2 | 342.8 | 372.3 | 436.2 |
| 3519 ts,np | | 284.7x | 282.0x | 286.4x | 288.2x | 306.2x |
| 3520 | | 351.2 | 372.2 | 387.8 | 409.4 | 473.7 |
| 3521 tll | | 251.6 | 271.3 | 281.1 | 300.4 | 343.1 |
| 3522 | | 286.3 | 299.3 | 306.4 | 340.5 | 402.0 |
| 3523 | | 277.6 | 294.9 | 303.3 | 330.5 | 396.9 |
| 3524 ts,np | | | 270.4x | 269.3x | 279.2x | 297.2x |
| 3525 | | 283.9 | 295.2 | 296.3 | 319.9 | 387.4 |
| 3526 | | 309.9 | 330.4 | 337.7 | 368.4 | 448.0 |

ts = terminal sacrifice, tll = total litter loss, np = not pregnant, x = excluded from calculation

| Females | Body weight during gestation - individual values (grams) | Appendix 7 |
|---|---|---|

| Animal Number | Phase Day | GES 0 | 4 | 7 | 14 | 21 |
|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | |
| Mean | | 291.6 | 310.6 | 318.9 | 347.3 | 414.1 |
| SD | | 28.63 | 30.78 | 33.24 | 36.03 | 41.81 |
| N | | 21 | 21 | 21 | 22 | 21 |

| Females | Body weight during gestation - individual values (grams) | Appendix 7 |
|---|---|---|

| Animal Number | Phase Day | GES 0 | 4 | 7 | 14 | 21 |
|---|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | | |
| 4501 | | 290.1 | 308.4 | 317.7 | 345.4 | 407.4 |
| 4502 | | 292.3 | 307.3 | 309.8 | 331.9 | 402.6 |
| 4503 | | 297.4 | 309.0 | 312.2 | 338.0 | 311.9 |
| 4504 | | 271.3 | 282.4 | 292.0 | 317.4 | 371.0 |
| 4505 | | 305.7 | 319.2 | 330.7 | 356.3 | 411.1 |
| 4506 ts,np | | 242.4x | 270.5x | 264.2x | 270.5x | 280.2x |
| 4507 u1 | | 259.9 | 278.3 | 286.3 | 322.4 | 365.0 |
| 4508 ts,np | | 291.0x | 314.0x | 312.6x | 325.4x | 343.8x |
| 4509 | | 288.8 | 309.2 | 320.8 | 352.9 | 424.5 |
| 4510 | | 307.0 | 331.0 | 345.4 | 366.9 | 448.2 |
| 4511 ts,np | | 293.3x | 297.1x | 306.9x | 309.7x | 325.4x |
| 4512 | | 284.3 | 299.2 | 297.2 | 327.3 | 397.7 |
| 4513 | | 258.7 | 280.7 | 295.1 | 321.1 | 381.2 |
| 4514 ts,np | | 305.0x | 318.2x | 311.2x | 316.5x | 333.4x |
| 4515 | | 311.4 | 333.6 | 342.6 | 371.1 | 447.4 |
| 4516 | | 275.7 | 289.4 | 298.0 | 325.8 | 392.6 |
| 4517 | | 270.5 | 291.0 | 299.4 | 323.4 | 396.0 |
| 4518 | | 305.4 | 320.1 | 326.8 | 363.5 | 428.3 |
| 4519 ts,np | | 295.0x | 312.0x | 324.3x | 324.5x | 325.9x |
| 4520 ts,np | | 298.4x | 301.7x | 306.1x | 311.5x | 319.9x |
| 4521 | | 267.0 | 276.0 | 285.6 | 315.3 | 371.2 |
| 4522 | | 286.2 | 305.4 | 309.4 | 324.3 | 425.0 |
| 4523 | | 261.0 | 273.3 | 282.1 | 308.8 | 375.1 |
| 4524 | | 279.2 | 290.6 | 294.1 | 325.5 | 396.1 |
| 4525 | | 309.6 | 333.8 | 343.5 | 376.6 | 431.3 |

ts = terminal sacrifice, u1 = found dead, np = not pregnant, x = excluded from calculation

| Females | Body weight during gestation - individual values (grams) | Appendix 7 |
|---|---|---|

| Animal Number | Phase Day | GES 0 | 4 | 7 | 14 | 21 |
|---|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | | |
| 4526 | | 259.9 | 282.8 | 293.9 | 325.4 | 406.5 |
| Mean | | 284.1 | 301.0 | 309.1 | 337.0 | 399.5 |
| SD | | 18.11 | 19.63 | 20.17 | 20.52 | 32.05 |
| N | | 20 | 20 | 20 | 20 | 20 |

| Females | Body weight change during gestation - individual values (grams) | Appendix 8 |
|---|---|---|

| Animal Number | Phase Day | GES 0-4 | 4-7 | 7-14 | 14-21 |
|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | |
| 1501 | | 13.9 | 7.9 | 32.4 | 44.8 |
| 1502 | | 14.3 | 12.8 | 32.6 | 82.0 |
| 1503 | | 10.7 | 9.3 | 37.2 | 66.8 |
| 1504 ts,np | | | | | 10.7x |
| 1505 | | 9.2 | 7.6 | 26.4 | 67.9 |
| 1506 | | 8.0 | 13.6 | 26.2 | 73.3 |
| 1507 | | 20.9 | 9.4 | 29.9 | 68.1 |
| 1508 | | 15.1 | 9.1 | 26.0 | 84.8 |
| 1509 tll | | 14.7 | 8.2 | 33.3 | 44.4 |
| 1510 | | 25.2 | 11.5 | 32.7 | 63.4 |
| 1511 | | 16.3 | 2.3 | 43.5 | 76.0 |
| 1512 ts,np | | 2.0x | 4.6x | 6.7x | 8.8x |
| 1513 tll | | 17.0 | 6.2 | 28.9 | 51.5 |
| 1514 | | 15.1 | 5.8 | 32.4 | 56.6 |
| 1515 | | 13.7 | 6.6 | 21.9 | 66.2 |
| 1516 | | 15.1 | 9.7 | 29.6 | 64.0 |
| 1517 | | 18.8 | 9.6 | 28.3 | 49.6 |
| 1518 | | 27.1 | 14.5 | 30.1 | 71.6 |
| 1519 | | 13.4 | 6.5 | 27.2 | 53.6 |
| 1520 | | 15.0 | 7.3 | 37.2 | 51.3 |
| 1521 ts,np | | 16.3x | 3.8x | 3.6x | 1.4x |
| 1522 tll | | 18.5 | 7.4 | 33.1 | 61.0 |
| 1523 | | 10.7 | 9.2 | 29.0 | 74.1 |
| 1524 ts,np | | 12.5x | 0.7x | 21.8x | -4.6x |
| 1525 | | 14.7 | 14.0 | 40.5 | 67.7 |

ts = terminal sacrifice, tll = total litter loss, np = not pregnant, x = excluded from calculation

| Females | Body weight change during gestation - individual values (grams) | Appendix 8 |
|---|---|---|

| Animal Number | Phase Day | GES 0-4 | 4-7 | 7-14 | 14-21 |
|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | |
| 1526 | | 4.9 | 20.7 | 35.4 | 30.4 |
| Mean | | 15.1 | 9.5 | 31.5 | 62.2 |
| SD | | 5.10 | 3.86 | 5.08 | 13.30 |
| N | | 22 | 22 | 22 | 22 |

| Females | Body weight change during gestation - individual values (grams) | Appendix 8 |
|---|---|---|

| Animal Number | Phase Day | GES 0-4 | 4-7 | 7-14 | 14-21 |
|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | |
| 2501 | | 18.5 | 11.8 | 33.2 | 72.0 |
| 2502 | | 13.3 | 6.6 | 29.0 | 62.8 |
| 2503 | | 5.3 | 6.2 | 23.4 | 58.4 |
| 2504 | | 33.6 | 14.0 | 43.3 | 56.8 |
| 2505 ts,np | | 18.3x | 3.8x | 5.8x | 5.2x |
| 2506 tll | | 14.5 | 11.0 | 28.7 | 52.2 |
| 2507 | | 4.1 | 11.5 | 26.3 | 68.5 |
| 2508 ts,np | | 4.7x | 2.9x | 8.4x | 14.5x |
| 2509 | | 18.3 | 9.9 | 31.1 | 67.2 |
| 2510 | | 15.8 | 4.4 | 26.7 | 67.9 |
| 2511 ts,np | | 21.1x | 6.8x | 21.6x | 1.0x |
| 2512 | | 21.5 | 4.8 | 36.7 | 85.4 |
| 2513 | | 8.4 | -5.1 | 34.6 | 45.8 |
| 2514 | | 10.2 | -1.1 | 32.3 | 70.3 |
| 2515 | | 10.3 | 3.8 | 30.8 | 68.4 |
| 2516 tll | | 14.0 | -1.0 | 30.7 | 54.8 |
| 2517 | | 14.4 | 4.0 | 29.2 | 67.2 |
| 2518 | | 9.4 | 9.2 | 16.8 | 62.7 |
| 2519 | | 12.8 | 5.0 | 20.3 | 54.7 |
| 2520 | | 19.0 | 4.2 | 33.3 | 55.0 |
| 2521 | | 17.1 | 12.1 | 26.7 | 76.5 |
| 2522 | | 17.1 | 0.2 | 34.1 | 65.0 |
| 2523 | | 8.1 | 5.8 | 26.9 | 32.9 |
| 2524 | | | | | 38.9 |
| 2525 ts,np | | 0.4x | -4.1x | 7.0x | 5.0x |

ts = terminal sacrifice, tll = total litter loss, np = not pregnant, x = excluded from calculation

| Females | Body weight change during gestation - individual values (grams) | Appendix 8 |
|---|---|---|

| Animal Number | Phase Day | GES 0-4 | 4-7 | 7-14 | 14-21 |
|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | |
| 2526 tll | | 11.9 | 1.4 | 25.2 | 58.7 |
| Mean | | 14.2 | 5.7 | 29.5 | 61.0 |
| SD | | 6.41 | 5.04 | 5.77 | 12.01 |
| N | | 21 | 21 | 21 | 22 |

tll = total litter loss,

| Females | Body weight change during gestation - individual values (grams) | Appendix 8 |
|---|---|---|

| Animal Number | Phase Day | GES 0-4 | 4-7 | 7-14 | 14-21 |
|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | |
| 3501 | | 17.5 | 16.1 | 37.1 | 64.2 |
| 3502 ts,np | | 16.1x | 5.8x | 3.0x | 1.6x |
| 3503 | | 19.0 | 0.8 | 30.4 | 56.5 |
| 3504 tll | | 21.8 | 2.8 | 25.4 | 52.6 |
| 3505 | | 20.4 | 13.2 | 27.4 | 63.6 |
| 3506 | | 17.3 | 6.8 | 27.4 | 69.8 |
| 3507 | | 18.4 | 7.6 | 26.5 | 52.3 |
| 3508 | | 9.1 | 10.2 | 25.5 | 59.9 |
| 3509 | | 23.1 | 8.7 | 33.2 | 72.3 |
| 3510 | | 22.9 | 6.5 | 31.8 | 79.2 |
| 3511 | | 18.9 | 9.7 | 32.8 | 71.3 |
| 3512 | | 29.9 | 24.5 | 48.2 | 82.5 |
| 3513 | | 22.6 | 2.9 | 33.4 | 67.7 |
| 3514 | | 22.5 | 11.2 | 25.5 | 65.4 |
| 3516 | | 22.0 | -0.5 | 37.4 | 67.9 |
| 3518 | | 12.2 | 4.6 | 29.5 | 63.9 |
| 3519 ts,np | | -2.7x | 4.4x | 1.8x | 18.0x |
| 3520 | | 21.0 | 15.6 | 21.6 | 64.3 |
| 3521 tll | | 19.7 | 9.8 | 19.3 | 42.7 |
| 3522 | | 13.0 | 7.1 | 34.1 | 61.5 |
| 3523 | | 17.3 | 8.4 | 27.2 | 66.4 |
| 3524 ts,np | | | -1.1x | 9.9x | 18.0x |
| 3525 | | 11.3 | 1.1 | 23.6 | 67.5 |
| 3526 | | 20.5 | 7.3 | 30.7 | 79.6 |

ts = terminal sacrifice, tll = total litter loss, np = not pregnant, x = excluded from calculation

| Females | Body weight change during gestation - individual values (grams) | Appendix 8 |
|---|---|---|

| Animal Number | Phase Day | GES 0-4 | 4-7 | 7-14 | 14-21 |
|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | |
| Mean | | 19.1 | 8.3 | 29.9 | 65.3 |
| SD | | 4.74 | 5.85 | 6.36 | 9.45 |
| N | | 21 | 21 | 21 | 21 |

| Females | Body weight change during gestation - individual values (grams) | Appendix 8 |
|---|---|---|

| Animal Number | Phase Day | GES 0-4 | 4-7 | 7-14 | 14-21 |
|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | |
| 4501 | | 18.3 | 9.3 | 27.7 | 62.0 |
| 4502 | | 15.0 | 2.5 | 22.1 | 70.7 |
| 4503 | | 11.6 | 3.2 | 25.8 | -26.1 |
| 4504 | | 11.1 | 9.6 | 25.4 | 53.6 |
| 4505 | | 13.5 | 11.5 | 25.6 | 54.8 |
| 4506 ts,np | | 28.1x | -6.3x | 6.3x | 9.7x |
| 4507 u1 | | 18.4 | 8.0 | 36.1 | 42.6 |
| 4508 ts,np | | 23.0x | -1.4x | 12.8x | 18.4x |
| 4509 | | 20.4 | 11.6 | 32.1 | 71.6 |
| 4510 | | 24.0 | 14.4 | 21.5 | 81.3 |
| 4511 ts,np | | 3.8x | 9.8x | 2.8x | 15.7x |
| 4512 | | 14.9 | -2.0 | 30.1 | 70.4 |
| 4513 | | 22.0 | 14.4 | 26.0 | 60.1 |
| 4514 ts,np | | 13.2x | -7.0x | 5.3x | 16.9x |
| 4515 | | 22.2 | 9.0 | 28.5 | 76.3 |
| 4516 | | 13.7 | 8.6 | 27.8 | 66.8 |
| 4517 | | 20.5 | 8.4 | 24.0 | 72.6 |
| 4518 | | 14.7 | 6.7 | 36.7 | 64.8 |
| 4519 ts,np | | 17.0x | 12.3x | 0.2x | 1.4x |
| 4520 ts,np | | 3.3x | 4.4x | 5.4x | 8.4x |
| 4521 | | 9.0 | 9.6 | 29.7 | 55.9 |
| 4522 | | 19.2 | 4.0 | 14.9 | 100.7 |
| 4523 | | 12.3 | 8.8 | 26.7 | 66.3 |
| 4524 | | 11.4 | 3.5 | 31.4 | 70.6 |
| 4525 | | 24.2 | 9.7 | 33.1 | 54.7 |

ts = terminal sacrifice, u1 = found dead, np = not pregnant, x = excluded from calculation

| Females | Body weight change during gestation - individual values (grams) | Appendix 8 |
|---|---|---|

| Animal Number | Phase Day | GES 0-4 | 4-7 | 7-14 | 14-21 |
|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | |
| 4526 | | 22.9 | 11.1 | 31.5 | 81.1 |
| Mean | | 17.0 | 8.1 | 27.8 | 62.5 |
| SD | | 4.80 | 4.10 | 5.14 | 24.35 |
| N | | 20 | 20 | 20 | 20 |

| Females | Body weight during lactation - individual values (grams) | Appendix 9 |
|---|---|---|

| Animal Number | Phase Day | LAC 1 | 4 | 7 | 14 | 21 |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | |
| 1501 ts | | 250.0 | 278.2 | 285.7 | 287.6 | 295.4 |
| 1502 ts | | 307.2 | 342.4 | 294.8 | 301.8 | 309.1 |
| 1503 ts | | 290.5 | 310.1 | 288.9 | 283.8 | 281.6 |
| 1505 ts | | 313.3 | 338.2 | 311.2 | 317.9 | 313.0 |
| 1506 ts | | 262.1 | 292.0 | 289.9 | 299.6 | 303.0 |
| 1507 ts | | 288.3 | 296.2 | 290.7 | 303.8 | 322.9 |
| 1508 ts | | 289.8 | 330.0 | 318.8 | 314.1 | 307.8 |
| 1509 tll | | 277.4 | | | | |
| 1510 ts | | 306.3 | 327.3 | 298.3 | 307.2 | 300.3 |
| 1511 ts | | 272.6 | 292.5 | 282.9 | 275.0 | 289.0 |
| 1513 tll | | 288.6 | | | | |
| 1514 ts | | 296.9 | 323.2 | 313.7 | 320.7 | 347.2 |
| 1515 ts | | 256.7 | 279.1 | 252.6 | 267.1 | 278.2 |
| 1516 ts | | 246.8 | 271.0 | 281.5 | 307.3 | 305.5 |
| 1517 ts | | 263.3 | 287.7 | 266.2 | 295.0 | 307.8 |
| 1518 ts | | 297.5 | 325.9 | 298.2 | 322.2 | 316.0 |
| 1519 ts | | 294.4 | 269.2 | 271.6 | 290.4 | 309.2 |
| 1520 ts | | 275.2 | 299.6 | 284.6 | 302.2 | 311.8 |
| 1522 tll | | 284.7 | 293.9 | 278.7 | 296.1 | |
| 1523 ts | | 306.1 | 340.6 | 321.9 | 318.7 | 316.6 |
| 1525 ts | | 298.8 | 317.6 | 296.8 | 292.2 | 327.9 |
| 1526 ts | | 273.3 | 314.5 | 301.5 | 310.4 | 320.4 |

ts = terminal sacrifice, tll = total litter loss

| Females | Body weight during lactation - individual values (grams) | Appendix 9 |
|---|---|---|

| Animal Number | Phase / Day | LAC 1 | 4 | 7 | 14 | 21 |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | |
| Mean | | 283.6 | 306.5 | 291.4 | 300.7 | 308.6 |
| SD | | 19.19 | 23.59 | 17.41 | 15.10 | 16.12 |
| N | | 22 | 20 | 20 | 20 | 19 |

| Females | Body weight during lactation - individual values (grams) | Appendix 9 |
|---|---|---|

| Animal Number | Phase Day | LAC 1 | 4 | 7 | 14 | 21 |
|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | |
| 2501 ts | | 308.0 | 332.1 | 301.3 | 310.1 | 316.0 |
| 2502 ts | | 260.8 | 282.5 | 303.3 | 305.1 | 321.2 |
| 2503 ts | | 268.7 | 294.4 | 272.2 | 284.6 | 282.6 |
| 2504 ts | | 337.0 | 340.1 | 348.3 | 342.9 | 361.7 |
| 2506 tll | | 261.5 | | | | |
| 2507 ts | | 249.8 | 294.0 | 283.5 | 292.5 | 310.0 |
| 2509 ts | | 278.2 | 320.5 | 306.9 | 310.4 | 327.7 |
| 2510 ts | | 274.5 | 287.7 | 290.1 | 289.9 | 306.3 |
| 2512 ts | | 294.2 | 315.7 | 288.4 | 289.8 | 297.4 |
| 2513 ts | | 287.8 | 328.4 | 319.5 | 322.7 | 333.3 |
| 2514 ts | | 295.0 | 309.5 | 294.6 | 298.8 | 311.0 |
| 2515 ts | | 278.8 | 291.0 | 302.9 | 315.2 | 318.6 |
| 2516 tll | | 268.3 | | | | |
| 2517 ts | | 257.5 | 265.4 | 260.5 | 289.6 | 291.8 |
| 2518 ts | | 281.9 | 302.8 | 271.0 | 282.0 | 298.0 |
| 2519 ts | | 259.3 | 275.8 | 254.8 | 287.5 | 279.5 |
| 2520 ts | | 310.4 | 311.1 | 292.0 | 291.9 | 305.2 |
| 2521 ts | | 270.9 | 311.4 | 282.8 | 299.4 | 311.5 |
| 2522 ts | | 306.9 | 324.3 | 298.8 | 324.9 | 354.2 |
| 2523 ts | | 241.7 | 282.8 | 273.3 | 273.9 | 283.9 |
| 2524 ts | | 279.0 | 326.4 | 297.0 | 304.1 | 287.6 |
| 2526 tll | | 252.3 | | | | |

ts = terminal sacrifice, tll = total litter loss

| Females | Body weight during lactation - individual values (grams) | Appendix 9 |
|---|---|---|

| Animal Number | Phase / Day | LAC 1 | 4 | 7 | 14 | 21 |
|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | |
| Mean | | 278.3 | 305.0 | 291.6 | 300.8 | 310.4 |
| SD | | 23.18 | 21.02 | 21.46 | 17.13 | 22.67 |
| N | | 22 | 19 | 19 | 19 | 19 |

| Females | Body weight during lactation - individual values (grams) | Appendix 9 |
|---|---|---|

| Animal Number | Phase Day | LAC 1 | 4 | 7 | 14 | 21 |
|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | |
| 3501 ts | | 306.2 | 327.3 | 298.8 | 330.6 | 330.1 |
| 3503 ts | | 247.9 | 254.4 | 251.9 | 263.1 | 280.7 |
| 3504 tll | | 247.0 | | | | |
| 3505 ts | | 308.7 | 333.9 | 330.4 | 339.9 | 335.6 |
| 3506 ts | | 301.0 | 287.3 | 287.9 | 299.1 | 317.8 |
| 3507 ts | | 260.4 | 286.7 | 291.0 | 316.1 | 315.4 |
| 3508 ts | | 236.4 | 260.7 | 252.6 | 279.3 | 283.1 |
| 3509 ts | | 315.5 | 330.8 | 309.4 | 322.6 | 333.4 |
| 3510 ts | | 320.4 | 340.3 | 322.7 | 335.7 | 344.4 |
| 3511 ts | | 305.3 | 311.2 | 285.2 | 285.4 | 288.1 |
| 3512 ts | | 350.2 | 377.1 | 348.6 | 365.9 | 359.5 |
| 3513 ts | | 335.1 | 339.9 | 314.8 | 328.2 | 342.7 |
| 3514 ts | | 302.6 | 322.5 | 305.6 | 307.0 | 303.7 |
| 3515 ts | | 268.9 | 273.3 | 263.9 | 267.8 | 282.2 |
| 3516 ts | | 286.0 | 311.4 | 292.6 | 304.9 | 319.4 |
| 3518 ts | | 302.6 | 335.8 | 333.3 | 351.2 | 366.0 |
| 3520 ts | | 336.1 | 361.3 | 338.3 | 335.6 | 357.7 |
| 3521 tll | | 232.1 | | | | |
| 3522 ts | | 281.1 | 307.1 | 290.1 | 307.7 | 331.0 |
| 3523 ts | | 275.3 | 291.8 | 280.4 | 306.5 | 310.9 |
| 3525 ts | | 282.8 | 282.4 | 292.9 | 285.6 | 311.6 |
| 3526 ts | | 343.8 | 343.9 | 311.5 | 325.8 | 320.9 |

ts = terminal sacrifice, tll = total litter loss

| Females | Body weight during lactation - individual values (grams) | Appendix 9 |
|---|---|---|

| Animal Number | Phase Day | LAC 1 | 4 | 7 | 14 | 21 |
|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | |
| Mean | | 293.0 | 314.0 | 300.1 | 312.9 | 321.7 |
| SD | | 34.42 | 33.20 | 26.90 | 27.49 | 25.75 |
| N | | 22 | 20 | 20 | 20 | 20 |

| Females | Body weight during lactation - individual values (grams) | Appendix 9 |
|---|---|---|

| Animal Number | Phase / Day | LAC 1 | 4 | 7 | 14 | 21 |
|---|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | | |
| 4501 ts | | 282.6 | 309.9 | 301.0 | 314.4 | 318.2 |
| 4502 ts | | 303.0 | 307.7 | 302.2 | 301.4 | 315.3 |
| 4503 ts | | 293.4 | 301.9 | 309.2 | 321.1 | 313.1 |
| 4504 ts | | 268.9 | 284.0 | 275.3 | 282.5 | 291.9 |
| 4505 ts | | 308.7 | 311.8 | 300.9 | 308.0 | 322.5 |
| 4509 ts | | 304.3 | 301.7 | 300.3 | 292.5 | 316.2 |
| 4510 ts | | 307.3 | 343.3 | 332.8 | 338.1 | 326.6 |
| 4512 ts | | 285.8 | 308.8 | 299.8 | 300.8 | 313.8 |
| 4513 ts | | 255.4 | 264.5 | 273.1 | 282.9 | 295.2 |
| 4515 ts | | 310.9 | 350.8 | 349.2 | 330.4 | 325.2 |
| 4516 ts | | 281.3 | 303.3 | 285.0 | 298.5 | 311.5 |
| 4517 ts | | 279.7 | 298.3 | 291.0 | 300.4 | 291.0 |
| 4518 ts | | 306.3 | 314.5 | 307.0 | 333.1 | 332.0 |
| 4521 ts | | 263.7 | 280.5 | 294.3 | 296.5 | 299.7 |
| 4522 ts | | 280.4 | 296.3 | 293.0 | 297.5 | 304.4 |
| 4523 ts | | 260.0 | 285.1 | 282.8 | 273.4 | 299.0 |
| 4524 ts | | 284.1 | 306.8 | 300.8 | 300.9 | 307.9 |
| 4525 ts | | 277.0 | 294.3 | 304.6 | 294.9 | 327.1 |
| 4526 ts | | 274.5 | 288.9 | 274.0 | 280.9 | 297.4 |
| Mean | | 285.6 | 302.8 | 298.8 | 302.5 | 310.9 |
| SD | | 17.32 | 20.07 | 18.74 | 18.02 | 12.72 |
| N | | 19 | 19 | 19 | 19 | 19 |

ts = terminal sacrifice

| Females | Body weight change during lactation - individual values (grams) | Appendix 10 |
|---|---|---|

| Animal Number | Phase Day | LAC 1-4 | 4-7 | 7-14 | 14-21 |
|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | |
| 1501 ts | | 28.2 | 7.5 | 1.9 | 7.8 |
| 1502 ts | | 35.2 | -47.6 | 7.0 | 7.3 |
| 1503 ts | | 19.6 | -21.2 | -5.1 | -2.2 |
| 1505 ts | | 24.9 | -27.0 | 6.7 | -4.9 |
| 1506 ts | | 29.9 | -2.1 | 9.7 | 3.4 |
| 1507 ts | | 7.9 | -5.5 | 13.1 | 19.1 |
| 1508 ts | | 40.2 | -11.2 | -4.7 | -6.3 |
| 1510 ts | | 21.0 | -29.0 | 8.9 | -6.9 |
| 1511 ts | | 19.9 | -9.6 | -7.9 | 14.0 |
| 1514 ts | | 26.3 | -9.5 | 7.0 | 26.5 |
| 1515 ts | | 22.4 | -26.5 | 14.5 | 11.1 |
| 1516 ts | | 24.2 | 10.5 | 25.8 | -1.8 |
| 1517 ts | | 24.4 | -21.5 | 28.8 | 12.8 |
| 1518 ts | | 28.4 | -27.7 | 24.0 | -6.2 |
| 1519 ts | | -25.2 | 2.4 | 18.8 | 18.8 |
| 1520 ts | | 24.4 | -15.0 | 17.6 | 9.6 |
| 1522 tll | | 9.2 | -15.2 | 17.4 | |
| 1523 ts | | 34.5 | -18.7 | -3.2 | -2.1 |
| 1525 ts | | 18.8 | -20.8 | -4.6 | 35.7 |
| 1526 ts | | 41.2 | -13.0 | 8.9 | 10.0 |
| Mean | | 22.8 | -15.0 | 9.2 | 7.7 |
| SD | | 14.17 | 13.80 | 10.90 | 11.88 |
| N | | 20 | 20 | 20 | 19 |

ts = terminal sacrifice, tll = total litter loss

| Females | Body weight change during lactation - individual values (grams) | Appendix 10 |
|---|---|---|

| Animal Number | Phase Day | LAC 1-4 | 4-7 | 7-14 | 14-21 |
|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | |
| 2501 ts | | 24.1 | -30.8 | 8.8 | 5.9 |
| 2502 ts | | 21.7 | 20.8 | 1.8 | 16.1 |
| 2503 ts | | 25.7 | -22.2 | 12.4 | -2.0 |
| 2504 ts | | 3.1 | 8.2 | -5.4 | 18.8 |
| 2507 ts | | 44.2 | -10.5 | 9.0 | 17.5 |
| 2509 ts | | 42.3 | -13.6 | 3.5 | 17.3 |
| 2510 ts | | 13.2 | 2.4 | -0.2 | 16.4 |
| 2512 ts | | 21.5 | -27.3 | 1.4 | 7.6 |
| 2513 ts | | 40.6 | -8.9 | 3.2 | 10.6 |
| 2514 ts | | 14.5 | -14.9 | 4.2 | 12.2 |
| 2515 ts | | 12.2 | 11.9 | 12.3 | 3.4 |
| 2517 ts | | 7.9 | -4.9 | 29.1 | 2.2 |
| 2518 ts | | 20.9 | -31.8 | 11.0 | 16.0 |
| 2519 ts | | 16.5 | -21.0 | 32.7 | -8.0 |
| 2520 ts | | 0.7 | -19.1 | -0.1 | 13.3 |
| 2521 ts | | 40.5 | -28.6 | 16.6 | 12.1 |
| 2522 ts | | 17.4 | -25.5 | 26.1 | 29.3 |
| 2523 ts | | 41.1 | -9.5 | 0.6 | 10.0 |
| 2524 ts | | 47.4 | -29.4 | 7.1 | -16.5 |
| Mean | | 24.0 | -13.4 | 9.2 | 9.6 |
| SD | | 14.61 | 15.42 | 10.51 | 10.51 |
| N | | 19 | 19 | 19 | 19 |

ts = terminal sacrifice

| Females | Body weight change during lactation - individual values (grams) | Appendix 10 |
|---|---|---|

| Animal Number | Phase Day | LAC 1-4 | 4-7 | 7-14 | 14-21 |
|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | |
| 3501 ts | | 21.1 | -28.5 | 31.8 | -0.5 |
| 3503 ts | | 6.5 | -2.5 | 11.2 | 17.6 |
| 3505 ts | | 25.2 | -3.5 | 9.5 | -4.3 |
| 3506 ts | | -13.7 | 0.6 | 11.2 | 18.7 |
| 3507 ts | | 26.3 | 4.3 | 25.1 | -0.7 |
| 3508 ts | | 24.3 | -8.1 | 26.7 | 3.8 |
| 3509 ts | | 15.3 | -21.4 | 13.2 | 10.8 |
| 3510 ts | | 19.9 | -17.6 | 13.0 | 8.7 |
| 3511 ts | | 5.9 | -26.0 | 0.2 | 2.7 |
| 3512 ts | | 26.9 | -28.5 | 17.3 | -6.4 |
| 3513 ts | | 4.8 | -25.1 | 13.4 | 14.5 |
| 3514 ts | | 19.9 | -16.9 | 1.4 | -3.3 |
| 3515 ts | | 4.4 | -9.4 | 3.9 | 14.4 |
| 3516 ts | | 25.4 | -18.8 | 12.3 | 14.5 |
| 3518 ts | | 33.2 | -2.5 | 17.9 | 14.8 |
| 3520 ts | | 25.2 | -23.0 | -2.7 | 22.1 |
| 3522 ts | | 26.0 | -17.0 | 17.6 | 23.3 |
| 3523 ts | | 16.5 | -11.4 | 26.1 | 4.4 |
| 3525 ts | | -0.4 | 10.5 | -7.3 | 26.0 |
| 3526 ts | | 0.1 | -32.4 | 14.3 | -4.9 |
| Mean | | 15.6 | -13.9 | 12.8 | 8.8 |
| SD | | 12.26 | 12.14 | 10.22 | 10.23 |
| N | | 20 | 20 | 20 | 20 |

ts = terminal sacrifice

| Females | Body weight change during lactation - individual values (grams) | Appendix 10 |
|---|---|---|

| Animal Number | Phase Day | LAC 1-4 | 4-7 | 7-14 | 14-21 |
|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | |
| 4501 ts | | 27.3 | -8.9 | 13.4 | 3.8 |
| 4502 ts | | 4.7 | -5.5 | -0.8 | 13.9 |
| 4503 ts | | 8.5 | 7.3 | 11.9 | -8.0 |
| 4504 ts | | 15.1 | -8.7 | 7.2 | 9.4 |
| 4505 ts | | 3.1 | -10.9 | 7.1 | 14.5 |
| 4509 ts | | -2.6 | -1.4 | -7.8 | 23.7 |
| 4510 ts | | 36.0 | -10.5 | 5.3 | -11.5 |
| 4512 ts | | 23.0 | -9.0 | 1.0 | 13.0 |
| 4513 ts | | 9.1 | 8.6 | 9.8 | 12.3 |
| 4515 ts | | 39.9 | -1.6 | -18.8 | -5.2 |
| 4516 ts | | 22.0 | -18.3 | 13.5 | 13.0 |
| 4517 ts | | 18.6 | -7.3 | 9.4 | -9.4 |
| 4518 ts | | 8.2 | -7.5 | 26.1 | -1.1 |
| 4521 ts | | 16.8 | 13.8 | 2.2 | 3.2 |
| 4522 ts | | 15.9 | -3.3 | 4.5 | 6.9 |
| 4523 ts | | 25.1 | -2.3 | -9.4 | 25.6 |
| 4524 ts | | 22.7 | -6.0 | 0.1 | 7.0 |
| 4525 ts | | 17.3 | 10.3 | -9.7 | 32.2 |
| 4526 ts | | 14.4 | -14.9 | 6.9 | 16.5 |
| Mean | | 17.1 | -4.0 | 3.8 | 8.4 |
| SD | | 10.82 | 8.62 | 10.27 | 12.01 |
| N | | 19 | 19 | 19 | 19 |

ts = terminal sacrifice

| Males | Food consumption during premating, mating and postmating periods - individual values (grams/animal/day) | Appendix 11 |
|---|---|---|

| Cage Number | Phase / Week | . | PRE 1-2 | PRC 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | |
| 1 | | | 25.0 | 27.6 | 29.2 | 29.5 | 30.2 | 31.0 | 30.5 | 28.3 | 27.2 | 26.6 | 28.2 |
| 2 | | | 24.2 | 27.1 | 27.3 | 27.8 | 29.0 | 30.4 | 30.7 | 29.1 | 28.5 | 27.4 | 28.4 |
| 3 | | | 25.0 | 27.7 | 26.0 | 27.2 | 28.9 | 29.0 | 28.7 | 27.6 | 27.9 | 27.2 | 27.9 |
| 4 | | | 24.1 | 26.4 | 27.4 | 28.7 | 31.0 | 31.5 | 30.6 | 30.2 | 29.6 | 29.0 | nw |
| 5 | | | 24.5 | 26.0 | 28.1 | 30.6 | 31.6 | 30.7 | 30.5 | 29.1 | 28.2 | 30.0 | 28.5 |
| 6 | | | 24.5 | 27.4 | 26.4 | 27.5 | 29.0 | 30.6 | 30.4 | 27.8 | 28.8 | 26.9 | 26.7 |
| 7 | | | 26.5 | 29.3 | 30.5 | 32.1 | 32.5 | 32.7 | 32.5 | 31.4 | 31.0 | 26.7 | 34.2 |
| 8 | | | 24.1 | 27.0 | 27.8 | 29.2 | 27.3 | 30.1 | 27.9 | 27.8 | 27.5 | 28.2 | 29.1 |
| 9 | | | 23.7 | 25.8 | 25.9 | 25.5 | 26.1 | 27.3 | 27.1 | 26.2 | 25.9 | 26.1 | 27.0 |
| 10 | | | 22.7 | 26.2 | 26.6 | 28.0 | 28.8 | 30.8 | 30.8 | 27.6 | 28.9 | 26.7 | 28.3 |
| 11 | | | 24.1 | 25.9 | 26.5 | 29.7 | 29.5 | 31.2 | 29.6 | 29.2 | 30.7 | 28.3 | 29.6 |
| 12 | | | 25.6 | 26.4 | 27.8 | 28.3 | 30.2 | 30.3 | 30.4 | 30.0 | 29.0 | 27.4 | 29.0 |
| 13 | | | 26.1 | 26.0 | 25.3 | 25.9 | 28.0 | 29.0 | 28.1 | 27.1 | 26.7 | 27.2 | 28.9 |
| Mean | | | 24.6 | 26.8 | 27.3 | 28.4 | 29.4 | 30.4 | 29.8 | 28.6 | 28.4 | 27.5 | 28.8 |
| SD | | | 1.02 | 0.99 | 1.42 | 1.82 | 1.75 | 1.34 | 1.48 | 1.43 | 1.47 | 1.10 | 1.90 |
| N | | | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 12 |

nw = not weighed

| Males | Food consumption during premating, mating and postmating periods - individual values (grams/animal/day) | Appendix 11 |
|---|---|---|

| Cage Number | Phase / Week | . | PRE 1-2 | PRC 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | |
| 14 | | | 24.5 | 27.9 | 28.4 | 28.6 | 29.1 | 30.0 | 29.4 | 28.9 | 27.9 | 27.3 | 27.4 |
| 15 | | | 22.2 | 23.7 | 27.2 | 24.6 | 25.3 | 27.6 | 26.2 | 27.1 | 26.5 | 26.4 | 27.4 |
| 16 | | | 23.4 | 28.0 | 26.3 | 26.4 | 27.7 | 29.3 | 29.3 | 28.5 | 28.8 | 26.7 | 27.8 |
| 17 | | | 24.5 | 26.4 | 26.8 | 27.5 | 28.4 | 29.3 | 27.4 | 26.4 | 29.1 | 27.6 | 29.1 |
| 18 | | | 23.5 | 27.2 | 27.7 | 28.5 | 30.5 | 29.4 | 27.9 | 21.9 | 23.3 | 29.7 | 31.2 |
| 19 | | | 21.4 | 24.0 | 25.7 | 27.1 | 28.8 | 30.1 | 27.9 | 29.5 | 27.7 | 28.3 | 29.3 |
| 20 | | | 25.7 | 30.1 | 31.5 | 32.6 | 33.0 | 34.4 | 32.3 | 32.3 | 29.8 | 31.0 | 32.7 |
| 21 | | | 22.0 | 26.6 | 26.9 | 29.3 | 28.3 | 28.8 | 27.7 | 27.2 | 27.2 | 27.0 | 26.5 |
| 22 | | | 22.3 | 26.2 | 27.9 | 28.9 | 30.4 | 31.1 | 30.3 | 31.2 | 30.7 | 29.8 | 30.2 |
| 23 | | | 26.9 | 30.1 | 30.2 | 30.1 | 31.7 | 31.5 | 30.1 | 30.7 | 30.1 | 30.0 | 30.7 |
| 24 | | | 24.3 | 27.7 | 28.5 | 29.9 | 31.8 | 31.2 | 31.2 | 31.5 | 30.2 | 29.4 | 31.9 |
| 25 | | | 25.6 | 29.0 | 28.2 | 30.0 | 29.3 | 30.1 | 29.1 | 30.4 | 29.9 | 26.9 | 27.8 |
| 26 | | | 24.3 | 26.6 | 26.4 | 27.1 | 27.6 | 27.4 | 26.4 | 26.2 | 25.5 | 25.6 | 25.7 |
| Mean | | | 23.9 | 27.2 | 27.8 | 28.5 | 29.4 | 30.0 | 28.9 | 28.6 | 28.2 | 28.1 | 29.1 |
| SD | | | 1.62 | 1.97 | 1.61 | 2.01 | 2.09 | 1.81 | 1.82 | 2.84 | 2.15 | 1.69 | 2.16 |
| N | | | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |

| Males | Food consumption during premating, mating and postmating periods - individual values (grams/animal/day) | Appendix 11 |
|---|---|---|

| Cage Number | Phase / Week | . | PRE 1-2 | PRC 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | |
| 27 | | | 25.2 | 27.6 | 28.3 | 29.0 | 31.2 | 25.4 | 28.7 | 29.1 | 28.2 | 27.9 | 25.0 |
| 28 | | | 25.9 | 28.5 | 28.9 | 29.0 | 29.8 | 30.1 | 29.0 | 29.4 | 28.8 | 29.0 | 29.8 |
| 29 | | | 22.1 | 25.9 | 27.7 | 27.4 | 29.2 | 30.4 | 29.5 | 29.4 | 28.1 | 28.8 | 29.8 |
| 30 | | | 21.9 | 25.1 | 26.2 | 26.6 | 27.5 | 27.5 | 27.0 | 25.7 | 26.2 | 25.8 | 27.0 |
| 31 | | | 25.1 | 29.1 | 27.5 | 29.5 | 30.2 | 30.6 | 29.7 | 30.9 | 29.7 | 30.6 | 31.7 |
| 32 | | | 22.2 | 25.9 | 25.1 | 27.3 | 27.9 | 28.8 | 28.6 | 29.3 | 28.1 | 28.2 | 29.4 |
| 33 | | | 24.1 | 28.5 | 28.1 | 28.3 | 29.1 | 29.8 | 28.6 | 28.2 | 28.6 | 28.9 | 28.2 |
| 34 | | | 22.0 | 23.6 | 24.5 | 25.4 | 25.6 | 27.1 | 26.5 | 25.4 | 25.8 | 26.2 | 26.9 |
| 35 | | | 26.4 | 31.8 | 32.6 | 34.1 | 35.7 | 36.9 | 33.4 | 33.0 | 36.7 | 33.3 | 33.9 |
| 36 | | | 25.6 | 30.5 | 27.9 | 29.1 | 30.6 | 32.0 | 31.2 | 30.9 | 28.4 | 31.1 | 32.9 |
| 37 | | | 23.8 | 27.2 | 24.0 | 26.7 | 27.7 | 28.7 | 28.9 | 30.6 | 28.0 | 28.1 | 29.0 |
| 38 | | | 23.4 | 26.5 | 26.5 | 27.2 | 29.7 | 28.8 | 27.7 | 27.2 | 25.9 | 24.7 | 27.0 |
| 39 | | | 24.5 | 28.4 | 27.0 | 27.2 | 27.9 | 28.6 | 27.2 | 26.6 | 26.8 | 26.4 | 27.6 |
| Mean | | | 24.0 | 27.6 | 27.2 | 28.2 | 29.4 | 29.6 | 28.9 | 28.9 | 28.4 | 28.4 | 29.1 |
| SD | | | 1.59 | 2.22 | 2.22 | 2.14 | 2.44 | 2.78 | 1.84 | 2.22 | 2.77 | 2.35 | 2.57 |
| N | | | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |

| Males | Food consumption during premating, mating and postmating periods - individual values (grams/animal/day) | Appendix 11 |
|---|---|---|

| Cage Number | Phase / Week | . | PRE 1-2 | PRC 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | |
| 40 | | | 22.1 | 25.6 | 26.5 | 26.4 | 28.2 | 28.1 | 28.4 | 28.4 | 27.4 | 27.5 | 27.1 |
| 41 | | | 24.9 | 27.9 | 29.8 | 29.4 | 30.8 | 30.5 | 28.6 | 29.1 | 29.9 | 29.3 | 27.3 |
| 42 | | | 23.0 | 26.4 | 25.9 | 27.0 | 28.2 | 27.9 | 28.5 | 28.8 | 27.7 | 28.3 | 27.9 |
| 43 | | | 25.7 | 27.1 | 26.8 | 26.8 | 28.6 | 28.8 | 29.3 | 28.2 | 27.1 | 27.9 | 27.2 |
| 44 | | | 27.2 | 30.6 | 31.4 | 31.5 | 32.9 | 33.4 | 34.0 | 32.4 | 30.4 | 29.4 | 30.9 |
| 45 | | | 27.7 | 30.8 | 32.6 | 34.0 | 34.7 | 34.4 | 36.4 | 34.4 | 35.5 | 32.2 | 32.9 |
| 46 | | | 22.9 | 24.6 | 24.5 | 25.3 | 27.0 | 27.7 | 26.9 | 27.9 | 26.8 | 28.6 | 26.8 |
| 47 | | | 23.9 | 27.6 | 27.7 | 29.2 | 31.2 | 31.2 | 30.7 | 31.1 | 30.4 | 29.8 | 29.8 |
| 48 | | | 25.1 | 28.6 | 30.1 | 30.0 | 31.1 | 31.8 | 30.0 | 31.8 | 30.4 | 30.4 | 31.0 |
| 49 | | | 22.7 | 26.6 | 25.2 | 26.8 | 28.3 | 28.7 | 29.1 | 29.4 | 28.8 | 29.1 | 28.5 |
| 50 | | | 25.1 | 28.3 | 30.4 | 32.0 | 35.2 | 32.1 | 32.9 | 32.9 | 39.2 | 38.2 | 37.1 |
| 51 | | | 22.1 | 24.1 | 24.6 | 25.9 | 27.2 | 29.7 | 27.0 | 27.6 | 26.8 | 27.5 | 26.7 |
| 52 | | | 25.5 | 28.6 | 27.2 | 26.9 | 28.8 | 29.6 | 29.2 | 29.0 | 27.9 | 28.2 | 28.7 |
| Mean | | | 24.5 | 27.4 | 27.9 | 28.5 | 30.2 | 30.3 | 30.1 | 30.1 | 29.9 | 29.7 | 29.4 |
| SD | | | 1.85 | 2.03 | 2.68 | 2.70 | 2.74 | 2.16 | 2.78 | 2.19 | 3.67 | 2.86 | 3.00 |
| N | | | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |

| Males | Food consumption during premating, mating and postmating periods - individual values (grams/animal/day) | Appendix 11 |
|---|---|---|

| Cage Number | Phase / Week | PMT 1-2 | 2-3 | 3 |
|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | |
| 1 | | 26.6 | 26.7 | 29.1 |
| 2 | | 26.7 | 28.0 | 29.4 |
| 3 | | 24.8 | 26.6 | 28.6 |
| 4 | | 29.2 | 27.5 | 30.4 |
| 5 | | 28.9 | 24.8 | 27.6 |
| 6 | | 28.6 | 28.4 | 31.9 |
| 7 | | 28.0 | 29.2 | 30.1 |
| 8 | | 26.4 | 25.4 | 25.9 |
| 9 | | 24.5 | 24.5 | 25.8 |
| 10 | | 28.6 | 27.1 | 29.1 |
| 11 | | 27.5 | 27.8 | 28.7 |
| 12 | | 26.5 | 26.4 | 29.6 |
| 13 | | 26.0 | 26.7 | 26.5 |
| Mean | | 27.1 | 26.9 | 28.7 |
| SD | | 1.52 | 1.38 | 1.80 |
| N | | 13 | 13 | 13 |

| Males | Food consumption during premating, mating and postmating periods - individual values (grams/animal/day) | Appendix 11 |
|---|---|---|

| Cage Number | Phase Week | PMT 1-2 | 2-3 | 3 |
|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | |
| 14 | | 26.9 | 26.4 | 27.1 |
| 15 | | 25.7 | 27.0 | 27.8 |
| 16 | | 25.9 | 25.6 | 27.8 |
| 17 | | 26.6 | 25.9 | 27.5 |
| 18 | | 27.7 | 26.2 | 28.0 |
| 19 | | 28.7 | 27.8 | 29.8 |
| 20 | | 29.5 | 30.5 | 30.2 |
| 21 | | 26.0 | 25.7 | 27.3 |
| 22 | | 27.6 | 26.4 | 31.2 |
| 23 | | 31.0 | 29.4 | 30.8 |
| 24 | | 30.1 | 30.1 | 33.6 |
| 25 | | 26.5 | 30.2 | 31.2 |
| 26 | | 24.0 | 23.1 | 24.5 |
| Mean | | 27.4 | 27.3 | 29.0 |
| SD | | 1.97 | 2.22 | 2.39 |
| N | | 13 | 13 | 13 |

| Males | Food consumption during premating, mating and postmating periods - individual values (grams/animal/day) | Appendix 11 |
|---|---|---|

| Cage Number | Phase Week | PMT 1-2 | 2-3 | 3 |
|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | |
| 27 | | 26.5 | 24.7 | 24.4 |
| 28 | | 23.8 | 27.7 | 28.4 |
| 29 | | 28.9 | 26.8 | 28.7 |
| 30 | | 23.9 | 26.2 | 28.4 |
| 31 | | 29.2 | 29.7 | 32.5 |
| 32 | | 28.2 | 27.7 | 29.9 |
| 33 | | 26.9 | 27.2 | 30.9 |
| 34 | | 25.8 | 27.3 | 28.1 |
| 35 | | 33.1 | 34.5 | 35.4 |
| 36 | | 30.8 | 30.9 | 31.6 |
| 37 | | 28.1 | 27.0 | 25.1 |
| 38 | | 24.2 | 26.0 | 28.4 |
| 39 | | 25.9 | 26.6 | 27.7 |
| Mean | | 27.3 | 27.9 | 29.2 |
| SD | | 2.76 | 2.54 | 2.94 |
| N | | 13 | 13 | 13 |

| Males | Food consumption during premating, mating and postmating periods - individual values (grams/animal/day) | Appendix 11 |
|---|---|---|

| Cage Number | Phase Week | PMT 1-2 | 2-3 | 3 |
|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | |
| 40 | | 25.2 | 26.1 | 25.3 |
| 41 | | 26.6 | 28.2 | 29.6 |
| 42 | | 27.3 | 26.3 | 28.1 |
| 43 | | 24.0 | 25.8 | 27.2 |
| 44 | | 29.1 | 29.6 | 30.5 |
| 45 | | 32.9 | 32.0 | 33.2 |
| 46 | | 24.7 | 24.7 | 26.0 |
| 47 | | 27.1 | 29.0 | 30.0 |
| 48 | | 27.7 | 31.1 | 32.2 |
| 49 | | 26.9 | 27.9 | 27.5 |
| 50 | | 34.2 | 34.4 | 37.2 |
| 51 | | 25.0 | 27.2 | 28.5 |
| 52 | | 26.7 | 25.7 | 27.9 |
| Mean | | 27.5 | 28.3 | 29.5 |
| SD | | 3.04 | 2.82 | 3.24 |
| N | | 13 | 13 | 13 |

| Females | Food consumption during premating, mating and postmating periods - individual values (grams/animal/day) | Appendix 11 |
|---|---|---|

| Cage Number | Phase / Week | . | PRE 1-2 | PRC 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | |
| 14 | | | 17.0 | 18.0 | 17.6 | 18.5 | 18.9 | 18.5 | 18.2 | 18.4 | 17.6 | 17.1 | 17.0 |
| 15 | | | 18.5 | 19.8 | 19.6 | 21.1 | 20.7 | 21.3 | 19.7 | 19.3 | 19.0 | 17.0 | 17.5 |
| 16 | | | 18.2 | 18.2 | 18.8 | 19.1 | 19.9 | 20.3 | 20.3 | 18.8 | 18.5 | 18.9 | 17.9 |
| 17 | | | 17.3 | 19.0 | 19.2 | 20.5 | 19.9 | 20.7 | 20.0 | 19.5 | 18.7 | 18.1 | 18.3 |
| 18 | | | 18.2 | 18.2 | 18.2 | 19.0 | 18.8 | 19.2 | 19.3 | 18.5 | 17.6 | 17.1 | 17.4 |
| 19 | | | 18.0 | 18.6 | 18.9 | 20.4 | 19.5 | 18.5 | 19.7 | 19.6 | 19.1 | 17.5 | 18.3 |
| 20 | | | 17.9 | 19.9 | 21.0 | 21.1 | 21.7 | 22.3 | 22.3 | 20.2 | 20.6 | 19.8 | 20.5 |
| 21 | | | 17.2 | 17.7 | 17.2 | 17.4 | 17.8 | 17.2 | 17.2 | 16.4 | 17.2 | 15.8 | 16.0 |
| 22 | | | 18.6 | 20.8 | 20.6 | 21.2 | 20.7 | 22.3 | 21.4 | 21.0 | 19.8 | 18.9 | 19.8 |
| 23 | | | 17.1 | 18.6 | 17.8 | 18.6 | 18.9 | 17.6 | 18.2 | 17.6 | 16.3 | 15.6 | 16.5 |
| 24 | | | 17.4 | 17.5 | 17.4 | 18.1 | 18.0 | 18.5 | 18.2 | 17.8 | 16.6 | 16.4 | 16.0 |
| 25 | | | 16.4 | 17.6 | 17.5 | 18.6 | 19.9 | 18.6 | 19.0 | 18.1 | 17.0 | 17.0 | 16.6 |
| 26 | | | 17.3 | 18.6 | 18.4 | 18.9 | 19.3 | 19.1 | 19.9 | 19.6 | 19.2 | 17.4 | 18.0 |
| Mean | | | 17.6 | 18.6 | 18.6 | 19.4 | 19.5 | 19.5 | 19.5 | 18.8 | 18.3 | 17.4 | 17.7 |
| SD | | | 0.67 | 1.00 | 1.23 | 1.27 | 1.10 | 1.67 | 1.41 | 1.21 | 1.32 | 1.22 | 1.35 |
| N | | | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |

| Females | Food consumption during premating, mating and postmating periods - individual values (grams/animal/day) | Appendix 11 |
|---|---|---|

| Cage Number | Phase / Week | . | PRE 1-2 | PRC 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | |
| 40 | | | 15.8 | 18.1 | 17.9 | 20.4 | 19.7 | 19.4 | 19.0 | 19.0 | 17.9 | 17.3 | 17.4 |
| 41 | | | 18.1 | 18.7 | 19.8 | 19.4 | 20.3 | 21.1 | 20.3 | 19.6 | 19.1 | 18.5 | 18.6 |
| 42 | | | 17.3 | 18.2 | 18.3 | 19.1 | 20.1 | 19.5 | 18.5 | 18.7 | 17.3 | 16.8 | 16.9 |
| 43 | | | 16.3 | 17.5 | 18.0 | 18.6 | 18.8 | 19.2 | 18.4 | 19.5 | 18.0 | 16.6 | 17.2 |
| 44 | | | 17.9 | 19.5 | 19.2 | 19.5 | 19.9 | 19.8 | 19.4 | 19.2 | 18.4 | 18.3 | 18.2 |
| 45 | | | 17.1 | 18.6 | 18.7 | 23.7 | 21.9 | 20.3 | 20.4 | 23.9 | 25.5 | 18.6 | 19.9 |
| 46 | | | 18.5 | 20.0 | 19.6 | 20.5 | 19.9 | 19.9 | 18.7 | 19.1 | 18.6 | 17.2 | 17.8 |
| 47 | | | 18.5 | 20.1 | 20.3 | 20.8 | 21.3 | 22.0 | 22.1 | 20.7 | 19.1 | 21.0 | 21.1 |
| 48 | | | 17.8 | 18.7 | 18.2 | 19.2 | 19.1 | 18.3 | 17.9 | 18.9 | 22.8 | 16.3 | 16.0 |
| 49 | | | 17.2 | 19.5 | 19.4 | 19.6 | 19.9 | 19.6 | 19.0 | 18.9 | 17.9 | 17.0 | 17.9 |
| 50 | | | 17.9 | 20.1 | 20.7 | 20.2 | 21.0 | 21.5 | 19.7 | 20.8 | 19.5 | 19.0 | 21.7 |
| 51 | | | 16.4 | 19.0 | 19.1 | 19.8 | 20.4 | nw | 19.8 | 19.0 | 18.2 | 18.4 | 18.5 |
| 52 | | | 17.8 | 20.1 | 19.9 | 21.0 | 21.1 | 22.0 | 19.7 | 19.9 | 19.6 | 19.1 | 19.1 |
| Mean | | | 17.4 | 19.1 | 19.2 | 20.1 | 20.3 | 20.2 | 19.4 | 19.8 | 19.4 | 18.0 | 18.5 |
| SD | | | 0.85 | 0.86 | 0.90 | 1.28 | 0.88 | 1.19 | 1.09 | 1.41 | 2.28 | 1.30 | 1.63 |
| N | | | 13 | 13 | 13 | 13 | 13 | 12 | 13 | 13 | 13 | 13 | 13 |

nw = not weighed

| Females | Food consumption during premating, mating and postmating periods - individual values (grams/animal/day) | Appendix 11 |
|---|---|---|

| Cage Number | Phase Week | . | PRE 1-2 | PRC 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | |
| 66 | | | 16.3 | 18.1 | 16.7 | 17.6 | 18.2 | 18.5 | 18.4 | 18.3 | 17.9 | 17.9 | 17.0 |
| 67 | | | 16.4 | 17.7 | 18.1 | 19.0 | 19.4 | 18.7 | 18.3 | 18.7 | 18.6 | 19.0 | 17.6 |
| 68 | | | 16.4 | 17.4 | 18.0 | 18.5 | 18.4 | 18.6 | 18.7 | 19.0 | 18.3 | 17.9 | 17.4 |
| 69 | | | 15.6 | 16.9 | 16.8 | 16.4 | 16.9 | 16.9 | 16.1 | 16.5 | 15.1 | 15.6 | 15.0 |
| 70 | | | 17.9 | 19.7 | 19.5 | 19.9 | 21.2 | 21.5 | 21.2 | 20.3 | 20.4 | 19.2 | 18.2 |
| 71 | | | 16.9 | 18.4 | 17.2 | 18.0 | 27.2 | 19.5 | 19.1 | 20.4 | 19.4 | 18.7 | 17.3 |
| 72 | | | 17.0 | 19.8 | 19.7 | 20.5 | 20.5 | 22.2 | 21.0 | 20.0 | 19.4 | 20.1 | 20.1 |
| 73 | | | 17.4 | 19.2 | 18.1 | 19.3 | 19.0 | 19.1 | 17.7 | 17.6 | 16.9 | 17.2 | 16.3 |
| 56 | | | 17.8 | 19.5 | 19.7 | 20.5 | 20.1 | 22.0 | 19.6 | 20.7 | 19.8 | 18.9 | 19.3 |
| 75 | | | 17.7 | 21.1 | 20.8 | 21.6 | 22.1 | 19.2 | 21.7 | 22.2 | 20.7 | 20.2 | 19.5 |
| 76 | | | 15.7 | 16.8 | 17.4 | nw | 19.1 | 18.7 | 18.4 | 18.6 | 19.4 | 17.6 | 16.5 |
| 77 | | | 15.1 | 17.3 | 17.0 | 17.4 | 18.7 | 19.4 | 18.8 | 18.4 | 18.0 | 17.0 | 17.3 |
| 78 | | | 18.5 | 20.4 | 19.5 | 19.6 | 19.8 | 19.5 | 18.8 | 19.1 | 18.4 | 17.3 | 16.8 |
| Mean | | | 16.8 | 18.6 | 18.3 | 19.0 | 20.0 | 19.5 | 19.0 | 19.2 | 18.6 | 18.2 | 17.6 |
| SD | | | 1.01 | 1.40 | 1.35 | 1.51 | 2.55 | 1.52 | 1.54 | 1.49 | 1.50 | 1.30 | 1.40 |
| N | | | 13 | 13 | 13 | 12 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |

nw = not weighed

| Females | Food consumption during premating, mating and postmating periods - individual values (grams/animal/day) | Appendix 11 |
|---|---|---|

| Cage Number | Phase / Week | . | PRE 1-2 | PRC 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | |
| 92 | | | 16.8 | 18.2 | 18.1 | 19.0 | 20.0 | 20.6 | 19.1 | 19.3 | 18.5 | 18.1 | 17.0 |
| 93 | | | 18.9 | 19.2 | 19.1 | 19.3 | 20.0 | 20.4 | 18.7 | 18.1 | 17.9 | 16.7 | 16.5 |
| 94 | | | 16.5 | 18.1 | 17.9 | 19.0 | 18.9 | 20.9 | 18.4 | 20.1 | 19.7 | 19.1 | 18.4 |
| 95 | | | 16.0 | 17.7 | 18.6 | 19.6 | 20.7 | 20.8 | 18.9 | 20.0 | 20.0 | 19.8 | 19.5 |
| 96 | | | 18.4 | 19.1 | 18.5 | 19.2 | 19.5 | 20.8 | 19.0 | 18.9 | 19.2 | 18.8 | 16.9 |
| 97 | | | 16.8 | 17.2 | 16.9 | 18.1 | 18.3 | 19.6 | 18.2 | 18.5 | 18.7 | 18.1 | 17.4 |
| 98 | | | 16.1 | 17.9 | 17.4 | 18.6 | 18.6 | 19.7 | 18.6 | 18.4 | 18.2 | 19.3 | 17.7 |
| 99 | | | 16.3 | 17.0 | 17.9 | 18.5 | 19.7 | 20.5 | 20.9 | 20.9 | 19.2 | 20.0 | 19.1 |
| 100 | | | 16.9 | 17.9 | 17.4 | 18.1 | 18.8 | 19.7 | 18.0 | 18.7 | 18.6 | 17.8 | 17.4 |
| 101 | | | 18.8 | 20.2 | 19.9 | 21.5 | 21.9 | 22.0 | 19.6 | 19.5 | 19.7 | 18.9 | 17.6 |
| 102 | | | 17.3 | 19.6 | 18.8 | 19.8 | 20.3 | 19.9 | 19.3 | 20.2 | 18.9 | 19.7 | 17.6 |
| 103 | | | 16.2 | 17.5 | 16.9 | 17.9 | 18.0 | 18.6 | 16.5 | 17.9 | 17.0 | 16.8 | 16.2 |
| 104 | | | 16.6 | 18.7 | 18.8 | 19.2 | 19.2 | 19.8 | 18.2 | 19.1 | 17.4 | 17.8 | 17.3 |
| Mean | | | 17.0 | 18.3 | 18.2 | 19.1 | 19.5 | 20.3 | 18.7 | 19.2 | 18.7 | 18.5 | 17.6 |
| SD | | | 1.01 | 0.98 | 0.90 | 0.94 | 1.08 | 0.82 | 1.00 | 0.90 | 0.91 | 1.07 | 0.94 |
| N | | | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |

| Females | Food consumption during premating, mating and postmating periods - individual values (grams/animal/day) | Appendix 11 |
|---|---|---|

| Cage Number | Phase / Week | PMT 1-2 | 2-3 | 3-4 |
|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | |
| 14 | | | | |
| 15 | | | | |
| 16 | | | | |
| 17 | | | | |
| 18 | | | | |
| 19 | | | | |
| 20 | | | | |
| 21 | | | | |
| 22 | | | | |
| 23 | | | | |
| 24 | | | | |
| 25 | | | | |
| 26 | | | | |
| Mean | | | | |
| SD | | | | |
| N | | | | |

| Females | Food consumption during premating, mating and postmating periods - individual values (grams/animal/day) | Appendix 11 |
|---|---|---|

| Cage Number | Phase / Week | PMT 1-2 | 2-3 | 3-4 |
|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | |
| 40 | | | | |
| 41 | | | | |
| 42 | | | | |
| 43 | | | | |
| 44 | | | | |
| 45 | | | | |
| 46 | | | | |
| 47 | | | | |
| 48 | | | | |
| 49 | | | | |
| 50 | | | | |
| 51 | | | | |
| 52 | | | | |
| Mean | | | | |
| SD | | | | |
| N | | | | |

| Females | Food consumption during premating, mating and postmating periods - individual values (grams/animal/day) | Appendix 11 |
|---|---|---|

| Cage Number | Phase Week | PMT 1-2 | 2-3 | 3-4 |
|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | |
| 66 | | | | |
| 67 | | | | |
| 68 | | | | |
| 69 | | | | |
| 70 | | | | |
| 71 | | | | |
| 72 | | | | |
| 73 | | | | |
| 56 | | 15.9 | 18.4 | 19.1 |
| 75 | | | | |
| 76 | | | | |
| 77 | | | | |
| 78 | | | | |
| Mean | | 15.9 | 18.4 | 19.1 |
| SD | | | | |
| N | | 1 | 1 | 1 |

| Females | Food consumption during premating, mating and postmating periods - individual values (grams/animal/day) | Appendix 11 |
|---|---|---|

| Cage Number | Phase Week | PMT 1-2 | 2-3 | 3-4 |
|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | |
| 92 | | | | |
| 93 | | | | |
| 94 | | | | |
| 95 | | | | |
| 96 | | | | |
| 97 | | | | |
| 98 | | | | |
| 99 | | | | |
| 100 | | | | |
| 101 | | | | |
| 102 | | | | |
| 103 | | | | |
| 104 | | | | |
| Mean | | | | |
| SD | | | | |
| N | | | | |

| Females | Food consumption during gestation - individual values (grams/animal/day) | Appendix 12 |
|---|---|---|

| Animal Number | Phase Day | GES 0-4 | 4-7 | 7-14 | 14-21 |
|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | |
| 1501 | | 21.8 | 20.9 | 23.6 | 17.5 |
| 1502 | | 18.2 | 19.7 | 23.6 | 21.9 |
| 1503 | | 17.8 | 20.9 | 24.6 | 22.3 |
| 1504 ts,np | | | | | 19.0x |
| 1505 | | 23.4 | 21.6 | 24.2 | 22.8 |
| 1506 | | 19.6 | 21.2 | 20.9 | 22.3 |
| 1507 | | 25.7 | 27.7 | 28.8 | 24.1 |
| 1508 | | 22.0 | 22.6 | 23.8 | 22.4 |
| 1509 tll | | 18.5 | 21.5 | 23.4 | 18.5 |
| 1510 | | 22.8 | 24.0 | 25.9 | 24.1 |
| 1511 | | 20.5 | 21.7 | 24.9 | 22.9 |
| 1512 ts,np | | 18.1x | 17.5x | 18.8x | 19.1x |
| 1513 tll | | 21.9 | 23.8 | 24.1 | 21.7 |
| 1514 | | 22.9 | 22.8 | 24.7 | 23.1 |
| 1515 | | 21.4 | 19.3 | 21.9 | 21.0 |
| 1516 | | 21.0 | 25.7 | 24.3 | 26.5 |
| 1517 | | 21.3 | 24.7 | 25.9 | 19.2 |
| 1518 | | 26.1 | 28.1 | 29.4 | 23.0 |
| 1519 | | 21.0 | 20.2 | 22.1 | 17.0 |
| 1520 | | 19.6 | 19.8 | 23.2 | 20.0 |
| 1521 ts,np | | 21.2x | 19.9x | 19.9x | 17.6x |
| 1522 tll | | 20.6 | 20.2 | 22.9 | 19.1 |
| 1523 | | 19.7 | 20.4 | 21.9 | 21.4 |
| 1524 ts,np | | 18.1x | 18.4x | 20.9x | 15.7x |
| 1525 | | 19.9 | 26.0 | 28.2 | 23.9 |

ts = terminal sacrifice, tll = total litter loss, np = not pregnant, x = excluded from calculation

| Females | Food consumption during gestation - individual values (grams/animal/day) | Appendix 12 |
|---|---|---|

| Animal Number | Phase Day | GES 0-4 | 4-7 | 7-14 | 14-21 |
|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | |
| 1526 | | 22.4 | 21.7 | 24.6 | 21.1 |
| Mean | | 21.3 | 22.5 | 24.4 | 21.6 |
| SD | | 2.13 | 2.58 | 2.18 | 2.32 |
| N | | 22 | 22 | 22 | 22 |

| Females | Food consumption during gestation - individual values (grams/animal/day) | Appendix 12 |
|---|---|---|

| Animal Number | Phase Day | GES 0-4 | 4-7 | 7-14 | 14-21 |
|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | |
| 2501 | | 23.1 | 25.2 | 25.6 | 21.5 |
| 2502 | | 18.1 | 19.4 | 21.0 | 21.0 |
| 2503 | | 18.0 | 19.6 | 22.8 | 23.1 |
| 2504 | | 25.3 | 29.5 | 29.7 | 22.7 |
| 2505 ts,np | | 20.0x | 22.5x | 20.9x | 17.8x |
| 2506 tll | | 20.9 | 19.6 | 23.2 | 20.6 |
| 2507 | | 20.3 | 23.2 | 23.4 | 19.7 |
| 2508 ts,np | | 17.3x | 17.4x | 18.2x | 19.0x |
| 2509 | | 23.5 | 25.1 | 26.3 | 23.5 |
| 2510 | | 19.6 | 21.2 | 21.6 | 22.7 |
| 2511 ts,np | | 21.5x | 24.1x | 25.9x | 26.0x |
| 2512 | | 20.6 | 19.4 | 24.5 | 24.5 |
| 2513 | | 17.0 | 17.2 | 22.5 | 23.0 |
| 2514 | | 19.9 | 21.3 | 22.7 | 24.2 |
| 2515 | | 17.6 | 23.4 | 23.7 | 20.7 |
| 2516 tll | | 23.3 | 24.8 | 24.0 | 19.9 |
| 2517 | | 18.8 | 18.6 | 21.7 | 21.4 |
| 2518 | | 19.2 | 20.9 | 20.1 | 18.0 |
| 2519 | | 19.9 | 20.2 | 22.0 | 19.8 |
| 2520 | | 21.8 | 22.6 | 24.6 | 21.9 |
| 2521 | | 21.9 | 22.0 | 25.9 | 25.3 |
| 2522 | | 23.2 | 24.1 | 25.7 | 22.8 |
| 2523 | | 17.6 | 16.7 | 18.6 | 21.2 |
| 2524 | | | | | 18.8 |
| 2525 ts,np | | 17.1x | 17.5x | 18.5x | 17.5x |

ts = terminal sacrifice, tll = total litter loss, np = not pregnant, x = excluded from calculation

| Females | Food consumption during gestation - individual values (grams/animal/day) | Appendix 12 |
|---|---|---|

| Animal Number | Phase Day | GES 0-4 | 4-7 | 7-14 | 14-21 |
|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | |
| 2526 tll | | 22.7 | 22.9 | 23.3 | 22.2 |
| Mean | | 20.6 | 21.8 | 23.5 | 21.7 |
| SD | | 2.34 | 3.04 | 2.41 | 1.87 |
| N | | 21 | 21 | 21 | 22 |

tll = total litter loss,

| Females | Food consumption during gestation - individual values (grams/animal/day) | Appendix 12 |
|---|---|---|

| Animal Number | Phase Day | GES 0-4 | 4-7 | 7-14 | 14-21 |
|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | |
| 3501 | | 23.5 | 25.4 | 28.5 | 24.4 |
| 3502 ts,np | | 19.0x | 19.2x | 19.1x | 18.2x |
| 3503 | | 20.7 | 22.4 | 22.7 | 21.5 |
| 3504 tll | | 18.2 | 20.2 | 22.3 | 17.0 |
| 3505 | | 24.2 | 26.8 | 24.9 | 22.5 |
| 3506 | | 23.7 | 23.8 | 24.5 | 25.0 |
| 3507 | | 20.4 | 20.5 | 20.8 | 17.8 |
| 3508 | | 16.3 | 16.7 | 18.6 | 19.5 |
| 3509 | | 25.9 | 24.6 | 28.9 | 26.3 |
| 3510 | | 23.8 | 25.3 | 26.6 | 27.0 |
| 3511 | | 20.4 | 22.9 | 25.1 | 28.3 |
| 3512 | | 24.4 | 31.2 | 32.9 | 29.8 |
| 3513 | | 24.6 | 27.0 | 28.0 | 23.6 |
| 3514 | | 20.3 | 23.7 | 24.8 | 25.3 |
| 3516 | | 22.5 | 22.8 | 24.2 | 22.4 |
| 3518 | | 23.6 | 24.1 | 25.2 | 27.2 |
| 3519 ts,np | | 19.0x | 18.0x | 20.5x | 20.4x |
| 3520 | | 27.7 | 28.8 | 27.3 | 24.0 |
| 3521 tll | | 20.9 | 19.7 | 19.5 | 18.4 |
| 3522 | | 28.0 | 27.2 | 26.7 | 23.5 |
| 3523 | | 20.1 | 21.4 | 23.1 | 21.8 |
| 3524 ts,np | | | 18.6x | 19.6x | 19.0x |
| 3525 | | 17.7 | 18.7 | 20.0 | 20.8 |
| 3526 | | 23.1 | 23.8 | 25.3 | 26.0 |

ts = terminal sacrifice, tll = total litter loss, np = not pregnant, x = excluded from calculation

| Females | Food consumption during gestation - individual values (grams/animal/day) | Appendix 12 |
|---|---|---|

| Animal Number | Phase Day | GES 0-4 | 4-7 | 7-14 | 14-21 |
|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | |
| Mean | | 22.4 | 23.7 | 24.7 | 23.4 |
| SD | | 3.09 | 3.48 | 3.46 | 3.49 |
| N | | 21 | 21 | 21 | 21 |

| Females | Food consumption during gestation - individual values (grams/animal/day) | Appendix 12 |
|---|---|---|

| Animal Number | Phase Day | GES 0-4 | 4-7 | 7-14 | 14-21 |
|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | |
| 4501 | | 22.6 | 21.5 | 23.6 | 19.7 |
| 4502 | | 19.9 | 23.7 | 22.5 | 24.2 |
| 4503 | | 18.5 | 19.9 | 21.0 | 20.9 |
| 4504 | | 17.6 | 19.2 | 21.7 | 22.7 |
| 4505 | | 25.1 | 27.8 | 25.1 | 23.6 |
| 4506 ts,np | | 22.3x | 16.9x | 18.8x | 17.9x |
| 4507 u1 | | 22.5 | 23.1 | 24.0 | 19.7 |
| 4508 ts,np | | 24.0x | 23.5x | 23.9x | 25.3x |
| 4509 | | 22.5 | 24.0 | 25.3 | 22.5 |
| 4510 | | 23.2 | 26.3 | 25.9 | 25.7 |
| 4511 ts,np | | 20.4x | 20.3x | 21.2x | 23.4x |
| 4512 | | 19.8 | 19.6 | 19.7 | 21.7 |
| 4513 | | 22.7 | 24.1 | 24.6 | 19.8 |
| 4514 ts,np | | 21.6x | 20.9x | 19.9x | 19.9x |
| 4515 | | 23.1 | 26.4 | 27.6 | 25.7 |
| 4516 | | 21.8 | 23.3 | 23.8 | 20.9 |
| 4517 | | 22.6 | 21.0 | 22.6 | 21.8 |
| 4518 | | 22.8 | 23.0 | 24.1 | 24.6 |
| 4519 ts,np | | 20.7x | 22.3x | 22.6x | 19.8x |
| 4520 ts,np | | 19.7x | 19.3x | 19.6x | 19.6x |
| 4521 | | 18.7 | 19.8 | 21.9 | 21.0 |
| 4522 | | 21.8 | 25.7 | 21.8 | 23.8 |
| 4523 | | 19.0 | 22.2 | 20.1 | 19.5 |
| 4524 | | 21.1 | 21.1 | 22.3 | 23.4 |
| 4525 | | 24.3 | 24.0 | 24.7 | 18.7 |

ts = terminal sacrifice, u1 = found dead, np = not pregnant, x = excluded from calculation

| Females | Food consumption during gestation - individual values (grams/animal/day) | Appendix 12 |
|---|---|---|

| Animal Number | Phase Day | GES 0-4 | 4-7 | 7-14 | 14-21 |
|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | |
| 4526 | | 22.0 | 24.3 | 23.6 | 22.6 |
| Mean | | 21.6 | 23.0 | 23.3 | 22.1 |
| SD | | 2.01 | 2.45 | 1.98 | 2.09 |
| N | | 20 | 20 | 20 | 20 |

| Females | Food consumption during lactation - individual values (grams/animal/day) | Appendix 13 |
|---|---|---|

| Animal Number | Phase Day | . | LAC 1-4 | 4-7 | 7-14 | 14-21 |
|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | |
| 1501 ts | | | 27.0 | 41.0 | 47.4 | 58.0 |
| 1502 ts | | | 27.0 | 21.6 | 38.5 | 54.6 |
| 1503 ts | | | 19.8 | 30.9 | 47.3 | 55.9 |
| 1505 ts | | | 29.5 | 30.8 | 42.8 | 58.8 |
| 1506 ts | | | 24.8 | 40.3 | 47.7 | 55.4 |
| 1507 ts | | | 10.8 | 25.7 | 46.2 | 58.3 |
| 1508 ts | | | 35.1 | 41.5 | 49.7 | 60.7 |
| 1510 ts | | | 24.8 | 28.0 | 43.1 | 52.7 |
| 1511 ts | | | 20.6 | 32.5 | 39.0 | 54.7 |
| 1514 ts | | | 39.5 | 41.7 | 51.5 | 71.2 |
| 1515 ts | | | 30.3 | 26.6 | 41.2 | 57.8 |
| 1516 ts | | | 14.5 | 22.3 | 26.9 | 29.7 |
| 1517 ts | | | 22.7 | 30.8 | 48.3 | 59.5 |
| 1518 ts | | | 32.2 | 30.1 | 47.9 | 68.3 |
| 1519 ts | | | 27.7 | 33.8 | 38.8 | 49.9 |
| 1520 ts | | | 25.4 | 33.8 | 47.4 | 55.7 |
| 1522 tll | | | 27.7 | 27.8 | 31.8 | |
| 1523 ts | | | 32.6 | 38.1 | 45.8 | 58.4 |
| 1525 ts | | | 31.4 | 36.4 | 45.3 | 64.6 |
| 1526 ts | | | 22.2 | 31.8 | 41.2 | 53.5 |
| Mean | | | 26.3 | 32.3 | 43.4 | 56.7 |
| SD | | | 6.77 | 6.10 | 6.13 | 8.35 |
| N | | | 20 | 20 | 20 | 19 |

ts = terminal sacrifice, tll = total litter loss

| Females | Food consumption during lactation - individual values (grams/animal/day) | Appendix 13 |
|---|---|---|

| Animal Number | Phase Day | . | LAC 1-4 | 4-7 | 7-14 | 14-21 |
|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | |
| 2501 ts | | | 24.1 | 29.8 | 48.7 | 54.7 |
| 2502 ts | | | 26.4 | 41.9 | 52.5 | 64.0 |
| 2503 ts | | | 24.6 | 24.6 | 40.8 | 54.6 |
| 2504 ts | | | 18.5 | 37.2 | 72.5 | 69.9 |
| 2507 ts | | | 32.5 | 35.1 | 51.0 | 58.5 |
| 2509 ts | | | 23.9 | 37.8 | 47.9 | 54.9 |
| 2510 ts | | | 33.3 | 38.5 | 47.2 | 59.6 |
| 2512 ts | | | 24.7 | 28.9 | 42.7 | 54.2 |
| 2513 ts | | | 29.4 | 32.0 | 45.6 | 50.1 |
| 2514 ts | | | 26.8 | 32.2 | 45.2 | 49.7 |
| 2515 ts | | | 22.7 | 40.1 | 50.0 | 59.4 |
| 2517 ts | | | 23.2 | 31.6 | 48.5 | 55.8 |
| 2518 ts | | | 20.7 | 30.2 | 45.5 | 62.2 |
| 2519 ts | | | 20.3 | 25.0 | 45.3 | 59.1 |
| 2520 ts | | | 18.9 | 28.9 | 41.8 | 54.4 |
| 2521 ts | | | 32.3 | 42.1 | 46.1 | 62.5 |
| 2522 ts | | | 25.3 | 29.5 | 49.8 | 65.4 |
| 2523 ts | | | 28.5 | 39.4 | 41.9 | 56.8 |
| 2524 ts | | | 31.0 | 38.9 | 54.8 | 66.2 |
| Mean | | | 25.6 | 33.9 | 48.3 | 58.5 |
| SD | | | 4.56 | 5.53 | 6.94 | 5.46 |
| N | | | 19 | 19 | 19 | 19 |

ts = terminal sacrifice

| Females | Food consumption during lactation - individual values (grams/animal/day) | Appendix 13 |
|---|---|---|

| Animal Number | Phase Day | . | LAC 1-4 | 4-7 | 7-14 | 14-21 |
|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | |
| 3501 ts | | | 19.4 | 32.6 | nw | 63.8 |
| 3503 ts | | | 13.8 | 26.4 | 37.5 | 54.1 |
| 3505 ts | | | 31.5 | 31.7 | 46.9 | 57.1 |
| 3506 ts | | | 28.3 | 36.2 | 51.1 | 60.4 |
| 3507 ts | | | 19.0 | 25.3 | 29.7 | 32.9 |
| 3508 ts | | | 17.8 | 34.0 | 45.0 | 61.2 |
| 3509 ts | | | 22.0 | 32.4 | 47.5 | 65.3 |
| 3510 ts | | | 27.5 | 31.3 | 43.1 | 54.2 |
| 3511 ts | | | 22.2 | 21.2 | 30.7 | 44.1 |
| 3512 ts | | | 47.4 | 29.1 | 51.7 | 62.2 |
| 3513 ts | | | 27.4 | 28.9 | 49.8 | 62.8 |
| 3514 ts | | | 30.3 | 35.4 | 45.7 | 58.7 |
| 3515 ts | | | 26.2 | 27.1 | 37.7 | 49.9 |
| 3516 ts | | | 32.8 | 37.9 | 52.7 | 67.1 |
| 3518 ts | | | 10.7 | 20.8 | 23.8 | 22.9 |
| 3520 ts | | | 30.3 | 34.5 | 47.7 | 58.7 |
| 3522 ts | | | 32.9 | 33.6 | 54.9 | 62.0 |
| 3523 ts | | | 24.0 | 34.7 | 46.7 | 64.2 |
| 3525 ts | | | 26.8 | 35.5 | 46.1 | 57.9 |
| 3526 ts | | | 28.8 | 28.2 | 44.5 | 55.8 |
| Mean | | | 25.9 | 30.8 | 43.8 | 55.8 |
| SD | | | 8.00 | 4.85 | 8.38 | 11.09 |
| N | | | 20 | 20 | 19 | 20 |

ts = terminal sacrifice, nw = not weighed

| Females | Food consumption during lactation - individual values (grams/animal/day) | Appendix 13 |
|---|---|---|

| Animal Number | Phase Day | . | LAC 1-4 | 4-7 | 7-14 | 14-21 |
|---|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | | |
| 4501 ts | | | 26.8 | 35.7 | 48.4 | 63.6 |
| 4502 ts | | | 30.4 | 30.8 | 47.3 | 58.1 |
| 4503 ts | | | 18.8 | 32.4 | 41.1 | 51.0 |
| 4504 ts | | | 30.2 | 36.4 | 46.5 | 61.7 |
| 4505 ts | | | 35.4 | 38.4 | 54.9 | 71.0 |
| 4509 ts | | | 27.8 | 33.6 | 45.6 | 66.0 |
| 4510 ts | | | 27.8 | 41.4 | 51.8 | 65.2 |
| 4512 ts | | | 28.2 | 32.2 | 46.0 | 57.9 |
| 4513 ts | | | 24.4 | 31.4 | 44.5 | 56.1 |
| 4515 ts | | | 32.5 | 40.9 | 47.2 | 60.3 |
| 4516 ts | | | 32.9 | 46.4 | 54.0 | 65.5 |
| 4517 ts | | | 26.4 | 30.1 | 47.3 | 58.7 |
| 4518 ts | | | 24.6 | 40.9 | 54.8 | 72.9 |
| 4521 ts | | | 21.7 | 34.7 | 47.2 | 60.6 |
| 4522 ts | | | 27.8 | 32.7 | 49.4 | 57.4 |
| 4523 ts | | | 24.9 | 37.2 | 44.2 | 54.0 |
| 4524 ts | | | 26.9 | 34.4 | 48.0 | 58.1 |
| 4525 ts | | | 25.5 | 35.4 | 37.8 | 56.8 |
| 4526 ts | | | 18.7 | 30.1 | 41.6 | 50.3 |
| Mean | | | 26.9 | 35.5 | 47.2 | 60.3 |
| SD | | | 4.37 | 4.45 | 4.53 | 6.01 |
| N | | | 19 | 19 | 19 | 19 |

ts = terminal sacrifice

| Females | Estrous cycle and mating data - individual observations | Appendix 14 |
|---|---|---|

| Animal Number | Phase Day | PRC 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | COH 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1501 | | D | E | M | D | E | D | D | D | E | E | M | D | D | E | M | D | D | S | | | | | | | | |
| 1502 | | D | D | E | M | D | D | E | M | M-D | D | E | D | D | E | E | S | | | | | | | | | | |
| 1503 | | D | D | E | M | D | D | E | D | D | D | E | D | D | D | D | S | | | | | | | | | | |
| 1504 | | D | P | E | M | D | D | P | E | M | D | D | P-E | E | M-D | D | D | D | E | M | D | D | D | D | D | D | D |
| 1505 | | D | D | P | E | E | E | M | D | P | E | M | D | D | D | D-P | S | | | | | | | | | | |
| 1506 | | D | E | E | D | P | E | M | D | P | E | M-D | D | D | E | M | D | D | S | | | | | | | | |
| 1507 | | E | D | D | M | D | D | E | M | D | D | E | D | D | D | E | M | D | D | S | | | | | | | |
| 1508 | | E | M | D | E | E | M | D | P | E | M | D | D | E | M | D | D | S | | | | | | | | | |
| 1509 | | M | D | E | E | M | D | D | E | M | D | D-P | E | D | D | D | S | | | | | | | | | | |
| 1510 | | M | D | E | E | M | D | D-P | E | E | D | D-P | E | D | D | D | P | S | | | | | | | | | |
| 1511 | | D | D | E | M | D | D | E | M | D | D | E | M | D | D | E | M | D | D | S | | | | | | | |
| 1512 | | D | E | M | D | D | D-P | E | M-D | D | E | M-D | D | D | D | E | M | D | S | | | | | | | | |
| 1513 | | D | D | P | E | D | D | D-P | E | M | D | D | E | M | D | D | S | | | | | | | | | | |
| 1514 | | D | E | E | M | D | E | M | D | D | D | M | D | D | E | M | D | D | S | | | | | | | | |
| 1515 | | D | E | M | D | D | E | M | D | D | D | M | D | D | D | D-P | D | D | S | | | | | | | | |
| 1516 | | D | D | D | D | P | E | M | D | P | P | E | E | D | D | D | D-P | S | | | | | | | | | |
| 1517 | | D | E | E | M | D | D | D-P | E | M | D | D | E | D | D | D | S | | | | | | | | | | |
| 1518 | | E | M | D | D | E | M-D | D | D | E | M | D | D | E | M | D | D | S | | | | | | | | | |
| 1519 | | D | D | E | M | D | D | E | E | D | D | D | D | E | M | M-D | D | S | | | | | | | | | |
| 1520 | | D | E | M | D | D | E | M | D | P | E | M | D | D | E | E | D | D | S | | | | | | | | |
| 1521 | | E | D | E | E | E | M | D | P | E | M | D | D | E | M | D | D | S | | | | | | | | | |
| 1522 | | D | E | M | D | D | E | M | D | D | E | M | D | D | E | D | D | D | S | | | | | | | | |
| 1523 | | M | D | D | E | E | D | D | D | D | M | D | E | D | D | D | S | | | | | | | | | | |
| 1524 | | D | D | E | M | D | D | D | E | E | M | D | D | D-P | E | M | S | | | | | | | | | | |
| 1525 | | D | D | E | M | D | D | E | M | D | D | E | M | D | D | E | D | D | P-E | C | | | | | | | |
| 1526 | | D | E | M | D | D | E | M | D | D | E | M | D | D | E | M | D | D | S | | | | | | | | |

D = diestrus, E = estrus, M = metestrus, P = proestrus, C = copulatory plug, S = sperm

| Females | Estrous cycle and mating data - individual observations | Appendix 14 |
|---|---|---|

| Animal Number | Phase Day | PRC 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | COH 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2501 | | D | E | M | D | D | E | M | D | D | E | E | E | E | D | D | S | | | | | | | | | | |
| 2502 | | D | D | E | M-D | D | D | E | M | D | - | E | D | D | D | E | M | D | D | S | | | | | | | |
| 2503 | | M | D | D | E | M | D | D-P | E | M | M | D | E | M-D | D | D | S | | | | | | | | | | |
| 2504 | | D | E | E | D | P | E | M | D | P | E | M | D | D | E | E | M | D | E | E | C | | | | | | |
| 2505 | | M | D | D | E | M | D | D | E | M | D | D | E | M | D | D | S | | | | | | | | | | |
| 2506 | | E | D | D | D | E | M | D | D | D | M | D | D | E | D | D | D | S | | | | | | | | | |
| 2507 | | D | D | E | M | D | D | E | M | D | E | D | D | D | P-E | E | M | D | P-E | S | | | | | | | |
| 2508 | | D | D | E | E | M-D | D | D | E | M | D | D | E | E | E | D | D | D | S | | | | | | | | |
| 2509 | | D | E | M | D | P | E | M-D | D | D | E | M | D | D | E | M | D | D | S | | | | | | | | |
| 2510 | | D | D | E | M | D | D | D | P | D | E | M | D | D | P-E | E | M | D | D | C | | | | | | | |
| 2511 | | D | D | D | E | E | M | D | D | P | E | M | D | E | E | M | S | | | | | | | | | | |
| 2512 | | D | D | D | E | E | D | D | E | M | D | D | E | M-D | D | D | S | | | | | | | | | | |
| 2513 | | D | D | D | M | D | D | E | M | D | E | E | D | D | D | E | M | D | P | S | | | | | | | |
| 2514 | | D | E | E | M | D | D | E | M | D | P | E | M | D | D-P | E | M | D | D | S | | | | | | | |
| 2515 | | M-D | D | E | E | M | D | D | E | M | D | D | E | M | D | D | S | | | | | | | | | | |
| 2516 | | D | D | D | D | D | D | D | D | D | - | D | D | D | D | P-E | M | D | D | S | | | | | | | |
| 2517 | | D | D | P | D | E | E | M | D | P | E | M | D | D | E | M | D | D | S | | | | | | | | |
| 2518 | | E | D | D | D | E | M | D | D | E | E | E | D | E | D | D | P | S | | | | | | | | | |
| 2519 | | D | E | E | M | D | D | E | E | M-D | D | E | D | P | M | D | P | S | | | | | | | | | |
| 2520 | | E | M | D | D | P | E | M | D | P | E | M | E | D | D | D | S | | | | | | | | | | |
| 2521 | | E | D | D | D | E | D | D | D-P | E | M-D | D | D | E | M-D | D | P | S | | | | | | | | | |
| 2522 | | D | D | E | M | D | D | E | M | D | P | E | M-D | D | D | E | M | D | D-P | S | | | | | | | |
| 2523 | | D | D | E | M | D | D | D | D | D | M | E | D | D | D | D | D | S | | | | | | | | | |
| 2524 | | M | D | P | E | M | D | D-P | E | M | D | D-P | E | M | D | D | D | - | D | D | D | D | D | D | D | D | D |
| 2525 | | D | D-P | E | M | D | D | E | E | D | E | E | M | D | D | E | - | | | | | | | | | | |
| 2526 | | D | D | E | M | D | D | E | D | D | P | E | M-D | D | P | E | M | D | P-E | S | | | | | | | |

- = stage not determined, D = diestrus, E = estrus, M = metestrus, P = proestrus, C = copulatory plug, S = sperm

| Females | Estrous cycle and mating data - individual observations | Appendix 14 |
|---|---|---|

| Animal Number | Phase | PRC | | | | | | | | | | | | | | | COH | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Day | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3501 | | E | M | D | D | E | M | D | D | E | M | D | D | E | D | D-P | P | S | | | | | | | | | | |
| 3502 | | D-P | E | M | D | P | E | M-D | D | P | E | M | D | D | E | D | D | D | S | | | | | | | | | | |
| 3503 | | D | D | E | M | D | D | E | M | D | P-E | E | D | D | D | E | M | D | D | S | | | | | | | | | |
| 3504 | | E | D | D | D | E | D | D | P | P | P | E | D | D | D | E | S | | | | | | | | | | | | |
| 3505 | | D | D | E | E | M | D | D | P | E | E | M | D | M | D | D | P | S | | | | | | | | | | | |
| 3506 | | D | D | E | M | D | P | E | M | D | D | E | M | D | D | E | M | D | D | S | | | | | | | | | |
| 3507 | | E | M | D | D | E | M | D | D | D | D | M | D | E | M-D | D | P | S | | | | | | | | | | | |
| 3508 | | D | D | D | E | M | D | D | E | M | D | D | E | M | D | D | S | | | | | | | | | | | | |
| 3509 | | D | D | D | D | P | E | D | D | P | E | M | D | D | E | E | D | D | S | | | | | | | | | | |
| 3510 | | D | D | E | M | D | E | M | D | P | P | D | D | E | E | M-D | S | | | | | | | | | | | | |
| 3511 | | D | E | M | D | E | E | M | D | P | E | M | D | D | E | D | D | D | S | | | | | | | | | | |
| 3512 | | D | D | E | M | D | D | E | M | D | P | E | D | D | D | E | S | | | | | | | | | | | | |
| 3513 | | D | D | D | D | D | D | D-P | E | M | D | D | D | D | D | D | P | M | D | D | S | | | | | | | | |
| 3514 | | D | D | D | E | M | D | D | E | E | M | D | D | D-P | P | E | S | | | | | | | | | | | | |
| 3515 | | D | D | E | M-D | D | D | E | D | P | P | E | M | D | D | E | M | D | E | E | M | M-D | P | D | D | D | D | | |
| 3516 | | D | D | E | M | D | D | D | P | P | E | E | D | D | D | E | M | D | P | S | | | | | | | | | |
| 3517 | | D | D | D | D | D | D | D | D-P | E | M | D | E | D | D | E | M | D | E | E | E | D | D | E | E | D | D | | |
| 3518 | | D | D | E | M | D | D | E | M | D | D | E | D | D | D | E | M | D | D | S | | | | | | | | | |
| 3519 | | D | D | P | M-D | D | D | D | D | D | D | D | D | E | D | D | P | S | | | | | | | | | | | |
| 3520 | | D | E | M | D | D | E | D | D | P | E | D | D | D | E | M | D | D | S | | | | | | | | | | |
| 3521 | | D | D | E | D | D | E | M-D | D | E | E | M | D | D | E | M | D | D | S | | | | | | | | | | |
| 3522 | | D | E | M | D | D | E | M-D | D | P | E | M | D | D | E | M-D | D | D | E | M | D | D | S | | | | | | |
| 3523 | | M-D | D | E | E | M-D | D | D | E | M | D | E | M | D | D | D | S | | | | | | | | | | | | |
| 3524 | | D | D | E | M-D | D | P | E | M | D | P | E | D | D | D | E | D | D | D | | | | | | | | | | |
| 3525 | | D | D | E | D | D | D | E | M | D | P | E | M | D | D | E | M | D | D | S | | | | | | | | | |
| 3526 | | M | D | D | E | M | D | D | E | M | D | D | E | M | D | D | S | | | | | | | | | | | | |

D = diestrus, E = estrus, M = metestrus, P = proestrus, C = copulatory plug, S = sperm

| Females | Estrous cycle and mating data - individual observations | Appendix 14 |
|---|---|---|

| Animal Number | Phase Day | PRC 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | COH 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4501 | | D | E | D | D | D | E | M | D | P | E | M | D | D | E | D | D | D | S | | | | | | | | |
| 4502 | | D | D-P | E | M-D | D | D | E | M | D | D-P | E | D | D | D | E | M | M-D | D | S | | | | | | | |
| 4503 | | D | D | E | M | D | E | E | M | M-D | D | E | D | D | D | E | M | D | D | S | | | | | | | |
| 4504 | | E | M | D | D-P | E | M | D | E | E | M | D | D | E | M | D | P | S | | | | | | | | | |
| 4505 | | D | D | E | M | D | D | E | M | D | P-E | E | D | D | D | E | M | D | D | S | | | | | | | |
| 4506 | | E | E | D | E | E | E | E | E | E | E | E | E | E | E | E | E | S | | | | | | | | | |
| 4507 | | D | D | E | M | D | D | E | M | D | D | E | M | D | D | E | M | D | D | S | | | | | | | |
| 4508 | | E | E | E | M | D | E | M | M | D | P-E | E | E | E | E | E | S | | | | | | | | | | |
| 4509 | | D | E | E | D | D-P | E | M-D | D | P | P | E | D | D | E | M | D | D | S | | | | | | | | |
| 4510 | | D | E | M | D | D | E | M | D | P | E | M-D | D | D | D | D-P | S | | | | | | | | | | |
| 4511 | | D | E | M | D | D | D | D | D | D | E | M-D | D | D | E | M-D | S | | | | | | | | | | |
| 4512 | | D | D | D | D | D | D | E | M | D | D | E | D | D | D | E | M | D | D | S | | | | | | | |
| 4513 | | D | E | D | D | D | E | M | D | P | E | M | D | D | E | D | D | D | S | | | | | | | | |
| 4514 | | E | E | D | D | P | E | M | D | P | - | M | D | D | E | D | S | | | | | | | | | | |
| 4515 | | E | M | D | D | D | D-P | M | D | D | E | E | M | D | D | D | S | | | | | | | | | | |
| 4516 | | D | D | P | E | M | D | D-P | E | M-D | D | D | E | M | D | D | S | | | | | | | | | | |
| 4517 | | D-P | E | M | D | P | E | M-D | D | P | E | M | D | D | E | D | D | D | S | | | | | | | | |
| 4518 | | D | D | E | E | E | D | D | D-P | P | D | D | D | D | D | D | S | | | | | | | | | | |
| 4519 | | D | E | E | M | D | E | M | D | P | E | M | D | D | E | M | D | D | S | | | | | | | | |
| 4520 | | D | D | E | M | D | D | E | M-D | D | D | E | D | D | D | E | D | D | S | | | | | | | | |
| 4521 | | D | E | E | D | D | E | M | D | P | E | M | D | D | E | M | D | D | S | | | | | | | | |
| 4522 | | D | D | D | D | D | D | E | M | D | P | E | D | D | D | E | M | D | D | S | | | | | | | |
| 4523 | | D | D | E | M-D | D | D | E | D | P | P | E | D | D | D | E | M | D | P-E | S | | | | | | | |
| 4524 | | D | E | M-D | D | D | E | M | D | D | E | M | D | D | E | M | D | D | S | | | | | | | | |
| 4525 | | D | D | D | D | D | D | M | D | D | P | E | D | D | D | P | S | | | | | | | | | | |
| 4526 | | D | D | D | D | D | D | E | D | D | D | D | D | D | D | E | M | D | D | S | | | | | | | |

- = stage not determined, D = diestrus, E = estrus, M = metestrus, P = proestrus, C = copulatory plug, S = sperm

| Females | Estrous cycle and mating data - individual observations | Appendix 14 |
|---|---|---|

| Animal Number | Phase Day | COH 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | Cycle length c1 | c2 | c3 | c4 | c5 | c6 | Mean length | Number of cycles | Status |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | |
| 1501 | | | | | | | | | | | | 3 | 5 | 4 | 4 | | | 4.0 | 4 | IR |
| 1502 | | | | | | | | | | | | 4 | 4 | 5 | | | | 4.3 | 3 | RC |
| 1503 | | | | | | | | | | | | 4 | 4 | 5 | | | | 4.3 | 3 | RC |
| 1504 | | D | D | D | D | D | | | | | | 5 | 5 | 5 | | | | 5.0 | 3 | RC |
| 1505 | | | | | | | | | | | | 5 | 6 | | | | | 5.5 | 2 | IR |
| 1506 | | | | | | | | | | | | 3 | 4 | 4 | 4 | | | 3.8 | 4 | IR |
| 1507 | | | | | | | | | | | | 6 | 4 | 4 | 4 | | | 4.5 | 4 | IR |
| 1508 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 1509 | | | | | | | | | | | | 4 | 4 | 4 | | | | 4.0 | 3 | RC |
| 1510 | | | | | | | | | | | | 5 | 3 | 5 | | | | 4.3 | 3 | IR |
| 1511 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 1512 | | | | | | | | | | | | 5 | 3 | 5 | 3 | | | 4.0 | 4 | IR |
| 1513 | | | | | | | | | | | | 4 | 4 | 4 | | | | 4.0 | 3 | RC |
| 1514 | | | | | | | | | | | | 3 | 8 | 4 | | | | 5.0 | 3 | IR |
| 1515 | | | | | | | | | | | | 3 | 12 | | | | | 7.5 | 2 | IR |
| 1516 | | | | | | | | | | | | 6 | 5 | | | | | 5.5 | 2 | IR |
| 1517 | | | | | | | | | | | | 5 | 4 | 4 | | | | 4.3 | 3 | RC |
| 1518 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 1519 | | | | | | | | | | | | 5 | 4 | 4 | | | | 4.3 | 3 | RC |
| 1520 | | | | | | | | | | | | 4 | 4 | 5 | 3 | | | 4.0 | 4 | IR |
| 1521 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 1522 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 1523 | | | | | | | | | | | | 7 | 4 | | | | | 5.5 | 2 | IR |
| 1524 | | | | | | | | | | | | 6 | 5 | 2 | | | | 4.3 | 3 | IR |
| 1525 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 1526 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |

D = diestrus, c1, c2…c6 = cycle number, IR = irregular cycling, RC = regular cycling

| Females | Estrous cycle and mating data - individual observations | Appendix 14 |
|---|---|---|

| Animal Number | Phase Day | COH 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | Cycle length c1 | c2 | c3 | c4 | c5 | c6 | Mean length | Number of cycles | Status |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | |
| 2501 | | | | | | | | | | | | 4 | 7 | 3 | | | | 4.7 | 3 | IR |
| 2502 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 2503 | | | | | | | | | | | | 4 | 4 | 4 | | | | 4.0 | 3 | RC |
| 2504 | | | | | | | | | | | | 3 | 4 | 5 | 5 | | | 4.3 | 4 | IR |
| 2505 | | | | | | | | | | | | 4 | 4 | 4 | | | | 4.0 | 3 | RC |
| 2506 | | | | | | | | | | | | 4 | 8 | 4 | | | | 5.3 | 3 | IR |
| 2507 | | | | | | | | | | | | 4 | 3 | 5 | 4 | | | 4.0 | 4 | IR |
| 2508 | | | | | | | | | | | | 4 | 6 | 4 | | | | 4.7 | 3 | IR |
| 2509 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 2510 | | | | | | | | | | | | 7 | 5 | 4 | | | | 5.3 | 3 | IR |
| 2511 | | | | | | | | | | | | 5 | 4 | 2 | | | | 3.7 | 3 | IR |
| 2512 | | | | | | | | | | | | 3 | 3 | 4 | | | | 3.3 | 3 | IR |
| 2513 | | | | | | | | | | | | 4 | 4 | 4 | | | | 4.0 | 3 | RC |
| 2514 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 2515 | | | | | | | | | | | | 4 | 4 | 4 | | | | 4.0 | 3 | RC |
| 2516 | | | | | | | | | | | | 5 | 4 | | | | | 4.5 | 2 | RC |
| 2517 | | | | | | | | | | | | 4 | 4 | 4 | | | | 4.0 | 3 | RC |
| 2518 | | | | | | | | | | | | 4 | 6 | 2 | 4 | | | 4.0 | 4 | IR |
| 2519 | | | | | | | | | | | | 5 | 3 | 6 | | | | 4.7 | 3 | IR |
| 2520 | | | | | | | | | | | | 5 | 4 | 2 | 4 | | | 3.8 | 4 | IR |
| 2521 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 2522 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 2523 | | | | | | | | | | | | 8 | 6 | | | | | 7.0 | 2 | IR |
| 2524 | | D | D | D | D | D | | | | | | 4 | 4 | 5 | | | | 4.3 | 3 | RC |
| 2525 | | | | | | | | | | | | 5 | 3 | 5 | | | | 4.3 | 3 | IR |
| 2526 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |

D = diestrus, c1, c2…c6 = cycle number, IR = irregular cycling, RC = regular cycling

| Females | Estrous cycle and mating data - individual observations | Appendix 14 |
|---|---|---|

| Animal Number | Phase Day | COH 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | Cycle length c1 | c2 | c3 | c4 | c5 | c6 | Mean length | Number of cycles | Status |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | |
| 3501 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 3502 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 3503 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 3504 | | | | | | | | | | | | 4 | 6 | 5 | | | | 5.0 | 3 | IR |
| 3505 | | | | | | | | | | | | 6 | 7 | | | | | 6.5 | 2 | IR |
| 3506 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 3507 | | | | | | | | | | | | 4 | 8 | 4 | | | | 5.3 | 3 | IR |
| 3508 | | | | | | | | | | | | 4 | 4 | 4 | | | | 4.0 | 3 | RC |
| 3509 | | | | | | | | | | | | 4 | 5 | 3 | | | | 4.0 | 3 | IR |
| 3510 | | | | | | | | | | | | 3 | 8 | 2 | | | | 4.3 | 3 | IR |
| 3511 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 3512 | | | | | | | | | | | | 4 | 4 | 5 | | | | 4.3 | 3 | RC |
| 3513 | | | | | | | | | | | | 8 | 4 | | | | | 6.0 | 2 | IR |
| 3514 | | | | | | | | | | | | 5 | 7 | | | | | 6.0 | 2 | IR |
| 3515 | | D | D | D | D | D | D | D | D | D | D | 4 | 4 | 4 | 4 | 4 | | 4.0 | 5 | RC |
| 3516 | | | | | | | | | | | | 8 | 4 | 4 | | | | 5.3 | 3 | IR |
| 3517 | | E | E | D | P-E | P-E | P-E | P-E | D | D | D | 3 | 3 | 5 | 4 | 4 | 5 | 4.0 | 6 | IR |
| 3518 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 3519 | | | | | | | | | | | | 10 | 4 | | | | | 7.0 | 2 | IR |
| 3520 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 3521 | | | | | | | | | | | | 3 | 4 | 4 | 4 | | | 3.8 | 4 | IR |
| 3522 | | | | | | | | | | | | 4 | 4 | 4 | 4 | 4 | | 4.0 | 5 | RC |
| 3523 | | | | | | | | | | | | 4 | 3 | 5 | | | | 4.0 | 3 | IR |
| 3524 | | | | | | | | | | | | 4 | 4 | 5 | | | | 4.3 | 3 | RC |
| 3525 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 3526 | | | | | | | | | | | | 4 | 4 | 4 | | | | 4.0 | 3 | RC |

D = diestrus, E = estrus, P = proestrus, c1, c2…c6 = cycle number, IR = irregular cycling, RC = regular cycling

| Females | Estrous cycle and mating data - individual observations | Appendix 14 |
|---|---|---|

| Animal Number | Phase Day | COH 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | Cycle length c1 | c2 | c3 | c4 | c5 | c6 | Mean length | Number of cycles | Status |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | |
| 4501 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 4502 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 4503 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 4504 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 4505 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 4506 | | | | | | | | | | | | 15 | | | | | | 15.0 | 1 | IR |
| 4507 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 4508 | | | | | | | | | | | | 3 | 5 | 5 | | | | 4.3 | 3 | IR |
| 4509 | | | | | | | | | | | | 3 | 5 | 3 | 4 | | | 3.8 | 4 | IR |
| 4510 | | | | | | | | | | | | 4 | 4 | 6 | | | | 4.7 | 3 | IR |
| 4511 | | | | | | | | | | | | 8 | 4 | 2 | | | | 4.7 | 3 | IR |
| 4512 | | | | | | | | | | | | 4 | 4 | 4 | | | | 4.0 | 3 | RC |
| 4513 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 4514 | | | | | | | | | | | | 4 | 4 | 4 | 2 | | | 3.5 | 4 | IR |
| 4515 | | | | | | | | | | | | 5 | 5 | 5 | | | | 5.0 | 3 | RC |
| 4516 | | | | | | | | | | | | 4 | 4 | 4 | | | | 4.0 | 3 | RC |
| 4517 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 4518 | | | | | | | | | | | | 4 | 7 | | | | | 5.5 | 2 | IR |
| 4519 | | | | | | | | | | | | 3 | 4 | 4 | 4 | | | 3.8 | 4 | IR |
| 4520 | | | | | | | | | | | | 4 | 4 | 4 | 3 | | | 3.8 | 4 | IR |
| 4521 | | | | | | | | | | | | 3 | 4 | 4 | 4 | | | 3.8 | 4 | IR |
| 4522 | | | | | | | | | | | | 4 | 4 | 4 | | | | 4.0 | 3 | RC |
| 4523 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 4524 | | | | | | | | | | | | 4 | 4 | 4 | 4 | | | 4.0 | 4 | RC |
| 4525 | | | | | | | | | | | | 4 | 5 | | | | | 4.5 | 2 | RC |
| 4526 | | | | | | | | | | | | 8 | 4 | | | | | 6.0 | 2 | IR |

c1, c2…c6 = cycle number, IR = irregular cycling, RC = regular cycling

| | Mating assigments - individual observations | Appendix 15 |
|---|---|---|

| Mating Assignments | | Confirmed | Days to | |
|---|---|---|---|---|
| Male | Female | Copulation | Mating | Pregnant |
| Group 1 - 0 mg/m$^3$ | | | | |
| 1001 | 1501 | Yes | 3 | Yes |
| 1002 | 1502 | Yes | 1 | Yes |
| 1003 | 1503 | Yes | 1 | Yes |
| 1004 | 1504 | No | 3[a] | No |
| 1005 | 1505 | Yes | 1 | Yes |
| 1006 | 1506 | Yes | 3 | Yes |
| 1007 | 1507 | Yes | 4 | Yes |
| 1008 | 1508 | Yes | 2 | Yes |
| 1009 | 1509 | Yes | 1 | Yes |
| 1010 | 1510 | Yes | 2 | Yes |
| 1011 | 1511 | Yes | 4 | Yes |
| 1012 | 1512 | Yes | 3 | No |
| 1013 | 1513 | Yes | 1 | Yes |
| 1014 | 1514 | Yes | 3 | Yes |
| 1015 | 1515 | Yes | 3 | Yes |
| 1016 | 1516 | Yes | 2 | Yes |
| 1017 | 1517 | Yes | 1 | Yes |
| 1018 | 1518 | Yes | 2 | Yes |
| 1019 | 1519 | Yes | 2 | Yes |
| 1020 | 1520 | Yes | 3 | Yes |

Confirmed copulation = females which had sperm observed in a vaginal smear or a copulatory plug in situ and were marked copulated, or pregnant females with no evidence of copulation.

Days to Mating = Number of days cohabited prior to sperm observed in the vagina or a copulatory plug in situ.

[a]Assumed on the basis of estrus cycle evaluations.

| | Mating assigments - individual observations | Appendix 15 |
|---|---|---|

| Mating Assignments | | Confirmed | Days to | |
|---|---|---|---|---|
| Male | Female | Copulation | Mating | Pregnant |
| Group 1 - 0 mg/m$^3$ | | | | |
| 1021 | 1521 | Yes | 2 | No |
| 1022 | 1522 | Yes | 3 | Yes |
| 1023 | 1523 | Yes | 1 | Yes |
| 1024 | 1524 | Yes | 1 | No |
| 1025 | 1525 | Yes | 4 | Yes |
| 1026 | 1526 | Yes | 3 | Yes |
| Mean | | | 2.3 | |
| S.D. | | | 1.04 | |
| N | | 25 | 26 | 22 |

Confirmed copulation = females which had sperm observed in a vaginal smear or a copulatory plug in situ and were marked copulated, or pregnant females with no evidence of copulation.

Days to Mating = Number of days cohabited prior to sperm observed in the vagina or a copulatory plug in situ.

| | Mating assigments - individual observations | Appendix 15 |
|---|---|---|

| Mating Assignments | | Confirmed | Days to | |
|---|---|---|---|---|
| Male | Female | Copulation | Mating | Pregnant |
| Group 2 - 2,000 mg/m$^3$ | | | | |
| 2001 | 2501 | Yes | 1 | Yes |
| 2002 | 2502 | Yes | 4 | Yes |
| 2003 | 2503 | Yes | 1 | Yes |
| 2004 | 2504 | Yes | 5 | Yes |
| 2005 | 2505 | Yes | 1 | No |
| 2006 | 2506 | Yes | 2 | Yes |
| 2007 | 2507 | Yes | 4 | Yes |
| 2008 | 2508 | Yes | 3 | No |
| 2009 | 2509 | Yes | 3 | Yes |
| 2010 | 2510 | Yes | 4 | Yes |
| 2011 | 2511 | Yes | 1 | No |
| 2012 | 2512 | Yes | 1 | Yes |
| 2013 | 2513 | Yes | 4 | Yes |
| 2014 | 2514 | Yes | 4 | Yes |
| 2015 | 2515 | Yes | 1 | Yes |
| 2016 | 2516 | Yes | 4 | Yes |
| 2017 | 2517 | Yes | 3 | Yes |
| 2018 | 2518 | Yes | 2 | Yes |
| 2019 | 2519 | Yes | 2 | Yes |
| 2020 | 2520 | Yes | 1 | Yes |

Confirmed copulation = females which had sperm observed in a vaginal smear or a copulatory plug in situ and were marked copulated, or pregnant females with no evidence of copulation.
Days to Mating = Number of days cohabited prior to sperm observed in the vagina or a copulatory plug in situ.

| | | |
|---|---|---|
| | Mating assigments - individual observations | Appendix 15 |

| Mating Assignments | | Confirmed | Days to | |
|---|---|---|---|---|
| Male | Female | Copulation | Mating | Pregnant |
| Group 2 - 2,000 mg/m$^3$ | | | | |
| 2021 | 2521 | Yes | 2 | Yes |
| 2022 | 2522 | Yes | 4 | Yes |
| 2023 | 2523 | Yes | 2 | Yes |
| 2024 | 2524 | Yes | 2[a] | Yes |
| 2025 | 2525 | No | - | No |
| 2026 | 2526 | Yes | 4 | Yes |
| Mean | | | 2.6 | |
| S.D. | | | 1.32 | |
| N | | 25 | 25 | 22 |

Confirmed copulation = females which had sperm observed in a vaginal smear or a copulatory plug in situ and were marked copulated, or pregnant females with no evidence of copulation.

Days to Mating = Number of days cohabited prior to sperm observed in the vagina or a copulatory plug in situ.

[a]Assumed on the basis of estrus cycle evaluations.

| | | |
|---|---|---|
| | Mating assigments - individual observations | Appendix 15 |

| Mating Assignments | | Confirmed | Days to | |
|---|---|---|---|---|
| Male | Female | Copulation | Mating | Pregnant |
| Group 3 - 10,000 mg/m$^3$ | | | | |
| 3001 | 3501 | Yes | 2 | Yes |
| 3004 | 3502 | Yes | 3 | No |
| 3003 | 3503 | Yes | 4 | Yes |
| 3004 | 3504 | Yes | 1 | Yes |
| 3005 | 3505 | Yes | 2 | Yes |
| 3006 | 3506 | Yes | 4 | Yes |
| 3007 | 3507 | Yes | 2 | Yes |
| 3008 | 3508 | Yes | 1 | Yes |
| 3009 | 3509 | Yes | 3 | Yes |
| 3010 | 3510 | Yes | 1 | Yes |
| 3011 | 3511 | Yes | 3 | Yes |
| 3012 | 3512 | Yes | 1 | Yes |
| 3013 | 3513 | Yes | 5 | Yes |
| 3014 | 3514 | Yes | 1 | Yes |
| 3015 | 3515 | Yes | 8[a] | Yes |
| 3016 | 3516 | Yes | 4 | Yes |
| 3017 | 3517 | Yes | - | No |
| 3018 | 3518 | Yes | 4 | Yes |
| 3019 | 3519 | Yes | 2 | No |
| 3020 | 3520 | Yes | 3 | Yes |

Confirmed copulation = females which had sperm observed in a vaginal smear or a copulatory plug in situ and were marked copulated, or pregnant females with no evidence of copulation.

Days to Mating = Number of days cohabited prior to sperm observed in the vagina or a copulatory plug in situ.

[a]Assumed on the basis of estrus cycle evaluations.

| | Mating assigments - individual observations | Appendix 15 |
|---|---|---|

| Mating Assignments | | Confirmed | Days to | |
|---|---|---|---|---|
| Male | Female | Copulation | Mating | Pregnant |
| Group 3 - 10,000 mg/m$^3$ | | | | |
| 3021 | 3521 | Yes | 3 | Yes |
| 3022 | 3522 | Yes | 7 | Yes |
| 3023 | 3523 | Yes | 1 | Yes |
| 3024 | 3524 | No | 1[a] | No |
| 3025 | 3525 | Yes | 4 | Yes |
| 3026 | 3526 | Yes | 1 | Yes |
| Mean | | | 2.8 | |
| S.D. | | | 1.89 | |
| N | | 25 | 25 | 22 |

Confirmed copulation = females which had sperm observed in a vaginal smear or a copulatory plug in situ and were marked copulated, or pregnant females with no evidence of copulation.

Days to Mating = Number of days cohabited prior to sperm observed in the vagina or a copulatory plug in situ.

[a]Assumed on the basis of estrus cycle evaluations.

| | | |
|---|---|---|
| | Mating assigments - individual observations | Appendix 15 |

| Mating Assignments | | Confirmed | Days to | |
|---|---|---|---|---|
| Male | Female | Copulation | Mating | Pregnant |
| Group 4 - 20,000 mg/m$^3$ | | | | |
| 4001 | 4501 | Yes | 3 | Yes |
| 4002 | 4502 | Yes | 4 | Yes |
| 4003 | 4503 | Yes | 4 | Yes |
| 4004 | 4504 | Yes | 2 | Yes |
| 4005 | 4505 | Yes | 4 | Yes |
| 4006 | 4506 | Yes | 2 | No |
| 4007 | 4507 | Yes | 4 | No |
| 4008 | 4508 | Yes | 1 | No |
| 4009 | 4509 | Yes | 3 | Yes |
| 4010 | 4510 | Yes | 1 | Yes |
| 4011 | 4511 | Yes | 1 | No |
| 4012 | 4512 | Yes | 4 | Yes |
| 4013 | 4513 | Yes | 3 | Yes |
| 4014 | 4514 | Yes | 1 | No |
| 4015 | 4515 | Yes | 1 | Yes |
| 4016 | 4516 | Yes | 1 | Yes |
| 4017 | 4517 | Yes | 3 | Yes |
| 4018 | 4518 | Yes | 1 | Yes |
| 4019 | 4519 | Yes | 3 | No |
| 4020 | 4520 | Yes | 3 | No |

Confirmed copulation = females which had sperm observed in a vaginal smear or a copulatory plug in situ and were marked copulated, or pregnant females with no evidence of copulation.
Days to Mating = Number of days cohabited prior to sperm observed in the vagina or a copulatory plug in situ.

| | | |
|---|---|---|
| | Mating assigments - individual observations | Appendix 15 |

| Mating Assignments | | Confirmed | Days to | |
|---|---|---|---|---|
| Male | Female | Copulation | Mating | Pregnant |
| Group 4 - 20,000 mg/m$^3$ | | | | |
| 4021 | 4521 | Yes | 3 | Yes |
| 4022 | 4522 | Yes | 4 | Yes |
| 4023 | 4523 | Yes | 4 | Yes |
| 4024 | 4524 | Yes | 3 | Yes |
| 4025 | 4525 | Yes | 1 | Yes |
| 4026 | 4526 | Yes | 4 | Yes |
| Mean | | | 2.6 | |
| S.D. | | | 1.24 | |
| N | | 26 | 26 | 19 |

Confirmed copulation = females which had sperm observed in a vaginal smear or a copulatory plug in situ and were marked copulated, or pregnant females with no evidence of copulation.

Days to Mating = Number of days cohabited prior to sperm observed in the vagina or a copulatory plug in situ.

| Female | Delivery and litter data - individual values | Appendix 16 |
|---|---|---|

| Animal Number | Gestation Length | Implantations (g) | Total on Day | | | Live litter size on Day | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | | | 1 | | | 4 Pre-Cull | | | 4 Post-Cull | | | 7 | | | 14 | | | 21 | | |
| | | | M | F | T | M | F | T | M | F | T | M | F | T | M | F | T | M | F | T | M | F | T |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 1501 | 22 | 15 | 11 | 4 | 15 | 11 | 4 | 15 | 11 | 4 | 15 | 6 | 4 | 10 | 6 | 4 | 10 | 6 | 4 | 10 | 6 | 4 | 10 |
| 1502 | 22 | 12 | 5 | 7 | 12 | 5 | 7 | 12 | 5 | 7 | 12 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 1503 | 23 | 13 | 5 | 7 | 12 | 5 | 6 | 11 | 5 | 6 | 11 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 1505 | 23 | 14 | 8 | 5 | 13 | 8 | 5 | 13 | 8 | 5 | 13 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 1506 | 23 | 13 | 4 | 7 | 11 | 4 | 6 | 10 | 4 | 6 | 10 | 4 | 6 | 10 | 4 | 6 | 10 | 4 | 6 | 10 | 4 | 6 | 10 |
| 1507 | 23 | 16 | 5 | 11 | 16 | 4 | 7 | 11 | 4 | 7 | 11 | 4 | 6 | 10 | 4 | 6 | 10 | 4 | 6 | 10 | 4 | 6 | 10 |
| 1508 | 22 | 12 | 5 | 8 | 13 | 5 | 8 | 13 | 5 | 8 | 13 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 1509 | 22 | 16 | 7 | 5 | 12 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1510 | 22 | 14 | 4 | 9 | 13 | 4 | 9 | 13 | 4 | 9 | 13 | 4 | 6 | 10 | 0 | 0 | 0 | 4 | 6 | 10 | 4 | 6 | 10 |
| 1511 | 23 | 15 | 7 | 9 | 16 | 7 | 8 | 15 | 7 | 8 | 15 | 5 | 5 | 10 | 4 | 5 | 9 | 5 | 5 | 10 | 5 | 5 | 10 |
| 1513 | 23 | 15 | 6 | 9 | 15 | 3 | 6 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1514 | 23 | 14 | 4 | 6 | 10 | 4 | 6 | 10 | 4 | 6 | 10 | 4 | 6 | 10 | 4 | 6 | 10 | 4 | 5 | 9 | 4 | 5 | 9 |
| 1515 | 21 | 14 | 7 | 6 | 13 | 7 | 6 | 13 | 7 | 6 | 13 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 1516 | 22 | 12 | 8 | 6 | 14 | 7 | 5 | 12 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 |
| 1517 | 23 | 13 | 7 | 6 | 13 | 6 | 5 | 11 | 6 | 4 | 10 | 6 | 4 | 10 | 6 | 4 | 10 | 6 | 4 | 10 | 5 | 4 | 9 |
| 1518 | 22 | 15 | 7 | 8 | 15 | 7 | 8 | 15 | 6 | 8 | 14 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 1519 | 22 | 15 | 7 | 5 | 12 | 7 | 4 | 11 | 5 | 1 | 6 | 5 | 1 | 6 | 5 | 1 | 6 | 5 | 1 | 6 | 5 | 1 | 6 |
| 1520 | 22 | 14 | 4 | 8 | 12 | 4 | 8 | 12 | 4 | 8 | 12 | 4 | 6 | 10 | 4 | 6 | 10 | 4 | 6 | 10 | 4 | 6 | 10 |
| 1522 | 22 | 14 | 4 | 8 | 12 | 4 | 8 | 12 | 4 | 7 | 11 | 4 | 6 | 10 | 4 | 6 | 10 | 4 | 5 | 9 | 0 | 0 | 0 |
| 1523 | 22 | 14 | 8 | 5 | 13 | 8 | 5 | 13 | 8 | 4 | 13 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 1525 | 22 | 15 | 9 | 5 | 14 | 6 | 3 | 9 | 6 | 3 | 9 | 6 | 3 | 9 | 6 | 3 | 9 | 6 | 3 | 9 | 6 | 3 | 9 |
| 1526 | 22 | 15 | 9 | 5 | 14 | 9 | 4 | 13 | 5 | 4 | 9 | 5 | 4 | 9 | 5 | 4 | 9 | 5 | 3 | 8 | 5 | 3 | 8 |

| Females | Delivery and litter data - individual values | Appendix 16 |
|---|---|---|

| Animal Number | Gestation Length | Implantations (g) | Total on Day 1 | | | Live litter size on Day 1 | | | 4 Pre-Cull | | | 4 Post-Cull | | | 7 | | | 14 | | | 21 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | M | F | T | M | F | T | M | F | T | M | F | T | M | F | T | M | F | T | M | F | T |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 2501 | 22 | 14 | 8 | 6 | 14 | 8 | 6 | 14 | 8 | 5 | 13 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 2502 | 22 | 15 | 7 | 8 | 15 | 6 | 6 | 12 | 6 | 6 | 12 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 2503 | 22 | 8 | 7 | 2 | 9 | 7 | 2 | 9 | 7 | 2 | 9 | 7 | 2 | 9 | 7 | 2 | 9 | 7 | 2 | 9 | 7 | 2 | 9 |
| 2504 | 23 | 18 | 11 | 4 | 15 | 11 | 4 | 15 | 9 | 3 | 12 | 7 | 3 | 10 | 7 | 2 | 9 | 7 | 2 | 9 | 9 | 0 | 9 |
| 2506 | 23 | 16 | 6 | 8 | 15 | 5 | 4 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2507 | 22 | 19 | 10 | 5 | 15 | 9 | 5 | 14 | 9 | 5 | 14 | 9 | 5 | 14 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 2509 | 23 | 16 | 6 | 9 | 15 | 6 | 6 | 12 | 5 | 4 | 9 | 5 | 4 | 9 | 5 | 4 | 9 | 5 | 4 | 9 | 5 | 4 | 9 |
| 2510 | 22 | 15 | 10 | 3 | 13 | 10 | 2 | 12 | 10 | 2 | 12 | 8 | 2 | 10 | 8 | 2 | 10 | 8 | 2 | 10 | 8 | 2 | 10 |
| 2512 | 22 | 13 | 8 | 5 | 13 | 8 | 5 | 13 | 6 | 3 | 9 | 6 | 3 | 9 | 6 | 3 | 9 | 6 | 3 | 9 | 6 | 3 | 9 |
| 2513 | 22 | 13 | 6 | 6 | 12 | 6 | 6 | 12 | 6 | 6 | 12 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 2514 | 22 | 13 | 6 | 6 | 12 | 6 | 6 | 12 | 6 | 6 | 12 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 2515 | 22 | 16 | 9 | 5 | 14 | 9 | 4 | 13 | 9 | 4 | 13 | 6 | 4 | 10 | 6 | 4 | 10 | 6 | 4 | 10 | 6 | 4 | 10 |
| 2516 | 23 | 15 | 9 | 5 | 14 | 7 | 3 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2517 | 22 | 16 | 4 | 10 | 14 | 4 | 10 | 14 | 4 | 10 | 14 | 4 | 6 | 10 | 4 | 6 | 10 | 4 | 6 | 10 | 4 | 6 | 10 |
| 2518 | 22 | 15 | 6 | 7 | 13 | 6 | 7 | 13 | 6 | 5 | 11 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 4 | 9 | 5 | 4 | 9 |
| 2519 | 22 | 11 | 3 | 7 | 10 | 3 | 6 | 9 | 3 | 6 | 9 | 3 | 6 | 9 | 3 | 6 | 9 | 3 | 6 | 9 | 3 | 6 | 9 |
| 2520 | 22 | 12 | 9 | 4 | 13 | 9 | 4 | 13 | 7 | 2 | 9 | 7 | 2 | 9 | 7 | 2 | 9 | 7 | 2 | 9 | 7 | 2 | 9 |
| 2521 | 22 | 14 | 7 | 6 | 13 | 7 | 6 | 13 | 7 | 6 | 13 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 2522 | 22 | 16 | 6 | 9 | 15 | 6 | 8 | 14 | 6 | 7 | 13 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 2523 | 22 | 13 | 10 | 3 | 13 | 8 | 2 | 10 | 7 | 2 | 9 | 7 | 2 | 9 | 7 | 2 | 9 | 7 | 2 | 9 | 7 | 2 | 9 |
| 2524 | 21 | 15 | 7 | 4 | 11 | 7 | 4 | 11 | 7 | 3 | 10 | 7 | 3 | 10 | 7 | 3 | 10 | 7 | 3 | 10 | 7 | 3 | 10 |
| 2526 | 23 | 15 | 8 | 6 | 14 | 8 | 4 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Females | Delivery and litter data - individual values | Appendix 16 |
|---|---|---|

| Animal Number | Gestation Length | Implantations (g) | Total on Day 1 | | | Live litter size on Day 1 | | | 4 Pre-Cull | | | 4 Post-Cull | | | 7 | | | 14 | | | 21 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | M | F | T | M | F | T | M | F | T | M | F | T | M | F | T | M | F | T | M | F | T |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 3501 | 22 | 15 | 8 | 5 | 13 | 8 | 4 | 12 | 8 | 4 | 12 | 6 | 4 | 10 | 6 | 4 | 10 | 6 | 4 | 10 | 6 | 4 | 10 |
| 3503 | 23 | 13 | 6 | 7 | 13 | 6 | 7 | 13 | 6 | 7 | 13 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 3504 | 23 | 15 | 11 | 3 | 14 | 9 | 1 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3505 | 22 | 17 | 6 | 7 | 13 | 6 | 6 | 12 | 6 | 6 | 12 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 3506 | 22 | 17 | 5 | 7 | 12 | 5 | 7 | 12 | 5 | 7 | 12 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 3507 | 22 | 14 | 7 | 9 | 16 | 5 | 9 | 14 | 2 | 3 | 5 | 2 | 3 | 5 | 2 | 3 | 5 | 1 | 2 | 3 | 1 | 2 | 3 |
| 3508 | 22 | 11 | 9 | 4 | 13 | 9 | 4 | 13 | 9 | 4 | 13 | 6 | 4 | 10 | 6 | 4 | 10 | 6 | 4 | 10 | 6 | 4 | 10 |
| 3509 | 22 | 14 | 5 | 9 | 14 | 5 | 7 | 12 | 5 | 7 | 12 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 3510 | 22 | 13 | 5 | 6 | 11 | 5 | 6 | 11 | 5 | 6 | 11 | 5 | 5 | 10 | 5 | 5 | 10 | 4 | 5 | 9 | 4 | 5 | 9 |
| 3511 | 22 | 12 | 5 | 1 | 6 | 5 | 1 | 6 | 5 | 1 | 6 | 5 | 1 | 6 | 5 | 1 | 6 | 5 | 1 | 6 | 5 | 1 | 6 |
| 3512 | 23 | 16 | 10 | 5 | 15 | 10 | 5 | 15 | 10 | 4 | 14 | 6 | 4 | 10 | 6 | 4 | 10 | 6 | 4 | 10 | 6 | 4 | 10 |
| 3513 | 22 | 13 | 10 | 1 | 11 | 10 | 1 | 11 | 10 | 1 | 11 | 9 | 1 | 10 | 9 | 1 | 10 | 9 | 1 | 10 | 9 | 1 | 10 |
| 3514 | 22 | 8 | 4 | 4 | 8 | 4 | 4 | 8 | 4 | 4 | 8 | 4 | 4 | 8 | 4 | 4 | 8 | 4 | 4 | 8 | 4 | 4 | 8 |
| 3515 | 18 | 10 | 7 | 2 | 9 | 7 | 2 | 9 | 7 | 2 | 9 | 7 | 2 | 9 | 7 | 2 | 9 | 7 | 2 | 9 | 7 | 2 | 9 |
| 3516 | 23 | 15 | 8 | 6 | 14 | 8 | 6 | 14 | 8 | 6 | 14 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 3518 | 23 | 16 | 9 | 7 | 16 | 8 | 6 | 14 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| 3520 | 23 | 17 | 5 | 10 | 15 | 5 | 10 | 15 | 5 | 10 | 15 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 3521 | 23 | 15 | 4 | 8 | 12 | 4 | 8 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3522 | 22 | 14 | 7 | 8 | 15 | 7 | 8 | 15 | 7 | 8 | 15 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 3523 | 23 | 15 | 5 | 9 | 14 | 5 | 8 | 13 | 5 | 6 | 11 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 3525 | 22 | 14 | 5 | 6 | 11 | 5 | 6 | 11 | 5 | 6 | 11 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 3526 | 22 | 8 | 7 | 4 | 11 | 7 | 4 | 11 | 7 | 4 | 11 | 6 | 4 | 10 | 6 | 4 | 10 | 6 | 4 | 10 | 6 | 4 | 10 |

| Females | Delivery and litter data - individual values | Appendix 16 |
|---|---|---|

| Animal Number | Gestation Length | Implantations (g) | Total on Day | | | Live litter size on Day | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | | | 1 | | | 4 Pre-Cull | | | 4 Post-Cull | | | 7 | | | 14 | | | 21 | | |
| | | | M | F | T | M | F | T | M | F | T | M | F | T | M | F | T | M | F | T | M | F | T |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 4501 | 22 | 18 | 9 | 8 | 17 | 9 | 7 | 16 | 9 | 6 | 15 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 4502 | 22 | 12 | 7 | 2 | 9 | 7 | 2 | 9 | 7 | 2 | 9 | 7 | 2 | 9 | 7 | 2 | 9 | 7 | 2 | 9 | 7 | 2 | 9 |
| 4503 | 22 | 16 | 5 | 10 | 15 | 5 | 9 | 14 | 3 | 5 | 8 | 3 | 5 | 8 | 3 | 5 | 8 | 3 | 5 | 8 | 3 | 5 | 8 |
| 4504 | 22 | 14 | 5 | 6 | 11 | 5 | 6 | 11 | 5 | 6 | 11 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 4505 | 22 | 17 | 6 | 8 | 14 | 6 | 8 | 14 | 6 | 8 | 14 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 4509 | 22 | 14 | 6 | 8 | 14 | 6 | 8 | 14 | 6 | 8 | 14 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 4510 | 22 | 15 | 10 | 3 | 13 | 10 | 3 | 13 | 10 | 3 | 13 | 7 | 3 | 10 | 7 | 3 | 10 | 7 | 3 | 10 | 7 | 3 | 10 |
| 4512 | 22 | 13 | 5 | 7 | 12 | 5 | 7 | 12 | 5 | 6 | 11 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 4513 | 22 | 12 | 6 | 8 | 14 | 6 | 8 | 14 | 6 | 8 | 14 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 4 | 5 | 9 |
| 4515 | 23 | 13 | 6 | 7 | 13 | 6 | 7 | 13 | 6 | 7 | 13 | 5 | 5 | 10 | 5 | 4 | 9 | 5 | 4 | 9 | 5 | 4 | 9 |
| 4516 | 22 | 14 | 7 | 7 | 14 | 7 | 7 | 14 | 7 | 7 | 14 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 4517 | 22 | 14 | 4 | 9 | 13 | 4 | 9 | 13 | 4 | 9 | 13 | 4 | 6 | 10 | 4 | 6 | 10 | 4 | 6 | 10 | 4 | 6 | 10 |
| 4518 | 23 | 15 | 6 | 6 | 12 | 6 | 6 | 12 | 6 | 6 | 12 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 4521 | 22 | 15 | 7 | 6 | 13 | 7 | 6 | 13 | 7 | 6 | 13 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 4522 | 22 | 18 | 7 | 8 | 15 | 7 | 8 | 15 | 7 | 8 | 15 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 4523 | 22 | 15 | 5 | 9 | 14 | 5 | 9 | 14 | 5 | 9 | 14 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |
| 4524 | 23 | 11 | 2 | 9 | 11 | 2 | 9 | 11 | 2 | 8 | 10 | 2 | 8 | 10 | 2 | 8 | 10 | 2 | 8 | 10 | 2 | 8 | 10 |
| 4525 | 23 | 19 | 9 | 5 | 14 | 6 | 3 | 9 | 5 | 3 | 8 | 5 | 3 | 8 | 5 | 2 | 7 | 5 | 2 | 7 | 5 | 2 | 7 |
| 4526 | 22 | 15 | 8 | 6 | 14 | 8 | 6 | 14 | 8 | 6 | 14 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 | 5 | 5 | 10 |

| | | |
|---|---|---|
| | Pup clinical observations - individual observations<br>Preface | Appendix 17 |

**Litter observations:** Litter observations were documented on PND 1, 4, 7, 14 and 21. Observations of dead or missing pups between these days were documented when noted.

**Key to Abbreviations:**

C = Culled
CA = Cannibalized
FD = Found dead
HS = Humane sacrifice
L = Left
MI = Missing
P = Present
PC = Partially cannibalized
R = Right

| | Pup clinical observations - individual observations | Appendix 17 |
|---|---|---|

| Dam Number | Observations | Postnatal Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 1501 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 7 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 8 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 9 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 10 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 11 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| 1502 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 11 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 12 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| 1503 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | - | - | - | - | - | - | - | P |
| | Pup 11 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 8 - Digit missing, L hind paw | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | - |
| 1505 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | - | - | - | - | - | - | - | P |
| | Pup 6 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 7 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 8 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 10 - Digit missing, L forepaw | | | | | | | | | | | | | | | P | | | | | | | |
| | Pup 11 - Digit missing, bilateral forepaws | | | | | | | | | | | | | | | P | | | | | | | |
| 1506 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| 1507 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 11 | | | | | C | | | | | | | | | | | | | | | | | |

| | Pup clinical observations - individual observations | Appendix 17 |
|---|---|---|

| Dam Number | Observations | Postnatal Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 1508 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | - | - | - | - | - | - | - | P |
| | Pup 11 | - | P | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 12 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 13 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 4 - Missing digit, R hind paw | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | | | | | | | |
| | Pup 5 - Missing digit, R hind paw | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | | | | | | | |
| 1509 | Pup 1 - No milk in stomach | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 1 - Cold to touch | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 1 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 2 | - | FD | | | | | | | | | | | | | | | | | | | | |
| | Pup 3 | - | FD | | | | | | | | | | | | | | | | | | | | |
| | Pup 4 | - | FD | | | | | | | | | | | | | | | | | | | | |
| | Pup 5 | - | FD | | | | | | | | | | | | | | | | | | | | |
| | Pup 6 | - | FD | | | | | | | | | | | | | | | | | | | | |
| | Pup 7 | - | FD | | | | | | | | | | | | | | | | | | | | |
| | Pup 8 | - | FD | | | | | | | | | | | | | | | | | | | | |
| | Pup 9 | - | FD | | | | | | | | | | | | | | | | | | | | |
| | Pup 11 | - | FD | | | | | | | | | | | | | | | | | | | | |
| | Pup 12 | - | FD | | | | | | | | | | | | | | | | | | | | |
| | Pup 13 | - | FD | | | | | | | | | | | | | | | | | | | | |

| | Pup clinical observations - individual observations | Appendix 17 |
|---|---|---|

| Dam Number | Observations | Postnatal Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 1510 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 11 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 12 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 13 | | | | | C | | | | | | | | | | | | | | | | | |
| 1511 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 6 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 7 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 13 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 14 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 15 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| 1513 | All live pups within normal limits | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 10 | - | FD | | | | | | | | | | | | | | | | | | | | |
| | Pup 1- Pale | - | - | P | | | | | | | | | | | | | | | | | | | |
| | Pup 1 - Cold to touch | - | - | P | | | | | | | | | | | | | | | | | | | |
| | Pup 4- Cold to touch | - | - | P | | | | | | | | | | | | | | | | | | | |
| | Pup 1 - No milk in stomach | - | - | P | | | | | | | | | | | | | | | | | | | |
| | Pup 4- No milk in stomach | - | - | P | | | | | | | | | | | | | | | | | | | |
| | Pup 1 - Moribund | - | - | P | | | | | | | | | | | | | | | | | | | |
| | Pup 4- Moribund | - | - | P | | | | | | | | | | | | | | | | | | | |
| | Pup 2 | - | - | MI | | | | | | | | | | | | | | | | | | | |

| | Pup clinical observations - individual observations | Appendix 17 |
|---|---|---|

| Dam Number | Observations | Postnatal Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 1513 | Pup 3 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 7 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 8 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 9 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 5 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 6 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| 1514 | All live pups within normal limits | - | P | - | - | P | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 10 - Cold to touch | - | - | - | - | - | - | - | P | | | | | | | | | | | | | | |
| | Pup 10 - Pale | - | - | - | - | - | - | - | P | | | | | | | | | | | | | | |
| 1515 | All live pups within normal limits | - | - | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 7 - Pale | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 6 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 7 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 13 | | | | | C | | | | | | | | | | | | | | | | | |
| 1516 | All live pups within normal limits | - | - | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 1 - Bruising | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 6 - Bruising | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 6 - Pale | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 9 - Pale | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 3 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 6 | - | - | MI | | | | | | | | | | | | | | | | | | | |

| | Pup clinical observations - individual observations | Appendix 17 |
|---|---|---|

| Dam Number | Observations | Postnatal Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 1516 | Pup 9 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 1 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 2 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 7 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 8 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 12 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| 1517 | All live pups within normal limits | - | P | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 4 - Scab | - | - | - | - | P | | | | | | | | | | | | | | | | | |
| | Pup 11 | - | - | - | - | FD | | | | | | | | | | | | | | | | | |
| | Pup 4 - Scab ventral | - | - | - | - | - | - | - | P | | | | | | | | | | | | | | |
| 1518 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 7 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 13 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 14 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 15 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| 1519 | All live pups within normal limits | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 6 - Missing limb, hind limb | - | - | P | | | | | | | | | | | | | | | | | | | |
| | Pup 6 - Missing tail | - | - | P | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 9 - Missing limb, L Forepaw | - | - | P | | | | | | | | | | | | | | | | | | | |
| | Pup 9 - Missing tail | - | - | P | | | | | | | | | | | | | | | | | | | |
| | Pup 5 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 7 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 8 | - | - | MI | | | | | | | | | | | | | | | | | | | |

| | Pup clinical observations - individual observations | Appendix 17 |
|---|---|---|

| Dam Number | Observations | Postnatal Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 1519 | Pup 10 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 9 | - | - | - | - | MI | | | | | | | | | | | | | | | | | |
| | Pup 4 - Missing tail | - | - | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 6 - Missing limb, bilateral | - | - | - | - | - | - | - | P | | | | | | | | | | | | | | |
| | Pup 6 - missing limb, both hind limbs | - | - | - | - | - | - | - | - | - | - | - | - | - | | -P | - | - | - | - | - | - | P |
| | Pup 11 - Swollen L hind paw[a] | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | | | | | | | |
| | Pup 11 - Missing limb, L hind paw | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P |
| 1520 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 11 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 12 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| 1522 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | | | | | | | |
| | Pup 9 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 12 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 6 | - | - | - | - | - | - | FD | | | | | | | | | | | | | | | |
| | Pup 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | FD | | | | | |
| | Pup 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | FD | | | | |
| | Pup 5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | FD | | | | |
| | Pup 10 | - | - | - | - | - | - | - | - | - | - | | - | - | - | - | - | - | FD | | | | |
| | Pup 11 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | FD | | | | |
| | Pup 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | FD | | | |
| | Pup 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | FD | | | |
| | Pup 7 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | FD | | | |
| | Pup 8 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | FD | | | |

[a]Mass on lower dorsal surface

| | Pup clinical observations - individual observations | Appendix 17 |
|---|---|---|

| Dam Number | Observations | Postnatal Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 1523 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 6 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 7 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 8 | | | | | C | | | | | | | | | | | | | | | | | |
| 1525 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| 1526 | Pup 2 - Missing tail | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 13 - Missing tail | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 4 - Bruising | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 5 - Bruising | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 6 - Bruising | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 7 - Bruising | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 9 - Bruising | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 3 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 5 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 7 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 8 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 6 - Missing limb[a] | - | - | - | - | P | - | - | P | | | | | | | | | | | | | | |
| | Pup 6 - Missing limb, R hind limb | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 6 - Pale | - | - | - | - | P | - | - | P | | | | | | | | | | | | | | |
| | Pup 12 - Pale | - | - | - | - | P | - | - | P | | | | | | | | | | | | | | |
| | Pup 13 - Pale | - | - | - | - | P | - | - | P | | | | | | | | | | | | | | |

[a]Limb not specified

| | Pup clinical observations - individual observations | Appendix 17 |
|---|---|---|

| Dam Number | Observations | Postnatal Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
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| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 2501 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 14 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 6 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 7 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 8 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| 2502 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 6 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 12 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| 2503 | All live pups within normal limits | - | P | - | - | P | - | - | P | | | | | | | | | | | | | | |
| | Pup 5 - Missing digit, R forelimb | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| 2504 | All live pups within normal limits | - | - | - | - | P | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 3 | - | CA | | | | | | | | | | | | | | | | | | | | |
| | Pup 14 | - | - | - | FD | | | | | | | | | | | | | | | | | | |
| | Pup 11 | - | - | - | - | FD | | | | | | | | | | | | | | | | | |
| | Pup 15 | - | - | - | - | - | FD | | | | | | | | | | | | | | | | |
| | Pup 7 - Swollen, L forepaw | - | - | - | - | - | - | - | P | | | | | | | | | | | | | | |
| 2506 | Pup 1 Bruising | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 1 | - | - | FD | | | | | | | | | | | | | | | | | | | |

| | Pup clinical observations - individual observations | Appendix 17 |
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| Dam Number | Observations | Postnatal Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
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| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 2506 | Pup 2 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 3 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 4 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 5 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 6 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 7 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 8 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 9 - No milk in stomach | - | - | P | | | | | | | | | | | | | | | | | | | |
| | Pup 9 - Cold to touch | - | - | P | | | | | | | | | | | | | | | | | | | |
| | Pup 9 - Moribund | - | - | P | | | | | | | | | | | | | | | | | | | |
| 2507 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 6 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 7 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 8 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 9 | | | | | C | | | | | | | | | | | | | | | | | |
| 2509 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 6 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 10 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 12 | | | MI | | | | | | | | | | | | | | | | | | | |
| 2510 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 9 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 10 | - | - | - | - | C | | | | | | | | | | | | | | | | | |

| | Pup clinical observations - individual observations | Appendix 17 |
|---|---|---|

| Dam Number | Observations | Postnatal Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 2512 | All live pups within normal limits | - | P | - | - | P | - | - | P | | | | | | | | | | | | | | |
| | Pup 7 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 8 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 9 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 12 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 2 - Missing digit, L forepaw | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 3 - Missing digit, R forepaw | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 6 - Missing digit - L forepaw | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 10 - Missing digit L forepaw and L hind paw | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 13 - Missing digit, R forepaw | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 13 - Swollen, R forepaw | - | - | - | - | - | - | - | - | - | - | - | - | | - | P | | | | | | | |
| 2513 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 6 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 12 | | | | | C | | | | | | | | | | | | | | | | | |
| 2514 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 6 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 12 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| 2515 | All live pups within normal limits | - | P | - | - | P | - | - | P | | | | | | | | | | | | | | |
| | Pup 7 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 8 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 9 | - | - | - | - | C | | | | | | | | | | | | | | | | | |

| | Pup clinical observations - individual observations | Appendix 17 |
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| Dam Number | Observations | Postnatal Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
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| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 2515 | Pup 4 - Missing digit, R forepaw | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 12 - Missing digit, R forepaw | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 13 - Missing digit, R forepaw | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| 2516 | All live pups within normal limits | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 5 | | | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 7 | | | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 8 | | | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 10 | | | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 1 | | | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 2 | | | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 3 | | | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 4 | | | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 6 | | | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 9 | | | FD | | | | | | | | | | | | | | | | | | | |
| 2517 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 11 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 12 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 13 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 14 | - | - | - | - | C | | | | | | | | | | | | | | | | | |

| | Pup clinical observations - individual observations | Appendix 17 |
|---|---|---|

| Dam Number | Observations | Postnatal Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 2518 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | | | | | | | |
| | Pup 10 | | | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 11 | | | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 6 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 13 | | | | | | | | | | | | FD | | | | | | | | | | |
| | Pup 2 - Missing digit, both forepaws | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P |
| 2519 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| 2520 | All live animals within normal limits | - | P | - | - | P | - | - | P | | | | | | | | | | | | | | |
| | Pup 7 | | | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 9 | | | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 11 | | | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 12 | | | | MI | | | | | | | | | | | | | | | | | | |
| | Pup 2 - Missing digit, L forepaw | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 3 - Missing digit, L forepaw | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 13 - Swollen, R forepaw | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| 2521 | All live pups within normal limits | - | P | - | - | P | - | - | P | | | | | | | | | | | | | | |
| | Pup 6 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 7 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 13 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 1 - Swollen, R forepaw | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |

| | Pup clinical observations - individual observations | Appendix 17 |
|---|---|---|

| Dam Number | Observations | Postnatal Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 2522 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 15 | - | FD | | | | | | | | | | | | | | | | | | | | |
| | Pup 9 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 6 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 13 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 14 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| 2523 | All live pups within normal limits | - | P | - | - | P | - | - | P | | | | | | | | | | | | | | |
| | Pup 8 | | | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 2 - Missing digit, L forepaw[a] | | | | | | | | | | | | | | | P | | | | | | | P |
| | Pup 4 - Missing digit, R hind paw | | | | | | | | | | | | | | | P | | | | | | | P |
| | Pup 9 - Missing digit, R forepaw and L hind paw | | | | | | | | | | | | | | | P | | | | | | | P |
| | Pup 10 Missing digit, L hind paw | | | | | | | | | | | | | | | P | | | | | | | P |
| 2524 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 11 | | | MI | | | | | | | | | | | | | | | | | | | |
| 2526 | Pup 4 - Missing ear, Left | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 4 - Laceration | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 6 - Laceration | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 1 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 3 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 5 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 7 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 8 | - | - | MI | | | | | | | | | | | | | | | | | | | |

[a]Mass lower ventral

| | Pup clinical observations - individual observations | Appendix 17 |
|---|---|---|

| Dam Number | Observations | Postnatal Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 2526 | Pup 9 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 10 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 11 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 12 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 2 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 4 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 6 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 3501 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 6 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 7 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| 3503 | All live pups within normal limits | - | P | - | - | P | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 6 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 12 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 13 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 10 - Swollen, L forepaw | - | - | - | - | - | - | - | P | | | | | | | | | | | | | | |
| 3504 | Pup 8 - Bruising | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 2 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 3 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 6 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 8 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 7 | - | - | MI | | | | | | | | | | | | | | | | | | | |

| | Pup clinical observations - individual observations | Appendix 17 |
|---|---|---|

| Dam Number | Observations | Postnatal Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 3504 | Pup 1 | - | - | - | MI | | | | | | | | | | | | | | | | | | |
| | Pup 4 | - | - | - | MI | | | | | | | | | | | | | | | | | | |
| | Pup 5 | - | - | - | MI | | | | | | | | | | | | | | | | | | |
| | Pup 9 | - | - | - | MI | | | | | | | | | | | | | | | | | | |
| | Pup 10 | - | - | - | MI | | | | | | | | | | | | | | | | | | |
| 3505 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 6 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 12 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| 3506 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 11 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 12 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| 3507 | All live pups within normal limits | - | - | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 7 - Bruising | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 8 - Bruising | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 1[a] | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 2[a] | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 7[a] | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 8[a] | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 10[a] | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 14[a] | - | - | MI | | | | | | | | | | | | | | | | | | | |

[a]One partially unidentifiable fetus found

| | Pup clinical observations - individual observations | Appendix 17 |
|---|---|---|

| Dam Number | Observations | Postnatal Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 3507 | Pup 3 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 6 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 12 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 4 | - | - | - | - | - | - | - | - | - | MI | | | | | | | | | | | | |
| | Pup 9 | - | - | - | - | - | - | - | - | -- | - | - | - | MI | | | | | | | | | |
| 3508 | All pups within normal limits | - | P | - | - | P | - | - | P | | | | | | | | | | | | | | |
| | Pup 7 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 8 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 9 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 3 - Missing digit, right forepaw | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 5 - Missing digit, right hind limb | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 10 - Missing digit, left hind limb | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 11 - Missing digit, left hind limb | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 13 - Missing digit, left hind limb | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| 3509 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 11 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 12 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| 3510 | All live pups within normal limits | | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 9 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 6 - Bruising, upper dorsal | | | | | P | | | | | | | | | | | | | | | | | |
| | Pup 9 - No milk in stomach | | | | | P | | | | | | | | | | | | | | | | | |
| | Pup 10 - Pale | | | | | P | | | P | | | | | | | | | | | | | | |

| | Pup clinical observations - individual observations | Appendix 17 |
|---|---|---|

| Dam Number | Observations | Postnatal Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 3510 | Pup 6 - Missing digit, L forelimb | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 11 - Missing digit, R forelimb | - | - | - | - | - | - | - | -- | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 11 - Swollen right forelimb | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| 3511 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| 3512 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 6 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 7 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 8 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 9 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 14 | - | - | - | - | FD | | | | | | | | | | | | | | | | | |
| 3513 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 10 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| 3514 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| 3515 | All live pups within normal limits | - | P | - | - | P | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 8 - Swollen R forepaw | - | - | - | - | - | - | - | P | | | | | | | | | | | | | | |
| 3516 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 6 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 7 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 8 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 14 | - | - | - | - | C | | | | | | | | | | | | | | | | | |

| | Pup clinical observations - individual observations | Appendix 17 |
|---|---|---|

| Dam Number | Observations | Postnatal Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 3518 | All live pups within normal limits | - | - | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 3 - Cold to touch | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 4 - Cold to touch | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 5 - Cold to touch | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 6 - Cold to touch | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 7 - Cold to touch | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 8 - Cold to touch | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 9 - Cold to touch | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 10 - Cold to touch | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 11 - Cold to touch | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 12 - Cold to touch | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 13 - Cold to touch | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 14 - Cold to touch | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 7 - Laceration | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 1 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 2 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 5 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 8 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 9 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 11 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 12 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 14 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 3 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 4 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 7 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 10 | - | - | FD | | | | | | | | | | | | | | | | | | | |

| | Pup clinical observations - individual observations | Appendix 17 |
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| Dam Number | Observations | Postnatal Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 3518 | Pup 13 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| 3520 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 11 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 12 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 13 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 14 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 15 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| 3521 | All live pups within normal limits | - | P | | | | | | | | | | | | | | | | | | | | |
| | Pup 1 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 2 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 3 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 4 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 6 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 7 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 8 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 9 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 10 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 12 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 5 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| | Pup 11 | - | - | FD | | | | | | | | | | | | | | | | | | | |
| 3522 | All live pups within normal limits | | | | | | | | P | | | | | | | P | | | | | | | P |
| | Pup 6 - Discoloration black, tail | - | P | - | - | P | | | | | | | | | | | | | | | | | |
| | Pup 6 | - | - | - | - | C | | | | | | | | | | | | | | | | | |

| | Pup clinical observations - individual observations | Appendix 17 |
|---|---|---|

| Dam Number | Observations | Postnatal Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 3522 | Pup 7 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 13 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 14 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 15 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| 3523 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 11 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 13 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 12 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| 3525 | All live pups within normal limits | - | P | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 11 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 4 - Scab, ventral | - | - | - | - | P | - | - | P | | | | | | | | | | | | | | |
| | Pup 4 - Swollen R hind paw | - | - | - | - | - | - | - | P | | | | | | | | | | | | | | |
| 3526 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 7 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| Group 4 - 20,000 mg/m3 | | | | | | | | | | | | | | | | | | | | | | | |
| 4501 | All live pups within normal limits | - | P | - | - | - | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 9 - Limb missing, R hind limb | - | - | P | - | P | | | | | | | | | | | | | | | | | |
| | Pup 9 - Tail missing | - | - | P | - | P | | | | | | | | | | | | | | | | | |
| | Pup 6 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 7 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 8 | - | - | - | - | C | | | | | | | | | | | | | | | | | |

| | Pup clinical observations - individual observations | Appendix 17 |
|---|---|---|

| Dam Number | Observations | Postnatal Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 4501 | Pup 9 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 16 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| 4502 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| 4503 | All live pups within normal limits | - | P | - | - | P | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P |
| | Pup 15 | - | FD | | | | | | | | | | | | | | | | | | | | |
| | Pup 1 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 2 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 7 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 10 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 13 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 6 | - | - | - | FD | | | | | | | | | | | | | | | | | | |
| | Pup 14 - Scab, head | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P | | | | | | | |
| 4504 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 11 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| 4505 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 6 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 12 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 13 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 14 | | | | | C | | | | | | | | | | | | | | | | | |
| 4509 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | | | | | | | |
| | Pup 6 | | | | | C | | | | | | | | | | | | | | | | | |

| | Pup clinical observations - individual observations | Appendix 17 |
|---|---|---|

| Dam Number | Observations | Postnatal Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 4509 | Pup 12 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 13 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 14 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 2 - Discolored black | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P |
| 4510 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 8 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 9 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 10 | | | | | C | | | | | | | | | | | | | | | | | |
| 4512 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 11 | - | - | MI | | | | | | | | | | | | | | | | | | | |
| | Pup 12 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| 4513 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 6 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 12 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 13 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 14 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 4 | | | | | | | | | | | | | | | | | | | | | | FD |
| 4515 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 6 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 12 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 13 | | | | | C | | | | | | | | | | | | | | | | | |
| | Pup 9 | | | | | | | MI | | | | | | | | | | | | | | | |

| | Pup clinical observations - individual observations | Appendix 17 |
|---|---|---|

| Dam Number | Observations | Postnatal Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| | | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| 4516 | All live pups within normal limits | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 6 | | | | | | | | | | | | | | | | | | | | | | |
| | Pup 7 | | | | | | | | | | | | | | | | | | | | | | |
| 4516 | Pup 13 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 14 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 1 - Missing digit, R forelimb | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | | | | | | | |
| | Pup 2 - Missing digit, L forelimb | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | | | | | | | |
| | Pup 9 - Missing digit, L hind paw | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | | | | | | | |
| | Pup 11 - Missing digit L hind paw | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | | | | | | | |
| | Pup 12 - Missing digit, R hind paw | - | - | - | - | - | - | - | - | - | - | - | - | - | - | P | | | | | | | |
| 4517 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 11 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 12 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 13 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | | - | - | - | - | | | | | | | | | | | | | | | | | | |
| 4518 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 11 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 12 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| 4521 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 6 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 7 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 13 | - | - | - | - | C | | | | | | | | | | | | | | | | | |

| | Pup clinical observations - individual observations | Appendix 17 |
|---|---|---|

| Dam Number | Observations | Postnatal Day 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | | | | |
| 4522 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 6 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 7 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 8 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 14 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 15 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| 4523 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 11 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 12 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 13 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 14 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| 4524 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 10 | - | - | - | MI | - | | | | | | | | | | | | | | | | | |
| 4525 | All live pups within normal limits | - | P | - | - | - | - | - | - | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 8 - Scab, ventral | - | - | - | - | P | - | - | - | - | - | - | - | - | - | | - | - | - | - | - | - | - |
| | Pup 7 | - | - | - | - | - | - | - | MI | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4526 | All live pups within normal limits | - | P | - | - | P | - | - | P | - | - | - | - | - | - | P | - | - | - | - | - | - | P |
| | Pup 6 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 7 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 8 | - | - | - | - | C | | | | | | | | | | | | | | | | | |
| | Pup 14 | - | - | - | - | C | | | | | | | | | | | | | | | | | |

| | | |
|---|---|---|
| | Dead pup observations - individual observations<br>Preface | Appendix 18 |

**Pup necropsy observations:** $F_1$ pups found dead or euthanized during lactation were given a gross external and internal examination, including sex determination, when possible. Unusual observations and the absence of milk in the stomach (up to PND 4) were noted. For pups found dead on PND 0 to 1, lungs were examined for evidence of expansion. Severely autolytic or partially cannibalized pups were examined to the fullest extent possible and discarded.

**Key to Abbreviations:**

M = Male
F = Female
N = No
N/A = Not applicable
WNL = Within normal limits
Y = Yes
U = Unable to determine

| | Dead pup observations- individual observations | Appendix 18 |
|---|---|---|

| Dam Number | Pup Number | External Sex | Internal Sex | PND | Partially Cannibalized | Autolytic | Milk | Lungs Expanded | Observations |
|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | | | | |
| 1503 | 101 | F | U | 1 | N | Y | N | Y | WNL |
| 1506 | 101 | F | U | 1 | N | Y | N | U | Mal-rotated hind legs; tail absent; imperforate anus |
| 1507 | 101 | M | M | 1 | N | N | N | Y | WNL |
| 1507 | 102 | F | F | 1 | N | N | N | Y | WNL |
| 1507 | 103 | F | F | 1 | N | N | N | Y | WNL |
| 1507 | 104 | F | F | 1 | N | Y | N | Y | WNL |
| 1507 | 105 | F | F | 1 | N | N | N | Y | WNL |
| 1509 | 2 | M | M | 1 | N | N | N | Y | WNL |
| 1509 | 3 | M | M | 1 | N | N | N | Y | WNL |
| 1509 | 4 | M | F | 1 | N | N | N | Y | WNL |
| 1509 | 5 | M | M | 1 | N | N | N | Y | WNL |
| 1509 | 6 | M | M | 1 | N | N | N | Y | WNL |
| 1509 | 7 | M | M | 1 | N | N | N | N | WNL |
| 1509 | 8 | F | F | 1 | N | N | N | Y | WNL |
| 1509 | 9 | F | F | 1 | N | N | N | Y | WNL |
| 1509 | 10 | F | F | 1 | N | N | N | Y | WNL |
| 1509 | 11 | F | F | 1 | N | N | N | Y | WNL |
| 1509 | 12 | F | F | 1 | N | N | N | Y | WNL |
| 1509 | 13 | F | F | 1 | N | N | N | Y | WNL |
| 1509 | 14 | F | U | 1 | Y | Y | N | Y | Undetermined due to cannibalization |
| 1511 | 101 | F | F | 1 | N | Y | N | Y | WNL |
| 1512 | 2 | U | U | 16 | Y | Y | N/A | N/A | N/A |
| 1513 | 4 | F | F | 2 | Y | Y | N | N/A | WNL; Tail missing |

| | Dead pup observations- individual observations | Appendix 18 |
|---|---|---|

| Dam Number | Pup Number | External Sex | Internal Sex | PND | Partially Cannibalized | Autolytic | Milk | Lungs Expanded | Observations |
|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | | | | |
| 1513 | 5 | F | F | 2 | N | Y | N | N/A | WNL |
| 1513 | 6 | F | F | 2 | N | N | Y | N/A | WNL |
| 1513 | 10 | F | F | 1 | N | N | N | Y | WNL |
| 1513 | 101 | M | M | 1 | N | N | Y | Y | WNL |
| 1513 | 102 | M | M | 1 | N | N | Y | Y | WNL |
| 1513 | 103 | M | F | 1 | N | N | N | Y | WNL |
| 1513 | 104 | F | F | 1 | N | N | N | Y | WNL |
| 1513 | 105 | F | F | 1 | N | N | Y | Y | WNL |
| 1516 | 1 | M | M | 2 | N | Y | N | N/A | WNL |
| 1516 | 2 | M | M | 2 | N | Y | N | N/A | WNL |
| 1516 | 4 | M | M | 2 | N | Y | N | N/A | WNL |
| 1516 | 7 | M | M | 2 | N | Y | N | N/A | WNL |
| 1516 | 8 | F | F | 2 | N | Y | N | N/A | WNL |
| 1516 | 12 | F | F | 2 | N | Y | N | N/A | WNL |
| 1516 | 101 | M | M | 0 | N | N | N | Y | WNL |
| 1516 | 102 | F | F | 0 | N | N | N | Y | WNL |
| 1517 | 11 | F | F | 1 | N | Y[a] | Y | Y | WNL |
| 1517 | 101 | M | M | 1 | N | N | Y | Y | WNL |
| 1517 | 102 | F | F | 1 | N | N | Y | Y | WNL |
| 1519 | 12 | F | F | 1 | N | N | N | Y | WNL |

[a]Abdominal cavity only

| | Dead pup observations- individual observations | Appendix 18 |
|---|---|---|

| Dam Number | Pup Number | External Sex | Internal Sex | PND | Partially Cannibalized | Autolytic | Milk | Lungs Expanded | Observations |
|---|---|---|---|---|---|---|---|---|---|
| Group 1 - 0 mg/m$^3$ | | | | | | | | | |
| 1519 | 101 | F | F | 1 | N | N | N | Y | WNL |
| 1522 | 1 | M | N/A | 18 | N/A | N/A | N | N/A | Stomach gas distended, severe |
| 1522 | 3 | M | M | 18 | Y | Y | N/A | N/A | WNL |
| 1522 | 4 | U | U | 17 | Y | Y | N/A | N/A | Examined to most possible extent, due to cannibalization |
| 1522 | 5 | U | U | 17 | Y | Y | N/A | N/A | Examined to most possible extent, due to cannibalization |
| 1522 | 6 | F | F | 14 | N | N | N | N/A | WNL |
| 1522 | 7 | F | F | 18 | Y | Y | N/A | N/A | WNL |
| 1522 | 8 | F | F | 18 | Y | Y | N/A | N/A | WNL |
| 1522 | 9 | F | F | 2 | N | N | Y | N/A | WNL |
| 1522 | 10 | U | U | 17 | Y | Y | N/A | N/A | Examined to most possible extent, due to cannibalization |
| 1522 | 11 | U | U | 17 | Y | Y | N/A | N/A | Examined to most possible extent, due to cannibalization |
| 1525 | 101 | M | M | 1 | N | Y | N | Y | WNL |
| 1525 | 102 | M | M | 1 | N | Y | N | N | WNL |
| 1525 | 103 | F | F | 1 | N | Y | N | N | WNL |
| 1525 | 104 | M | U | 1 | Y | Y | U | U | WNL |
| 1525 | 105 | F | U | 1 | N | Y | N | U | WNL |
| 1526 | 13 | F | F | 10 | N | N | Y[a] | N/A | Tail missing, partially cannibalized |
| 1526 | 14 | M | M | 1 | N | N | Y | Y | WNL |
| 1526 | 101 | F | F | 1 | N | Y | N | Y | WNL; Tail missing |

[a]Food in stomach

| | Dead pup observations- individual observations | Appendix 18 |
|---|---|---|

| Dam Number | Pup Number | External Sex | Internal Sex | PND | Partially Cannibalized | Autolytic | Milk | Lungs Expanded | Observations |
|---|---|---|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | |
| 2502 | 101 | M | M | 0 | N | N | N | Y | WNL |
| 2502 | 102 | F | F | 0 | N | N | N | Y | WNL |
| 2502 | 103 | F | F | 0 | N | N | N | Y | WNL |
| 2504 | 11 | M | M | 4 | N | Y | U | N/A | WNL; Milk not determined due to abdominal autolysis |
| 2504 | 14 | F | F | 3 | N | N/A | Y | N/A | WNL |
| 2504 | 15 | F | F | 5 | N | Y | N | N/A | WNL |
| 2506 | 1 | M | M | 2 | N | Y | N | N/A | WNL |
| 2506 | 2 | M | M | 2 | N | Y | N | N/A | WNL |
| 2506 | 3 | M | M | 2 | N | Y | N | N/A | WNL |
| 2506 | 4 | M | M | 2 | N | Y | N | N/A | WNL |
| 2506 | 5 | M | M | 2 | N | Y | N | N/A | WNL |
| 2506 | 6 | F | F | 2 | N | Y | N | N/A | WNL |
| 2506 | 7 | F | F | 2 | N | Y | N | N/A | WNL |
| 2506 | 8 | F | F | 2 | N | Y | N | N/A | WNL |
| 2506 | 9 | F | F | 2 | N | Y | N | N/A | WNL |
| 2506 | 101 | M | M | 1 | N | Y | N | Y | WNL |
| 2506 | 102 | F | F | 1 | N | Y | N | Y | WNL |
| 2506 | 103 | F | F | 1 | N | Y | N | Y | WNL |
| 2506 | 104 | F | F | 1 | Y | Y | Y | N | WNL; Left cranial partly cannibalized |
| 2506 | 105 | F | F | 1 | N | Y | N | Y | WNL |
| 2506 | 106 | U | U | 1 | Y | U | U | U | Upper torso and lower torso cannibalized; sex could not be determined; head, thoracic cavity and hind limbs missing |
| 2507 | 101 | M | M | 0 | N | Y | N | Y | WNL |

| | Dead pup observations- individual observations | Appendix 18 |
|---|---|---|

| Dam Number | Pup Number | External Sex | Internal Sex | PND | Partially Cannibalized | Autolytic | Milk | Lungs Expanded | Observations |
|---|---|---|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | |
| 2509 | 101 | F | F | 0 | N | N | Y | Y | WNL |
| 2509 | 102 | F | F | 0 | N | N | Y | Y | WNL |
| 2509 | 103 | F | F | 0 | N | N | Y | Y | WNL |
| 2510 | 101 | F | F | 0 | N | Y | N | Y | WNL |
| 2512 | 12 | F | F | 1 | N | Y | Y | N/A | WNL |
| 2515 | 101 | F | F | 0 | N | N | M | Y | WNL |
| 2516 | 1 | M | U | 3 | N | Y | Y | N/A | WNL |
| 2516 | 2 | M | M | 3 | N | N | Y | N/A | WNL |
| 2516 | 3 | M | M | 3 | N | N | Y | N/A | WNL |
| 2516 | 4 | M | M | 3 | N | N | Y | N/A | WNL |
| 2516 | 6 | M | M | 3 | N | N | Y | N/A | WNL |
| 2516 | 9 | F | F | 3 | N | N | Y | N/A | WNL |
| 2516 | 101 | M | M | 1 | N | N | N | Y | WNL |
| 2516 | 102 | M | M | 1 | N | N | N | Y | WNL |
| 2516 | 103 | F | F | 1 | N | N | N | Y | WNL |
| 2516 | 104 | F | F | 1 | N | N | N | Y | WNL |
| 2518 | 13 | F | F | 11 | N | N | N | N/A | WNL |
| 2519 | 101 | F | F | 1 | N | N | Y | Y | WNL |
| 2522 | 9 | F | F | 2 | N | Y[a] | Y | N/A | WNL |
| 2522 | 15 | F | F | 1 | N | Y | N | Y | WNL |
| 2523 | 8 | M | M | 2 | N | Y | N | N/A | WNL |
| 2523 | 101 | M | M | 1 | N | N | Y | Y | WNL |
| 2523 | 102 | M | M | 1 | N | N | Y | Y | WNL |

[a]Abdominal cavity only

| | Dead pup observations- individual observations | Appendix 18 |
|---|---|---|

| Dam Number | Pup Number | External Sex | Internal Sex | PND | Partially Cannibalized | Autolytic | Milk | Lungs Expanded | Observations |
|---|---|---|---|---|---|---|---|---|---|
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | |
| 2523 | 103 | F | F | 1 | N | N | N | Y | WNL |
| 2526 | 1 | M | M | 2 | Y | Y | Y | N/A | WNL; No head present, cannibalized |
| 2526 | 4 | M | M | 2 | N | Y | Y | N/A | WNL |
| 2526 | 6 | M | M | 2 | N | Y | Y | N/A | WNL |
| 2526 | 101 | F | F | 1 | N | N | N | Y | WNL |
| 2526 | 102 | F | F | 1 | N | N | N | Y | WNL |

| | Dead pup observations- individual observations | Appendix 18 |
|---|---|---|

| Dam Number | Pup Number | External Sex | Internal Sex | PND | Partially Cannibalized | Autolytic | Milk | Lungs Expanded | Observations |
|---|---|---|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | |
| 3501 | 101 | F | F | 1 | N | N | Y | Y | WNL |
| 3504 | 2 | M | M | 2 | N | N | Y | N/A | WNL |
| 3504 | 3 | M | M | 2 | N | N | N | N/A | WNL |
| 3504 | 6 | M | M | 2 | N | N | Y | N/A | WNL |
| 3504 | 8 | M | M | 2 | N | N | Y | N/A | WNL; Scab on snout, red |
| 3504 | 101 | M | M | 1 | N | N | Y | Y | WNL |
| 3504 | 102 | M | M | 1 | N | N | Y | Y | WNL |
| 3504 | 103 | F | F | 1 | N | N | Y | Y | WNL |
| 3504 | 104 | F | F | 1 | N | N | Y | Y | WNL |
| 3505 | 101 | F | F | 0 | N | N | N | N | WNL |
| 3507 | 3 | M | M | 2 | N | N | Y | N/A | WNL |
| 3507 | 6 | F | F | 2 | N | Y | N | N/A | WNL |
| 3507 | 12 | F | F | 2 | N | N | Y | N/A | WNL |
| 3507 | 101 | M | M | 0 | N | N | Y | Y | WNL |
| 3507 | 102 | M | M | 0 | N | N | Y | N | WNL |
| 3507 | N/A | N/A | U | 2 | Y | N | N/A | N/A | Head only; pup number and external sex could not be determined |
| 3509 | 101 | F | F | 1 | Y | N | Y | Y | WNL; Tail missing |
| 3509 | 102 | F | F | 1 | N | N | Y | Y | WNL |
| 3512 | 14 | F | F | 4 | N | Y[a] | N | N/A | WNL |
| 3518 | 3 | M | U | 2 | N | Y | N | N/A | WNL |
| 3518 | 4 | M | U | 2 | N | Y | N | N/A | WNL |

[a]Abdominal cavity only

| | Dead pup observations- individual observations | Appendix 18 |
|---|---|---|

| Dam Number | Pup Number | External Sex | Internal Sex | PND | Partially Cannibalized | Autolytic | Milk | Lungs Expanded | Observations |
|---|---|---|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | |
| 3518 | 7 | M | U | 2 | N | Y | Y | N/A | WNL |
| 3518 | 10 | F | U | 2 | N | Y | N | N/A | WNL |
| 3518 | 13 | F | U | 2 | N | Y | N | N/A | WNL |
| 3518 | 101 | F | F | 1 | N | N | N | Y | WNL |
| 3518 | 102 | M | M | 1 | N | N | Y | Y | WNL |
| 3521 | 5 | F | F | 2 | Y | N | N | N/A | WNL; hind paws and portion of tail cannibalized |
| 3521 | 11 | F | F | 2 | N | N | Y | N/A | WNL |
| 3523 | 101 | F | F | 1 | N | N | Y | Y | WNL |

| | Dead pup observations- individual observations | Appendix 18 |
|---|---|---|

| Dam Number | Pup Number | External Sex | Internal Sex | PND | Partially Cannibalized | Autolytic | Milk | Lungs Expanded | Observations |
|---|---|---|---|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | |
| 4501 | 101 | F | F | 1 | N | N | N | Y | WNL |
| 4503 | 6 | F | U | 3 | N | Y[a] | N | N/A | WNL |
| 4503 | 15 | F | F | 1 | N | Y | N | Y | WNL |
| 4513 | 4 | M | U | 21 | Y | Y | N/A | N/A | |
| 4525 | 10 | M | M | 1 | N | Y | N | Y | WNL |
| 4525 | 11 | F | F | 1 | N | N | N | Y | WNL |
| 4525 | 12 | F | F | 1 | N | N | N | Y | WNL |
| 4525 | 13 | F | F | 1 | N | Y[a] | N | Y | WNL |
| 4525 | 101 | M | M | 0 | N | N | N | N | WNL |
| 4525 | 102 | M | M | 0 | N | N | N | Y | WNL |
| 4525 | 103 | F | F | 0 | N | N | N | Y | WNL |
| 4525 | 104 | M | M | 1 | N | Y | N | Y | WNL |
| 4525 | 105 | F | F | 1 | N | N | Y | Y | WNL |

[a]Abdominal cavity only

| Females | Pup body weight - individual values (grams) | Appendix 19 |
|---|---|---|

| Animal number | Day of age (before cull) | | | | | | Day of age (after cull) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | | | 4 | | | 4 | | | 7 | | | 14 | | | 21 | | |
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | | | | | | |
| 1501 | 4.8 | 0.46 | 15 | 6.5 | 0.82 | 15 | 6.5 | 0.49 | 10 | 9.9 | 0.78 | 10 | 20.1 | 1.16 | 10 | 33.9 | 1.55 | 10 |
| 1502 | 6.4 | 0.35 | 12 | 8.6 | 0.31 | 12 | 8.6 | 0.32 | 10 | 11.7 | 0.54 | 10 | 20.9 | 0.83 | 10 | 34.2 | 2.24 | 10 |
| 1503 | 6.6 | 0.70 | 11 | 9.1 | 0.96 | 11 | 9.3 | 0.93 | 10 | 12.1 | 1.15 | 10 | 21.4 | 1.80 | 10 | 37.2 | 2.60 | 10 |
| 1505 | 7.1 | 0.32 | 13 | 9.2 | 0.97 | 13 | 8.9 | 0.91 | 10 | 12.6 | 1.13 | 10 | 22.4 | 1.58 | 10 | 37.3 | 3.57 | 10 |
| 1506 | 7.4 | 0.45 | 10 | 9.1 | 0.37 | 10 | 9.1 | 0.37 | 10 | 12.1 | 0.61 | 10 | 21.8 | 0.78 | 10 | 37.7 | 1.86 | 10 |
| 1507 | 6.4 | 0.59 | 11 | 8.1 | 0.67 | 11 | 8.1 | 0.70 | 10 | 10.6 | 0.89 | 10 | 19.5 | 1.57 | 10 | 33.7 | 2.37 | 10 |
| 1508 | 6.1 | 0.70 | 13 | 8.3 | 1.07 | 13 | 8.6 | 0.63 | 10 | 12.5 | 0.90 | 10 | 24.1 | 1.24 | 10 | 39.1 | 2.10 | 10 |
| 1509 | 4.4 | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 1510 | 5.9 | 0.34 | 13 | 7.8 | 0.55 | 13 | 7.9 | 0.56 | 10 | 10.6 | 0.85 | 10 | 21.1 | 1.64 | 10 | 32.5 | 2.80 | 10 |
| 1511 | 6.5 | 0.32 | 15 | 7.6 | 0.34 | 15 | 7.6 | 0.34 | 10 | 10.9 | 0.46 | 9 | 20.2 | 0.93 | 10 | 33.1 | 1.62 | 10 |
| 1513 | 5.1 | 0.47 | 9 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 1514 | 7.3 | 0.84 | 10 | 10.2 | 1.41 | 10 | 10.2 | 1.41 | 10 | 13.9 | 2.57 | 10 | 27.3 | 2.03 | 9 | 49.6 | 3.32 | 9 |
| 1515 | 6.0 | 0.68 | 13 | 8.0 | 1.02 | 13 | 8.2 | 0.70 | 10 | 11.0 | 1.02 | 10 | 19.9 | 1.54 | 10 | 33.2 | 2.59 | 10 |
| 1516 | 5.9 | 0.29 | 12 | 7.2 | 0.35 | 2 | 7.2 | 0.35 | 2 | 8.8 | 0.99 | 2 | 18.4 | 2.19 | 2 | 34.0 | 2.47 | 2 |
| 1517 | 6.5 | 0.48 | 11 | 9.2 | 0.99 | 10 | 9.2 | 0.99 | 10 | 12.3 | 1.51 | 10 | 22.6 | 4.61 | 10 | 40.1 | 6.35 | 9 |
| 1518 | 6.4 | 0.56 | 15 | 8.4 | 0.59 | 14 | 8.5 | 0.57 | 10 | 11.7 | 0.93 | 10 | 22.8 | 1.27 | 10 | 41.9 | 2.25 | 10 |
| 1519 | 4.4 | 0.26 | 11 | 6.1 | 1.19 | 6 | 6.1 | 1.19 | 6 | 10.4 | 2.57 | 6 | 23.3 | 6.14 | 6 | 37.1 | 9.45 | 6 |
| 1520 | 5.7 | 0.25 | 12 | 8.1 | 0.34 | 12 | 8.1 | 0.36 | 10 | 11.3 | 0.39 | 10 | 21.5 | 0.84 | 10 | 36.6 | 1.66 | 10 |
| 1522 | 6.2 | 0.51 | 12 | 8.4 | 0.90 | 11 | 8.4 | 0.94 | 10 | 11.0 | 1.30 | 10 | 15.4 | 1.84 | 9 | - | - | - |
| 1523 | 6.6 | 0.36 | 13 | 8.4 | 0.43 | 13 | 8.2 | 0.38 | 10 | 11.7 | 0.60 | 10 | 21.7 | 1.20 | 10 | 34.8 | 3.29 | 10 |
| 1525 | 6.1 | 0.46 | 9 | 9.7 | 0.91 | 9 | 9.7 | 0.91 | 9 | 13.5 | 1.29 | 9 | 24.4 | 2.39 | 9 | 42.2 | 4.27 | 9 |
| 1526 | 4.8 | 0.29 | 13 | 6.6 | 1.12 | 9 | 6.6 | 1.12 | 9 | 8.9 | 1.78 | 9 | 20.7 | 4.68 | 8 | 34.9 | 7.07 | 8 |

| Females | Pup body weight - individual values (grams) | Appendix 19 |
|---|---|---|

| Animal Number | Day of age (before cull) | | | | | | Day of age (after cull) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | | | 4 | | | 4 | | | 7 | | | 14 | | | 21 | | |
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | |
| 2501 | 6.2 | 0.37 | 14 | 8.3 | 0.40 | 13 | 8.2 | 0.38 | 10 | 10.9 | 0.61 | 10 | 20.8 | 0.90 | 10 | 32.8 | 1.76 | 10 |
| 2502 | 6.2 | 0.34 | 12 | 8.7 | 0.40 | 12 | 8.8 | 0.45 | 10 | 12.6 | 0.62 | 10 | 24.4 | 1.01 | 10 | 41.7 | 1.30 | 10 |
| 2503 | 7.4 | 0.55 | 9 | 10.9 | 0.61 | 9 | 10.9 | 0.61 | 9 | 13.4 | 0.80 | 9 | 23.0 | 1.06 | 9 | 39.2 | 2.17 | 9 |
| 2504 | 7.0 | 0.45 | 15 | 9.0 | 0.94 | 12 | 8.9 | 1.00 | 10 | 13.1 | 0.61 | 9 | 25.1 | 0.97 | 9 | 44.8 | 2.73 | 9 |
| 2506 | 5.2 | 0.34 | 9 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2507 | 4.9 | 0.37 | 14 | 6.7 | 0.62 | 14 | 6.7 | 0.62 | 14 | 10.1 | 0.99 | 10 | 22.1 | 1.45 | 10 | 36.8 | 2.78 | 10 |
| 2509 | 10.5 | 15.89 | 12 | 8.1 | 0.64 | 9 | 8.1 | 0.64 | 9 | 11.5 | 0.84 | 9 | 24.1 | 1.36 | 9 | 38.9 | 2.81 | 9 |
| 2510 | 7.5 | 0.76 | 12 | 10.3 | 0.89 | 12 | 10.5 | 0.39 | 10 | 14.0 | 0.65 | 10 | 23.9 | 0.92 | 10 | 38.7 | 1.55 | 10 |
| 2512 | 6.3 | 0.49 | 13 | 9.7 | 1.23 | 9 | 9.7 | 1.23 | 9 | 26.4 | 40.77 | 9 | 22.9 | 2.69 | 9 | 37.0 | 4.34 | 9 |
| 2513 | 6.3 | 0.70 | 12 | 7.8 | 0.64 | 12 | 7.8 | 0.62 | 10 | 10.6 | 0.68 | 10 | 20.5 | 0.79 | 10 | 31.4 | 1.37 | 10 |
| 2514 | 6.4 | 0.37 | 12 | 8.4 | 0.48 | 12 | 8.5 | 0.43 | 10 | 11.2 | 0.61 | 10 | 21.6 | 1.26 | 10 | 32.6 | 1.09 | 10 |
| 2515 | 6.7 | 0.56 | 13 | 8.8 | 0.52 | 13 | 9.0 | 0.46 | 10 | 12.7 | 0.43 | 10 | 23.2 | 0.66 | 10 | 37.7 | 1.18 | 10 |
| 2516 | 6.1 | 0.27 | 10 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2517 | 6.3 | 0.29 | 14 | 7.8 | 0.26 | 14 | 7.7 | 0.26 | 10 | 11.0 | 0.41 | 10 | 22.0 | 1.02 | 10 | 35.4 | 1.84 | 10 |
| 2518 | 6.4 | 0.52 | 13 | 8.5 | 0.73 | 11 | 8.7 | 0.39 | 10 | 11.4 | 0.68 | 10 | 22.7 | 0.98 | 9 | 39.2 | 1.53 | 9 |
| 2519 | 6.9 | 0.42 | 9 | 8.9 | 0.52 | 9 | 8.9 | 0.52 | 9 | 10.7 | 0.51 | 9 | 21.6 | 1.36 | 9 | 37.6 | 2.91 | 9 |
| 2520 | 6.1 | 0.34 | 13 | 9.4 | 0.83 | 9 | 9.4 | 0.83 | 9 | 12.7 | 1.05 | 9 | 22.3 | 1.84 | 9 | 35.5 | 4.14 | 9 |
| 2521 | 5.8 | 0.23 | 13 | 7.9 | 0.44 | 13 | 8.0 | 0.36 | 10 | 11.5 | 0.54 | 10 | 21.3 | 1.57 | 10 | 35.1 | 3.46 | 10 |
| 2522 | 6.0 | 0.42 | 15 | 8.0 | 0.75 | 13 | 8.2 | 0.55 | 10 | 11.0 | 0.69 | 10 | 21.3 | 0.94 | 10 | 37.4 | 2.02 | 10 |
| 2523 | 5.3 | 0.40 | 10 | 6.8 | 0.61 | 9 | 6.8 | 0.61 | 9 | 9.7 | 0.75 | 9 | 19.7 | 1.83 | 9 | 32.4 | 2.36 | 9 |
| 2524 | 7.8 | 0.51 | 11 | 11.0 | 0.51 | 10 | 11.0 | 0.51 | 10 | 13.9 | 0.64 | 10 | 25.1 | 1.10 | 10 | 43.0 | 2.12 | 10 |
| 2526 | 5.5 | 0.45 | 12 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

| Females | Pup body weight - individual values (grams) | Appendix 19 |
|---|---|---|

| Animal Number | Day of age (before cull) | | | | | | Day of age (after cull) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | | | 4 | | | 4 | | | 7 | | | 14 | | | 21 | | |
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | |
| 3501 | 6.9 | 0.52 | 12 | 9.5 | 0.58 | 12 | 9.5 | 0.63 | 10 | 12.0 | 0.77 | 10 | 21.7 | 1.19 | 10 | 34.1 | 2.04 | 10 |
| 3503 | 6.7 | 0.49 | 13 | 8.2 | 0.69 | 13 | 8.2 | 0.78 | 10 | 10.4 | 1.19 | 10 | 18.4 | 2.20 | 10 | 32.4 | 4.28 | 10 |
| 3504 | 5.7 | 0.32 | 10 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 3505 | 7.5 | 0.40 | 12 | 9.2 | 0.40 | 12 | 9.2 | 0.42 | 10 | 11.8 | 0.52 | 10 | 22.5 | 1.50 | 10 | 37.8 | 2.56 | 10 |
| 3506 | 7.3 | 0.37 | 12 | 9.6 | 0.38 | 12 | 9.7 | 0.38 | 10 | 13.0 | 0.59 | 10 | 23.6 | 1.05 | 10 | 39.5 | 1.91 | 10 |
| 3507 | 5.3 | 0.35 | 14 | 6.6 | 0.76 | 5 | 6.6 | 0.76 | 5 | 8.5 | 1.51 | 5 | 21.2 | 0.47 | 3 | 34.8 | 1.21 | 3 |
| 3508 | 5.8 | 0.45 | 13 | 7.8 | 0.55 | 13 | 7.6 | 0.55 | 10 | 10.9 | 0.86 | 10 | 20.3 | 1.41 | 10 | 36.0 | 2.58 | 10 |
| 3509 | 6.4 | 0.35 | 12 | 8.6 | 0.57 | 12 | 8.7 | 0.60 | 10 | 11.7 | 0.71 | 10 | 22.0 | 0.82 | 10 | 38.2 | 1.48 | 10 |
| 3510 | 5.8 | 0.57 | 11 | 7.3 | 1.95 | 11 | 7.6 | 1.76 | 10 | 10.4 | 2.81 | 10 | 20.9 | 4.70 | 9 | 33.2 | 6.37 | 9 |
| 3511 | 8.0 | 0.50 | 6 | 10.8 | 0.76 | 6 | 10.8 | 0.76 | 6 | 14.2 | 1.04 | 6 | 24.5 | 1.57 | 6 | 40.4 | 2.74 | 6 |
| 3512 | 7.3 | 1.01 | 15 | 9.3 | 1.20 | 14 | 9.3 | 1.16 | 10 | 12.4 | 1.39 | 10 | 23.9 | 2.09 | 10 | 39.8 | 4.18 | 10 |
| 3513 | 7.0 | 0.73 | 11 | 9.4 | 1.16 | 11 | 9.5 | 1.15 | 10 | 13.2 | 1.57 | 10 | 25.6 | 1.45 | 10 | 40.6 | 3.97 | 10 |
| 3514 | 8.3 | 0.75 | 8 | 12.8 | 1.01 | 8 | 12.8 | 1.01 | 8 | 16.6 | 1.13 | 8 | 28.0 | 1.72 | 8 | 46.9 | 3.86 | 8 |
| 3515 | 6.9 | 0.37 | 9 | 9.3 | 0.77 | 9 | 9.3 | 0.77 | 9 | 11.9 | 1.05 | 9 | 21.2 | 1.71 | 9 | 34.3 | 2.68 | 9 |
| 3516 | 6.6 | 0.49 | 14 | 9.0 | 0.67 | 14 | 9.1 | 0.63 | 10 | 13.2 | 0.96 | 10 | 26.1 | 1.78 | 10 | 43.4 | 2.44 | 10 |
| 3518 | 4.9 | 0.47 | 14 | 5.3 | - | 1 | 5.3 | - | 1 | 5.7 | - | 1 | 7.5 | - | 1 | 8.4 | - | 1 |
| 3520 | 6.4 | 0.43 | 15 | 8.3 | 0.82 | 15 | 8.3 | 0.67 | 10 | 12.0 | 0.85 | 10 | 22.9 | 1.69 | 10 | 37.1 | 3.59 | 10 |
| 3521 | 5.1 | 0.22 | 12 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 3522 | 5.7 | 0.36 | 15 | 7.3 | 0.52 | 15 | 7.4 | 0.56 | 10 | 10.6 | 0.77 | 10 | 21.3 | 1.22 | 10 | 36.0 | 2.12 | 10 |
| 3523 | 6.2 | 0.50 | 13 | 9.2 | 0.79 | 11 | 9.3 | 0.75 | 10 | 12.0 | 0.89 | 10 | 23.1 | 1.34 | 10 | 38.9 | 2.58 | 10 |
| 3525 | 7.6 | 0.53 | 11 | 10.4 | 0.81 | 11 | 10.5 | 0.84 | 10 | 13.3 | 0.92 | 10 | 23.6 | 1.27 | 10 | 38.0 | 3.02 | 10 |
| 3526 | 6.3 | 0.38 | 11 | 9.3 | 0.50 | 11 | 9.3 | 0.50 | 10 | 12.1 | 0.57 | 10 | 22.0 | 1.00 | 10 | 33.9 | 1.73 | 10 |

| Females | Pup body weight - individual values (grams) | Appendix 19 |
|---|---|---|

| Animal Number | Day of age (before cull) | | | | | | Day of age (after cull) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | | | 4 | | | 4 | | | 7 | | | 14 | | | 21 | | |
| | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N | Mean | SD | N |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | |
| 4501 | 5.5 | 0.36 | 16 | 7.4 | 0.51 | 15 | 7.6 | 0.48 | 10 | 11.0 | 0.77 | 10 | 22.1 | 1.54 | 10 | 37.9 | 2.58 | 10 |
| 4502 | 7.9 | 0.36 | 9 | 11.2 | 0.48 | 9 | 11.2 | 0.48 | 9 | 14.0 | 0.66 | 9 | 24.5 | 1.27 | 9 | 40.6 | 2.12 | 9 |
| 4503 | 5.3 | 0.43 | 14 | 8.0 | 1.68 | 8 | 8.0 | 1.68 | 8 | 11.0 | 2.32 | 8 | 22.4 | 4.37 | 8 | 37.4 | 7.81 | 8 |
| 4504 | 7.8 | 0.43 | 11 | 10.4 | 0.56 | 11 | 10.4 | 0.58 | 10 | 13.5 | 0.90 | 10 | 22.7 | 1.08 | 10 | 38.6 | 2.06 | 10 |
| 4505 | 6.4 | 0.39 | 14 | 9.1 | 0.66 | 14 | 9.1 | 0.77 | 10 | 13.1 | 1.00 | 10 | 25.5 | 1.36 | 10 | 44.2 | 2.69 | 10 |
| 4509 | 7.1 | 0.62 | 14 | 9.2 | 0.89 | 14 | 9.5 | 0.78 | 10 | 12.6 | 0.92 | 10 | 22.8 | 1.29 | 10 | 41.1 | 2.77 | 10 |
| 4510 | 7.8 | 0.34 | 13 | 10.5 | 0.41 | 13 | 10.5 | 0.46 | 10 | 14.0 | 0.51 | 10 | 25.4 | 0.96 | 10 | 41.9 | 1.92 | 10 |
| 4512 | 6.7 | 0.38 | 12 | 9.9 | 0.54 | 11 | 10.0 | 0.53 | 10 | 13.3 | 0.75 | 10 | 22.8 | 1.19 | 10 | 37.8 | 2.94 | 10 |
| 4513 | 6.0 | 0.32 | 14 | 8.2 | 0.50 | 14 | 8.1 | 0.58 | 10 | 11.3 | 0.75 | 10 | 22.1 | 1.07 | 10 | 35.9 | 1.95 | 9 |
| 4515 | 7.9 | 0.46 | 13 | 10.0 | 0.90 | 13 | 10.1 | 0.93 | 10 | 14.6 | 0.82 | 9 | 25.8 | 1.12 | 9 | 42.6 | 2.03 | 9 |
| 4516 | 6.2 | 0.28 | 14 | 8.1 | 0.55 | 14 | 8.3 | 0.34 | 10 | 11.8 | 0.74 | 10 | 23.0 | 1.59 | 10 | 38.9 | 2.59 | 10 |
| 4517 | 6.0 | 0.41 | 13 | 8.6 | 0.58 | 13 | 8.7 | 0.60 | 10 | 12.5 | 1.65 | 10 | 23.3 | 1.19 | 10 | 39.4 | 2.55 | 10 |
| 4518 | 7.7 | 0.40 | 12 | 10.2 | 0.39 | 12 | 10.3 | 0.42 | 10 | 13.4 | 0.60 | 10 | 25.1 | 1.15 | 10 | 44.6 | 2.49 | 10 |
| 4521 | 6.1 | 0.39 | 13 | 7.9 | 0.61 | 13 | 7.9 | 0.58 | 10 | 10.9 | 0.87 | 10 | 21.1 | 1.70 | 10 | 36.6 | 3.22 | 10 |
| 4522 | 7.0 | 0.29 | 15 | 8.8 | 0.34 | 15 | 8.9 | 0.32 | 10 | 11.8 | 0.45 | 10 | 22.9 | 0.51 | 10 | 38.4 | 1.40 | 10 |
| 4523 | 5.7 | 0.58 | 14 | 7.4 | 0.74 | 14 | 7.6 | 0.69 | 10 | 10.7 | 0.94 | 10 | 20.7 | 1.49 | 10 | 32.8 | 1.99 | 10 |
| 4524 | 7.4 | 0.62 | 11 | 10.4 | 0.69 | 10 | 10.4 | 0.69 | 10 | 12.9 | 1.04 | 10 | 22.7 | 1.97 | 10 | 38.9 | 3.06 | 10 |
| 4525 | 4.8 | 0.14 | 9 | 6.0 | 0.68 | 8 | 6.0 | 0.68 | 8 | 9.9 | 0.58 | 7 | 21.2 | 1.12 | 7 | 38.0 | 2.07 | 7 |
| 4526 | 6.4 | 0.25 | 14 | 8.1 | 0.50 | 14 | 8.0 | 0.51 | 10 | 10.9 | 0.60 | 10 | 19.6 | 1.05 | 10 | 30.6 | 1.95 | 10 |

| | Parental macropathology - individual findings | Appendix 20 |
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| Animal number | Sex | Group/ Subgroup | Date and time data was entered | Date data taken | Opr # | Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels |
|---|---|---|---|---|---|---|
| 1001 | M | 1/1 | 06-Jul-15 11:12 | 06-Jul-15 | 46 | Within Normal Limits |
| 1002 | M | 1/1 | 06-Jul-15 11:25 | 06-Jul-15 | 427 | Within Normal Limits |
| 1003 | M | 1/1 | 06-Jul-15 12:42 | 06-Jul-15 | 471 | Within Normal Limits |
| 1004 | M | 1/1 | 06-Jul-15 12:54 | 06-Jul-15 | 427 | Within Normal Limits |
| 1005 | M | 1/1 | 06-Jul-15 15:46 | 06-Jul-15 | 471 | Within Normal Limits |
| 1006 | M | 1/1 | 06-Jul-15 16:08 | 06-Jul-15 | 427 | Within Normal Limits |
| 1007 | M | 1/1 | 06-Jul-15 16:42 | 06-Jul-15 | 471 | Within Normal Limits |
| 1008 | M | 1/1 | | | | Skin (other) |
| | | | 06-Jul-15 17:21 | 06-Jul-15 | 470 | Scab, Head, Red, , 0.2 - 0.5 cm, Multiple<br>Right side of head, with hair thin/absent, moderate. |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 06-Jul-15 17:48 | 06-Jul-15 | 470 | Adrenal Glands, Brain, Epididymides, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Pharynx, Pituitary, Prostate, Seminal Vesicles, Spleen, Testes, Trachea |
| 1009 | M | 1/1 | 08-Jul-15 10:27 | 08-Jul-15 | 427 | Within Normal Limits |
| 1010 | M | 1/1 | 08-Jul-15 12:02 | 08-Jul-15 | 461 | Within Normal Limits |
| 1011 | M | 1/1 | 08-Jul-15 12:07 | 08-Jul-15 | 427 | Within Normal Limits |
| 1012 | M | 1/1 | 08-Jul-15 13:15 | 08-Jul-15 | 471 | Within Normal Limits |
| 1013 | M | 1/1 | 08-Jul-15 14:43 | 08-Jul-15 | 461 | Within Normal Limits |
| 1014 | M | 1/1 | 08-Jul-15 15:21 | 08-Jul-15 | 461 | Within Normal Limits |
| 1015 | M | 1/1 | 08-Jul-15 15:37 | 08-Jul-15 | 46 | Within Normal Limits |
| 1016 | M | 1/1 | 08-Jul-15 15:52 | 08-Jul-15 | 471 | Within Normal Limits |
| 1017 | M | 1/1 | 08-Jul-15 16:52 | 08-Jul-15 | 222 | Within Normal Limits |
| 1018 | M | 1/1 | 08-Jul-15 16:47 | 08-Jul-15 | 46 | Within Normal Limits |

| | Parental macropathology - individual findings | Appendix 20 |
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| Animal number | Sex | Group/ Subgroup | Date and time data was entered | Date data taken | Opr # | Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels |
|---|---|---|---|---|---|---|
| 1019 | M | 1/1 | | | | Lungs |
| | | | 08-Jul-15 17:07 | 08-Jul-15 | 395 | Discolored, Left lobe(s), Red, Foci, </= 0.1 cm, Multiple Moderate |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 08-Jul-15 17:16 | 08-Jul-15 | 395 | Adrenal Glands, Brain, Epididymides, Kidneys, Larynx, Liver, Nasopharynx, Pharynx, Pituitary, Prostate, Seminal Vesicles, Spleen, Testes, Trachea |
| 1020 | M | 1/1 | 08-Jul-15 17:42 | 08-Jul-15 | 471 | Within Normal Limits |
| 1021 | M | 1/1 | 08-Jul-15 18:35 | 08-Jul-15 | 461 | Within Normal Limits |
| 1022 | M | 1/1 | 09-Jul-15 09:59 | 09-Jul-15 | 471 | Within Normal Limits |
| 1023 | M | 1/1 | 09-Jul-15 10:37 | 09-Jul-15 | 471 | Within Normal Limits |
| 1024 | M | 1/1 | | | | Tissues marked 'Within Normal Limits': |
| | | | 09-Jul-15 11:05 | 09-Jul-15 | 427 | Adrenal Glands, Brain, Epididymides, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Pharynx, Pituitary, Prostate, Seminal Vesicles, Spleen, Testes, Trachea |
| 1025 | M | 1/1 | 09-Jul-15 11:51 | 09-Jul-15 | 46 | Within Normal Limits |
| 1026 | M | 1/1 | 09-Jul-15 12:36 | 09-Jul-15 | 471 | Within Normal Limits |
| 2001 | M | 2/1 | 06-Jul-15 11:55 | 06-Jul-15 | 471 | Within Normal Limits |
| 2002 | M | 2/1 | 06-Jul-15 12:26 | 06-Jul-15 | 427 | Within Normal Limits |
| 2003 | M | 2/1 | | | | Thymus |
| | | | 06-Jul-15 13:01 | 06-Jul-15 | 470 | Discolored, Bilateral lobes, Red, Foci, </= 0.1 cm, Moderate |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 06-Jul-15 13:26 | 06-Jul-15 | 470 | Adrenal Glands, Brain, Epididymides, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Pharynx, Pituitary, Prostate, Seminal Vesicles, Spleen, Testes, Trachea |
| 2004 | M | 2/1 | | | | Lungs |
| | | | 06-Jul-15 16:10 | 06-Jul-15 | 470 | Discolored, Left lobe(s), Red, Foci, </= 0.1 cm, Moderate |
| | | | 06-Jul-15 16:11 | 06-Jul-15 | 470 | Discolored, Right cardiac lobe, Red, Foci, </= 0.1 cm, Moderate |
| | | | 06-Jul-15 16:11 | 06-Jul-15 | 470 | Discolored, Right diaphragmatic lobe, Red, Foci, </= 0.1 cm, Moderate |

| | Parental macropathology - individual findings | Appendix 20 |
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| Animal number | Sex | Group/ Subgroup | Date and time data was entered | Date data taken | Opr # | Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels |
|---|---|---|---|---|---|---|
| 2004 | M | 2/1 | | | | Lungs |
| | | | 06-Jul-15 16:12 | 06-Jul-15 | 470 | Discolored, Accessory lobe, Red, Foci, </= 0.1 cm, Moderate |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 06-Jul-15 16:39 | 06-Jul-15 | 470 | Adrenal Glands, Brain, Epididymides, Kidneys, Larynx, Liver, Nasopharynx, Pharynx, Pituitary, Prostate, Seminal Vesicles, Spleen, Testes, Trachea |
| 2005 | M | 2/1 | 06-Jul-15 16:40 | 06-Jul-15 | 395 | Within Normal Limits |
| 2006 | M | 2/1 | 06-Jul-15 17:00 | 06-Jul-15 | 427 | Within Normal Limits |
| 2007 | M | 2/1 | 06-Jul-15 17:14 | 06-Jul-15 | 395 | Within Normal Limits |
| 2008 | M | 2/1 | 06-Jul-15 17:36 | 06-Jul-15 | 46 | Within Normal Limits |
| 2009 | M | 2/1 | 08-Jul-15 11:27 | 08-Jul-15 | 46 | Within Normal Limits |
| 2010 | M | 2/1 | 08-Jul-15 12:12 | 08-Jul-15 | 471 | Within Normal Limits |
| 2011 | M | 2/1 | 08-Jul-15 12:40 | 08-Jul-15 | 427 | Within Normal Limits |
| 2012 | M | 2/1 | | | | Epididymides |
| | | | 08-Jul-15 14:12 | 08-Jul-15 | 459 | Soft, Left, , , , Moderate |
| | | | | | | Testes |
| | | | 08-Jul-15 14:13 | 08-Jul-15 | 459 | Soft, Left, , , , Moderate |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 08-Jul-15 14:15 | 08-Jul-15 | 459 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Pharynx, Pituitary, Prostate, Seminal Vesicles, Spleen, Trachea |
| 2013 | M | 2/1 | 08-Jul-15 15:02 | 08-Jul-15 | 46 | Within Normal Limits |
| 2014 | M | 2/1 | | | | Kidneys |
| | | | 08-Jul-15 15:31 | 08-Jul-15 | 222 | Cyst, Right, Clear, Fluid, 0.6 - 0.9 cm, |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 08-Jul-15 15:38 | 08-Jul-15 | 222 | Adrenal Glands, Brain, Epididymides, Larynx, Liver, Lungs, Nasopharynx, Pharynx, Pituitary, Prostate, Seminal Vesicles, Spleen, Testes, Trachea |
| 2015 | M | 2/1 | 08-Jul-15 15:49 | 08-Jul-15 | 395 | Within Normal Limits |

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|---|---|---|---|---|---|---|
| 2016 | M | 2/1 | 08-Jul-15 16:18 | 08-Jul-15 | 459 | Within Normal Limits |
| 2017 | M | 2/1 | 08-Jul-15 16:27 | 08-Jul-15 | 427 | Within Normal Limits |
| 2018 | M | 2/1 | 08-Jul-15 17:08 | 08-Jul-15 | 471 | Within Normal Limits |
| 2019 | M | 2/1 | 08-Jul-15 18:05 | 08-Jul-15 | 395 | Within Normal Limits |
| 2020 | M | 2/1 | 08-Jul-15 18:13 | 08-Jul-15 | 427 | Within Normal Limits |
| 2021 | M | 2/1 | 08-Jul-15 18:45 | 08-Jul-15 | 395 | Within Normal Limits |
| 2022 | M | 2/1 | 09-Jul-15 10:39 | 09-Jul-15 | 46 | Within Normal Limits |
| 2023 | M | 2/1 | 09-Jul-15 11:08 | 09-Jul-15 | 471 | Within Normal Limits |
| 2024 | M | 2/1 | 09-Jul-15 11:38 | 09-Jul-15 | 427 | Within Normal Limits |
| 2025 | M | 2/1 | 09-Jul-15 12:20 | 09-Jul-15 | 46 | Within Normal Limits |
| 2026 | M | 2/1 | 09-Jul-15 13:19 | 09-Jul-15 | 471 | Within Normal Limits |
| 3001 | M | 3/1 | 05-Aug-15 10:03 | 06-Jul-15 | 337 | Within Normal Limits |
| 3002 | M | 3/1 | 24-Apr-15 09:28 | 24-Apr-15 | 460 | Within Normal Limits |
| 3003 | M | 3/1 | 06-Jul-15 12:14 | 06-Jul-15 | 46 | Within Normal Limits |
| 3004 | M | 3/1 | 06-Jul-15 13:21 | 06-Jul-15 | 471 | Within Normal Limits |
| 3005 | M | 3/1 | 06-Jul-15 13:24 | 06-Jul-15 | 427 | Within Normal Limits |
| 3006 | M | 3/1 | 06-Jul-15 15:51 | 06-Jul-15 | 46 | Within Normal Limits |
| 3007 | M | 3/1 | 06-Jul-15 17:09 | 06-Jul-15 | 46 | Within Normal Limits |
| 3008 | M | 3/1 | 06-Jul-15 17:15 | 06-Jul-15 | 471 | Within Normal Limits |
| 3009 | M | 3/1 | 08-Jul-15 11:16 | 08-Jul-15 | 427 | Within Normal Limits |
| 3010 | M | 3/1 | 08-Jul-15 11:51 | 08-Jul-15 | 46 | Within Normal Limits |
| 3011 | M | 3/1 | 08-Jul-15 12:43 | 08-Jul-15 | 471 | Within Normal Limits |

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|---|---|---|---|---|---|---|
| 3012 | M | 3/1 | 08-Jul-15 13:54 | 08-Jul-15 | 471 | Within Normal Limits |
| 3013 | M | 3/1 | 08-Jul-15 14:57 | 08-Jul-15 | 459 | Within Normal Limits |
| 3014 | M | 3/1 | 08-Jul-15 15:21 | 08-Jul-15 | 471 | Within Normal Limits |
| 3015 | M | 3/1 | 08-Jul-15 15:37 | 08-Jul-15 | 427 | Within Normal Limits |
| 3016 | M | 3/1 | | | | Lungs |
| | | | 08-Jul-15 16:26 | 08-Jul-15 | 461 | Discolored, Right lobes, Pale, Foci, 0.2 - 0.5 cm, Slight |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 08-Jul-15 16:27 | 08-Jul-15 | 461 | Adrenal Glands, Brain, Epididymides, Kidneys, Larynx, Liver, Nasopharynx, Pharynx, Pituitary, Prostate, Seminal Vesicles, Spleen, Testes, Trachea |
| 3017 | M | 3/1 | 08-Jul-15 16:28 | 08-Jul-15 | 471 | Within Normal Limits |
| 3018 | M | 3/1 | | | | Thymus |
| | | | 08-Jul-15 17:18 | 08-Jul-15 | 461 | Discolored, Bilateral lobes, Red, Foci, 0.2 - 0.5 cm, Moderate |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 08-Jul-15 17:20 | 08-Jul-15 | 461 | Adrenal Glands, Brain, Epididymides, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Pharynx, Pituitary, Prostate, Seminal Vesicles, Spleen, Testes, Trachea |
| 3019 | M | 3/1 | 08-Jul-15 17:19 | 08-Jul-15 | 461 | Within Normal Limits |
| 3020 | M | 3/1 | 08-Jul-15 18:11 | 08-Jul-15 | 471 | Within Normal Limits |
| 3021 | M | 3/1 | 08-Jul-15 18:35 | 08-Jul-15 | 471 | Within Normal Limits |
| 3022 | M | 3/1 | 09-Jul-15 10:07 | 09-Jul-15 | 427 | Within Normal Limits |
| 3023 | M | 3/1 | 09-Jul-15 10:57 | 09-Jul-15 | 46 | Within Normal Limits |
| 3024 | M | 3/1 | 09-Jul-15 11:34 | 09-Jul-15 | 471 | Within Normal Limits |
| 3025 | M | 3/1 | 09-Jul-15 12:05 | 09-Jul-15 | 427 | Within Normal Limits |
| 3026 | M | 3/1 | 09-Jul-15 12:49 | 09-Jul-15 | 46 | Within Normal Limits |
| 4001 | M | 4/1 | 06-Jul-15 11:46 | 06-Jul-15 | 395 | Within Normal Limits |

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|---|---|---|---|---|---|---|
| 4002 | M | 4/1 | 06-Jul-15 11:57 | 06-Jul-15 | 427 | Within Normal Limits |
| 4003 | M | 4/1 | 06-Jul-15 12:43 | 06-Jul-15 | 46 | Within Normal Limits |
| 4004 | M | 4/1 | 06-Jul-15 13:26 | 06-Jul-15 | 46 | Within Normal Limits |
| 4005 | M | 4/1 | 06-Jul-15 15:40 | 06-Jul-15 | 427 | Within Normal Limits |
| 4006 | M | 4/1 | 06-Jul-15 16:18 | 06-Jul-15 | 46 | Within Normal Limits |
| 4007 | M | 4/1 | 06-Jul-15 16:33 | 06-Jul-15 | 427 | Within Normal Limits |
| 4008 | M | 4/1 | 06-Jul-15 17:27 | 06-Jul-15 | 427 | Within Normal Limits |
| 4009 | M | 4/1 | 08-Jul-15 10:54 | 08-Jul-15 | 46 | Within Normal Limits |
| 4010 | M | 4/1 | 08-Jul-15 11:43 | 08-Jul-15 | 427 | Within Normal Limits |
| 4011 | M | 4/1 | 06-Aug-15 09:32 | 08-Jul-15 | 46 | Within Normal Limits |
| 4012 | M | 4/1 | 08-Jul-15 12:44 | 08-Jul-15 | 461 | Within Normal Limits |
| 4013 | M | 4/1 | 08-Jul-15 14:52 | 08-Jul-15 | 395 | Within Normal Limits |
| 4014 | M | 4/1 | 08-Jul-15 15:32 | 08-Jul-15 | 395 | Within Normal Limits |
| 4015 | M | 4/1 | | | | Lungs |
| | | | 08-Jul-15 15:37 | 08-Jul-15 | 459 | Cyst, Left lobe(s), Clear, , 0.2 - 0.5 cm, |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 08-Jul-15 15:40 | 08-Jul-15 | 459 | Adrenal Glands, Brain, Epididymides, Kidneys, Larynx, Liver, Nasopharynx, Pharynx, Pituitary, Prostate, Seminal Vesicles, Spleen, Testes, Trachea |
| 4016 | M | 4/1 | 08-Jul-15 16:02 | 08-Jul-15 | 46 | Within Normal Limits |
| 4017 | M | 4/1 | 08-Jul-15 16:36 | 08-Jul-15 | 395 | Within Normal Limits |
| 4018 | M | 4/1 | 08-Jul-15 16:53 | 08-Jul-15 | 459 | Within Normal Limits |
| 4019 | M | 4/1 | 08-Jul-15 17:20 | 08-Jul-15 | 46 | Within Normal Limits |
| 4020 | M | 4/1 | 08-Jul-15 18:00 | 08-Jul-15 | 461 | Within Normal Limits |

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|---|---|---|---|---|---|---|
| 4021 | M | 4/1 | 08-Jul-15 18:29 | 08-Jul-15 | 46 | Within Normal Limits |
| 4022 | M | 4/1 | 09-Jul-15 10:06 | 09-Jul-15 | 46 | Within Normal Limits |
| 4023 | M | 4/1 | 09-Jul-15 10:38 | 09-Jul-15 | 427 | Within Normal Limits |
| 4024 | M | 4/1 | 09-Jul-15 11:21 | 09-Jul-15 | 46 | Within Normal Limits |
| 4025 | M | 4/1 | 09-Jul-15 12:03 | 09-Jul-15 | 471 | Within Normal Limits |
| 4026 | M | 4/1 | 09-Jul-15 12:42 | 09-Jul-15 | 427 | Within Normal Limits |
| 1501 | F | 1/1 | | | | Uterus w/ Cervix |
| | | | 11-Jul-15 09:25 | 11-Jul-15 | 427 | Implantation scars, , , , , |
| | | | | | | Right=10 |
| | | | | | | Left=5 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 11-Jul-15 09:43 | 11-Jul-15 | 427 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 1502 | F | 1/1 | | | | Uterus w/ Cervix |
| | | | 09-Jul-15 12:23 | 09-Jul-15 | 461 | Implantation scars, , , , , |
| | | | | | | Right= 9 |
| | | | | | | Left= 3 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 09-Jul-15 12:23 | 09-Jul-15 | 461 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 1503 | F | 1/1 | | | | Uterus w/ Cervix |
| | | | 10-Jul-15 09:05 | 10-Jul-15 | 461 | Implantation scars, , , , , |
| | | | | | | Right= 7 |
| | | | | | | Left= 6 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 10-Jul-15 09:23 | 10-Jul-15 | 461 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 1504 | F | 1/1 | 23-Jun-15 16:50 | 23-Jun-15 | 250 | Within Normal Limits |

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|---|---|---|---|---|---|---|
| 1505 | F | 1/1 | | | | Uterus w/ Cervix |
| | | | 10-Jul-15 09:38 | 10-Jul-15 | 471 | Implantation scars, , , , , |
| | | | | | | Right 5 |
| | | | | | | Left 9 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 10-Jul-15 09:38 | 10-Jul-15 | 471 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 1506 | F | 1/1 | | | | Uterus w/ Cervix |
| | | | 12-Jul-15 09:08 | 12-Jul-15 | 459 | Implantation scars, , , , , |
| | | | | | | Right = 3 |
| | | | | | | Left = 10 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 12-Jul-15 09:26 | 12-Jul-15 | 459 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 1507 | F | 1/1 | | | | Uterus w/ Cervix |
| | | | 13-Jul-15 19:01 | 13-Jul-15 | 470 | Implantation scars, , , , , |
| | | | | | | Left = 9, Right= 7. |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 13-Jul-15 19:21 | 13-Jul-15 | 470 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 1508 | F | 1/1 | | | | Uterus w/ Cervix |
| | | | 10-Jul-15 09:54 | 10-Jul-15 | 222 | Implantation scars, , , , , |
| | | | | | | Left horn= 6, Right horn= 6 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 10-Jul-15 09:54 | 10-Jul-15 | 222 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 1509 | F | 1/1 | | | | Uterus w/ Cervix |
| | | | 17-Sep-15 13:27 | 20-Jun-15 | 459 | Implantation scars, , , , , |
| | | | | | | Right horn = 8 |
| | | | | | | Left horn = 8 |

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|---|---|---|---|---|---|---|
| 1509 | F | 1/1 | | | | Tissues marked 'Within Normal Limits': |
| | | | 17-Sep-15 13:27 | 20-Jun-15 | 459 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 1510 | F | 1/1 | | | | Uterus w/ Cervix |
| | | | 10-Jul-15 09:48 | 10-Jul-15 | 470 | Implantation scars, , , , , Right side = 9, Left side = 5. |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 10-Jul-15 10:26 | 10-Jul-15 | 470 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 1511 | F | 1/1 | | | | Uterus w/ Cervix |
| | | | 13-Jul-15 20:01 | 13-Jul-15 | 427 | Implantation scars, , , , , Right=6, Left=9 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 13-Jul-15 20:07 | 13-Jul-15 | 427 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 1512 | F | 1/1 | 23-Jun-15 16:51 | 23-Jun-15 | 427 | Within Normal Limits |
| 1513 | F | 1/1 | | | | Uterus w/ Cervix |
| | | | 17-Sep-15 13:33 | 20-Jun-15 | 459 | Implantation scars, , , , , Right horn = 8, Left horn = 7 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 17-Sep-15 13:33 | 20-Jun-15 | 459 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 1514 | F | 1/1 | | | | Muscle (other) |
| | | | 13-Jul-15 20:12 | 13-Jul-15 | 395 | Mass(es), Right Forelimb, Tan, Firm, 2.0 - 2.9 cm, |
| | | | | | | Uterus w/ Cervix |
| | | | 13-Jul-15 20:07 | 13-Jul-15 | 395 | Implantation scars, , , , , Right=8, Left=6 |

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|---|---|---|---|---|---|---|
| 1514 | F | 1/1 | | | | Tissues marked 'Within Normal Limits': |
| | | | 13-Jul-15 20:22 | 13-Jul-15 | 395 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 1515 | F | 1/1 | | | | Uterus w/ Cervix |
| | | | 11-Jul-15 09:26 | 11-Jul-15 | 461 | Implantation scars, , , , , Right= 9 Left= 5 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 11-Jul-15 09:38 | 11-Jul-15 | 461 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 1516 | F | 1/1 | | | | Pituitary |
| | | | 11-Jul-15 09:41 | 11-Jul-15 | 222 | Small, , , , , Moderate |
| | | | | | | Uterus w/ Cervix |
| | | | 11-Jul-15 09:29 | 11-Jul-15 | 222 | Implantation scars, , , , , Left horn= 6, Right horn= 6 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 11-Jul-15 09:41 | 11-Jul-15 | 222 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Spleen, Trachea, Vagina |
| 1517 | F | 1/1 | | | | Uterus w/ Cervix |
| | | | 10-Jul-15 11:11 | 10-Jul-15 | 427 | Implantation scars, , , , , Right=8 Left=5 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 10-Jul-15 11:20 | 10-Jul-15 | 427 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 1518 | F | 1/1 | | | | Uterus w/ Cervix |
| | | | 11-Jul-15 10:46 | 11-Jul-15 | 222 | Implantation scars, , , , , Left=7 Right=8 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 11-Jul-15 11:00 | 11-Jul-15 | 222 | Adrenal Glands, Brain, Kidneys, Larynx |

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|---|---|---|---|---|---|---|
| 1518 | F | 1/1 | 11-Jul-15 11:00 | 11-Jul-15 | 222 | Tissues marked 'Within Normal Limits':<br>Liver, Lungs, Nasopharynx, Ovaries<br>Pharynx, Pituitary, Spleen, Trachea<br>Vagina |
| 1519 | F | 1/1 | | | | Uterus w/ Cervix |
| | | | 10-Jul-15 11:43 | 10-Jul-15 | 461 | Implantation scars, , , , ,<br>Right= 10<br>Left= 5 |
| | | | | | | Tissues marked 'Within Normal Limits':<br>Adrenal Glands, Brain, Kidneys, Larynx<br>Liver, Lungs, Nasopharynx, Ovaries<br>Pharynx, Pituitary, Spleen, Trachea<br>Vagina |
| | | | 10-Jul-15 12:04 | 10-Jul-15 | 461 | |
| 1520 | F | 1/1 | | | | Uterus w/ Cervix |
| | | | 12-Jul-15 09:36 | 12-Jul-15 | 46 | Implantation scars, , , , ,<br>Right=9<br>Left=5 |
| | | | | | | Tissues marked 'Within Normal Limits':<br>Adrenal Glands, Brain, Kidneys, Larynx<br>Liver, Lungs, Nasopharynx, Ovaries<br>Pharynx, Pituitary, Spleen, Trachea<br>Vagina |
| | | | 12-Jul-15 09:41 | 12-Jul-15 | 46 | |
| 1521 | F | 1/1 | 22-Jun-15 11:54 | 22-Jun-15 | 427 | Within Normal Limits |
| 1522 | F | 1/1 | | | | Uterus w/ Cervix |
| | | | 07-Jul-15 17:52 | 07-Jul-15 | 222 | Implantation scars, , , , ,<br>Right horn has 10 scars, Left horn has 4 scars. |
| | | | | | | Tissues marked 'Within Normal Limits':<br>Adrenal Glands, Brain, General Comments, Kidneys<br>Larynx, Liver, Lungs, Nasopharynx<br>Ovaries, Pharynx, Pituitary, Spleen<br>Trachea, Vagina |
| | | | 07-Jul-15 18:06 | 07-Jul-15 | 222 | |
| 1523 | F | 1/1 | | | | Pituitary |
| | | | 01-Sep-15 12:22 | 09-Jul-15 | 250 | Enlarged, , , , , Severe |
| | | | | | | Uterus w/ Cervix |
| | | | 09-Jul-15 15:06 | 09-Jul-15 | 427 | Implantation scars, , , , ,<br>Right = 5<br>Left = 9 |

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|---|---|---|---|---|---|---|
| 1523 | F | 1/1 | | | | Tissues marked 'Within Normal Limits': |
| | | | 09-Jul-15 15:20 | 09-Jul-15 | 250 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Spleen, Trachea, Vagina |
| 1524 | F | 1/1 | 07-Jul-15 12:35 | 21-Jun-15 | 337 | Within Normal Limits |
| 1525 | F | 1/1 | | | | Uterus w/ Cervix |
| | | | 12-Jul-15 10:38 | 12-Jul-15 | 46 | Implantation scars, , , , , Right=12 Left=3 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 12-Jul-15 10:43 | 12-Jul-15 | 46 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 1526 | F | 1/1 | | | | Uterus w/ Cervix |
| | | | 11-Jul-15 10:45 | 11-Jul-15 | 427 | Implantation scars, , , , , Right=7 Left=8 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 11-Jul-15 10:56 | 11-Jul-15 | 427 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 2501 | F | 2/1 | | | | Uterus w/ Cervix |
| | | | 09-Jul-15 14:07 | 09-Jul-15 | 427 | Implantation scars, , , , , Right = 10 Left = 4 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 09-Jul-15 14:24 | 09-Jul-15 | 427 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 2502 | F | 2/1 | | | | Uterus w/ Cervix |
| | | | 13-Jul-15 21:00 | 13-Jul-15 | 395 | Implantation scars, , , , , Right=10,Left=5 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 13-Jul-15 21:11 | 13-Jul-15 | 395 | Adrenal Glands, Brain, Kidneys, Larynx |

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|---|---|---|---|---|---|---|
| 2502 | F | 2/1 | 13-Jul-15 21:11 | 13-Jul-15 | 395 | Tissues marked 'Within Normal Limits': |
| | | | | | | Liver / Lungs / Nasopharynx / Ovaries |
| | | | | | | Pharynx / Pituitary / Spleen / Trachea |
| | | | | | | Vagina |
| 2503 | F | 2/1 | | | | Uterus w/ Cervix |
| | | | 10-Jul-15 11:21 | 10-Jul-15 | 471 | Implantation scars, , , , , |
| | | | | | | Left=4 |
| | | | | | | Right=4 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 10-Jul-15 11:21 | 10-Jul-15 | 471 | Adrenal Glands / Brain / Kidneys / Larynx |
| | | | | | | Liver / Lungs / Nasopharynx / Ovaries |
| | | | | | | Pharynx / Pituitary / Spleen / Trachea |
| | | | | | | Vagina |
| 2504 | F | 2/1 | | | | Uterus w/ Cervix |
| | | | 14-Jul-15 10:02 | 14-Jul-15 | 471 | Implantation scars, , , , , |
| | | | | | | Left=9 |
| | | | | | | Right=9 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 14-Jul-15 10:14 | 14-Jul-15 | 471 | Adrenal Glands / Brain / Kidneys / Larynx |
| | | | | | | Liver / Lungs / Nasopharynx / Ovaries |
| | | | | | | Pharynx / Pituitary / Spleen / Trachea |
| | | | | | | Vagina |
| 2505 | F | 2/1 | 21-Jun-15 10:56 | 21-Jun-15 | 337 | Within Normal Limits |
| 2506 | F | 2/1 | | | | Lungs |
| | | | 21-Jun-15 18:52 | 21-Jun-15 | 337 | Discolored, Left lobe(s), Black, Area, 0.2 - 0.5 cm, |
| | | | | | | Uterus w/ Cervix |
| | | | 21-Jun-15 18:37 | 21-Jun-15 | 337 | Implantation scars, , , , , |
| | | | | | | 7 on right horn; 9 on left horn. |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 21-Jun-15 18:58 | 21-Jun-15 | 337 | Adrenal Glands / Brain / Kidneys / Larynx |
| | | | | | | Liver / Nasopharynx / Ovaries / Pharynx |
| | | | | | | Pituitary / Spleen / Trachea / Vagina |
| 2507 | F | 2/1 | | | | Uterus w/ Cervix |
| | | | 13-Jul-15 20:52 | 13-Jul-15 | 427 | Implantation scars, , , , , |
| | | | | | | Right=8 |
| | | | | | | Left=11 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 13-Jul-15 20:58 | 13-Jul-15 | 427 | Adrenal Glands / Brain / Kidneys / Larynx |

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|---|---|---|---|---|---|---|
| 2507 | F | 2/1 | 13-Jul-15 20:58 | 13-Jul-15 | 427 | Tissues marked 'Within Normal Limits':<br>Liver / Lungs / Nasopharynx / Ovaries<br>Pharynx / Pituitary / Spleen / Trachea<br>Vagina |
| 2508 | F | 2/1 | 23-Jun-15 16:35 | 23-Jun-15 | 250 | Within Normal Limits |
| 2509 | F | 2/1 | | | | Uterus w/ Cervix |
| | | | 12-Jul-15 10:17 | 12-Jul-15 | 46 | Implantation scars, , , , ,<br>Right=6<br>Left=10 |
| | | | | | | Tissues marked 'Within Normal Limits':<br>Adrenal Glands / Brain / Kidneys / Larynx<br>Liver / Lungs / Nasopharynx / Ovaries<br>Pharynx / Pituitary / Spleen / Trachea<br>Vagina |
| | | | 12-Jul-15 10:26 | 12-Jul-15 | 46 | |
| 2510 | F | 2/1 | | | | Uterus w/ Cervix |
| | | | 13-Jul-15 21:10 | 13-Jul-15 | 470 | Implantation scars, , , , ,<br>Left = 7, Right = 8. |
| | | | | | | Tissues marked 'Within Normal Limits':<br>Adrenal Glands / Brain / Kidneys / Larynx<br>Liver / Lungs / Nasopharynx / Ovaries<br>Pharynx / Pituitary / Spleen / Trachea<br>Vagina |
| | | | 13-Jul-15 21:30 | 13-Jul-15 | 470 | |
| 2511 | F | 2/1 | 21-Jun-15 11:45 | 21-Jun-15 | 337 | Within Normal Limits |
| 2512 | F | 2/1 | | | | Uterus w/ Cervix |
| | | | 09-Jul-15 14:40 | 09-Jul-15 | 427 | Implantation scars, , , , ,<br>Right = 10<br>Left = 3 |
| | | | | | | Tissues marked 'Within Normal Limits':<br>Adrenal Glands / Brain / Kidneys / Larynx<br>Liver / Lungs / Nasopharynx / Ovaries<br>Pharynx / Pituitary / Spleen / Trachea<br>Vagina |
| | | | 09-Jul-15 14:48 | 09-Jul-15 | 427 | |
| 2513 | F | 2/1 | | | | Uterus w/ Cervix |
| | | | 12-Jul-15 10:37 | 12-Jul-15 | 459 | Implantation scars, , , , ,<br>Right= 9<br>Left= 4 |

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|---|---|---|---|---|---|---|
| 2513 | F | 2/1 | | | | Tissues marked 'Within Normal Limits': |
| | | | 12-Jul-15 10:52 | 12-Jul-15 | 459 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 2514 | F | 2/1 | | | | Uterus w/ Cervix |
| | | | 12-Jul-15 11:19 | 12-Jul-15 | 459 | Implantation scars, , , , , Right = 2, Left =11 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 12-Jul-15 11:36 | 12-Jul-15 | 459 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 2515 | F | 2/1 | | | | Uterus w/ Cervix |
| | | | 10-Jul-15 11:07 | 10-Jul-15 | 461 | Implantation scars, , , , , Right= 11, Left= 5 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 10-Jul-15 11:21 | 10-Jul-15 | 461 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 2516 | F | 2/1 | | | | Uterus w/ Cervix |
| | | | 23-Jun-15 17:23 | 23-Jun-15 | 250 | Implantation scars, , , , , Right horn-7, Left horn-8 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 23-Jun-15 17:30 | 23-Jun-15 | 250 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 2517 | F | 2/1 | | | | Uterus w/ Cervix |
| | | | 11-Jul-15 10:46 | 11-Jul-15 | 461 | Implantation scars, , , , , Right= 11, Left= 5 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 11-Jul-15 10:46 | 11-Jul-15 | 461 | Adrenal Glands, Brain, Kidneys, Larynx |

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|---|---|---|---|---|---|---|
| 2517 | F | 2/1 | 11-Jul-15 10:46 | 11-Jul-15 | 461 | Tissues marked 'Within Normal Limits':<br>Liver, Lungs, Nasopharynx, Ovaries<br>Pharynx, Pituitary, Spleen, Trachea<br>Vagina |
| 2518 | F | 2/1 | | | | Ileum |
| | | | 10-Jul-15 11:52 | 10-Jul-15 | 222 | Diverticulum, Proximal, , , 0.6 - 0.9 cm, |
| | | | | | | Uterus w/ Cervix |
| | | | 10-Jul-15 11:39 | 10-Jul-15 | 222 | Implantation scars, , , , ,<br>Left horn= 7, Right horn= 8 |
| | | | | | | Tissues marked 'Within Normal Limits':<br>Adrenal Glands, Brain, Kidneys, Larynx<br>Liver, Lungs, Nasopharynx, Ovaries<br>Pharynx, Pituitary, Spleen, Trachea<br>Vagina |
| | | | 10-Jul-15 12:08 | 10-Jul-15 | 222 | |
| 2519 | F | 2/1 | | | | Uterus w/ Cervix |
| | | | 10-Jul-15 11:53 | 10-Jul-15 | 471 | Implantation scars, , , , ,<br>Right=8<br>Left=3 |
| | | | | | | Tissues marked 'Within Normal Limits':<br>Adrenal Glands, Brain, Kidneys, Larynx<br>Liver, Lungs, Nasopharynx, Ovaries<br>Pharynx, Pituitary, Spleen, Trachea<br>Vagina |
| | | | 10-Jul-15 12:05 | 10-Jul-15 | 471 | |
| 2520 | F | 2/1 | | | | Uterus w/ Cervix |
| | | | 09-Jul-15 15:02 | 09-Jul-15 | 461 | Implantation scars, , , , ,<br>Right= 5<br>Left= 7 |
| | | | | | | Tissues marked 'Within Normal Limits':<br>Adrenal Glands, Brain, Kidneys, Larynx<br>Liver, Lungs, Nasopharynx, Ovaries<br>Pharynx, Pituitary, Spleen, Trachea<br>Vagina |
| | | | 09-Jul-15 15:02 | 09-Jul-15 | 461 | |
| 2521 | F | 2/1 | | | | Uterus w/ Cervix |
| | | | 10-Jul-15 12:19 | 10-Jul-15 | 427 | Implantation scars, , , , ,<br>Right=7<br>Left=7 |
| | | | | | | Tissues marked 'Within Normal Limits':<br>Adrenal Glands, Brain, Kidneys, Larynx |
| | | | 10-Jul-15 12:37 | 10-Jul-15 | 427 | |

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|---|---|---|---|---|---|---|
| 2521 | F | 2/1 | 10-Jul-15 12:37 | 10-Jul-15 | 427 | Tissues marked 'Within Normal Limits':<br>Liver / Lungs / Nasopharynx / Ovaries<br>Pharynx / Pituitary / Spleen / Trachea<br>Vagina |
| 2522 | F | 2/1 | | | | Uterus w/ Cervix |
| | | | 12-Jul-15 11:21 | 12-Jul-15 | 46 | Implantation scars, , , , ,<br>Right=5<br>Left=11 |
| | | | | | | Tissues marked 'Within Normal Limits':<br>Adrenal Glands / Brain / Kidneys / Larynx<br>Liver / Lungs / Nasopharynx / Ovaries<br>Pharynx / Pituitary / Spleen / Trachea<br>Vagina |
| | | | 12-Jul-15 11:23 | 12-Jul-15 | 46 | |
| 2523 | F | 2/1 | | | | Uterus w/ Cervix |
| | | | 10-Jul-15 12:37 | 10-Jul-15 | 471 | Implantation scars, , , , ,<br>Left=6<br>Right=7 |
| | | | | | | Tissues marked 'Within Normal Limits':<br>Adrenal Glands / Brain / Kidneys / Larynx<br>Liver / Lungs / Nasopharynx / Ovaries<br>Pharynx / Pituitary / Spleen / Trachea<br>Vagina |
| | | | 10-Jul-15 12:50 | 10-Jul-15 | 471 | |
| 2524 | F | 2/1 | | | | Uterus w/ Cervix |
| | | | 10-Jul-15 12:43 | 10-Jul-15 | 461 | Implantation scars, , , , ,<br>Right= 5<br>Left= 10 |
| | | | | | | Tissues marked 'Within Normal Limits':<br>Adrenal Glands / Brain / Kidneys / Larynx<br>Liver / Lungs / Nasopharynx / Ovaries<br>Pharynx / Pituitary / Spleen / Trachea<br>Vagina |
| | | | 10-Jul-15 12:44 | 10-Jul-15 | 461 | |
| 2525 | F | 2/1 | 21-Jun-15 12:26 | 21-Jun-15 | 337 | Within Normal Limits |
| 2526 | F | 2/1 | | | | Uterus w/ Cervix |
| | | | 23-Jun-15 17:22 | 23-Jun-15 | 427 | Implantation scars, , , , ,<br>8 on right horn<br>7 on left horn |
| | | | | | | Tissues marked 'Within Normal Limits':<br>Adrenal Glands / Brain / Kidneys / Larynx |
| | | | 23-Jun-15 17:31 | 23-Jun-15 | 427 | |

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|---|---|---|---|---|---|---|
| 2526 | F | 2/1 | 23-Jun-15 17:31 | 23-Jun-15 | 427 | Tissues marked 'Within Normal Limits':<br>Liver, Lungs, Nasopharynx, Ovaries<br>Pharynx, Pituitary, Spleen, Trachea<br>Vagina |
| 3501 | F | 3/1 | | | | Jejunum |
| | | | 10-Jul-15 10:40 | 10-Jul-15 | 471 | Diverticulum, , , , 1.0 - 1.5 cm,<br>Filled with tan material. |
| | | | | | | Uterus w/ Cervix |
| | | | 10-Jul-15 10:49 | 10-Jul-15 | 471 | Implantation scars, , , , ,<br>Left=8<br>Right=7 |
| | | | 10-Jul-15 10:49 | 10-Jul-15 | 471 | Tissues marked 'Within Normal Limits':<br>Adrenal Glands, Brain, Kidneys, Larynx<br>Liver, Lungs, Nasopharynx, Ovaries<br>Pharynx, Pituitary, Spleen, Trachea<br>Vagina |
| 3502 | F | 3/1 | 23-Jun-15 16:31 | 23-Jun-15 | 427 | Within Normal Limits |
| 3503 | F | 3/1 | | | | Uterus w/ Cervix |
| | | | 13-Jul-15 20:32 | 13-Jul-15 | 470 | Implantation scars, , , , ,<br>Left = 3, Right = 10. |
| | | | 13-Jul-15 20:58 | 13-Jul-15 | 470 | Tissues marked 'Within Normal Limits':<br>Adrenal Glands, Brain, Kidneys, Larynx<br>Liver, Lungs, Nasopharynx, Ovaries<br>Pharynx, Pituitary, Spleen, Trachea<br>Vagina |
| 3504 | F | 3/1 | | | | Uterus w/ Cervix |
| | | | 21-Jun-15 18:01 | 21-Jun-15 | 337 | Implantation scars, , , , ,<br>10 on right horn; 5 on left horn. |
| | | | 21-Jun-15 18:13 | 21-Jun-15 | 337 | Tissues marked 'Within Normal Limits':<br>Adrenal Glands, Brain, Kidneys, Larynx<br>Liver, Lungs, Nasopharynx, Ovaries<br>Pharynx, Pituitary, Spleen, Trachea<br>Vagina |
| 3505 | F | 3/1 | | | | Uterus w/ Cervix |
| | | | 11-Jul-15 10:21 | 11-Jul-15 | 461 | Implantation scars, , , , ,<br>Right= 10<br>Left= 7 |

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|---|---|---|---|---|---|---|---|---|---|
| 3505 | F | 3/1 | | | | Tissues marked 'Within Normal Limits': | | | |
| | | | 11-Jul-15 10:30 | 11-Jul-15 | 461 | Adrenal Glands | Brain | Kidneys | Larynx |
| | | | | | | Liver | Lungs | Nasopharynx | Ovaries |
| | | | | | | Pharynx | Pituitary | Spleen | Trachea |
| | | | | | | Vagina | | | |
| 3506 | F | 3/1 | | | | Uterus w/ Cervix | | | |
| | | | 13-Jul-15 20:34 | 13-Jul-15 | 427 | Implantation scars, , , , , | | | |
| | | | | | | Right= 10 | | | |
| | | | | | | Left=7 | | | |
| | | | | | | Tissues marked 'Within Normal Limits': | | | |
| | | | 13-Jul-15 20:40 | 13-Jul-15 | 427 | Adrenal Glands | Brain | Kidneys | Larynx |
| | | | | | | Liver | Lungs | Nasopharynx | Ovaries |
| | | | | | | Pharynx | Pituitary | Spleen | Trachea |
| | | | | | | Vagina | | | |
| 3507 | F | 3/1 | | | | Uterus w/ Cervix | | | |
| | | | 11-Jul-15 10:26 | 11-Jul-15 | 222 | Implantation scars, , , , , | | | |
| | | | | | | Left horn=7, Right horn=7 | | | |
| | | | | | | Tissues marked 'Within Normal Limits': | | | |
| | | | 11-Jul-15 10:38 | 11-Jul-15 | 222 | Adrenal Glands | Brain | Kidneys | Larynx |
| | | | | | | Liver | Lungs | Nasopharynx | Ovaries |
| | | | | | | Pharynx | Pituitary | Spleen | Trachea |
| | | | | | | Vagina | | | |
| 3508 | F | 3/1 | | | | Uterus w/ Cervix | | | |
| | | | 09-Jul-15 13:32 | 09-Jul-15 | 427 | Implantation scars, , , , , | | | |
| | | | | | | Right = 8 | | | |
| | | | | | | Left = 3 | | | |
| | | | | | | Tissues marked 'Within Normal Limits': | | | |
| | | | 09-Jul-15 13:46 | 09-Jul-15 | 427 | Adrenal Glands | Brain | Kidneys | Larynx |
| | | | | | | Liver | Lungs | Nasopharynx | Ovaries |
| | | | | | | Pharynx | Pituitary | Spleen | Trachea |
| | | | | | | Vagina | | | |
| 3509 | F | 3/1 | | | | Uterus w/ Cervix | | | |
| | | | 11-Jul-15 10:24 | 11-Jul-15 | 427 | Implantation scars, , , , , | | | |
| | | | | | | Right=8 | | | |
| | | | | | | Left=6 | | | |
| | | | | | | Tissues marked 'Within Normal Limits': | | | |
| | | | 11-Jul-15 10:34 | 11-Jul-15 | 427 | Adrenal Glands | Brain | Kidneys | Larynx |
| | | | | | | Liver | Lungs | Nasopharynx | Ovaries |

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|---|---|---|---|---|---|---|
| 3509 | F | 3/1 | 11-Jul-15 10:34 | 11-Jul-15 | 427 | Tissues marked 'Within Normal Limits':<br>Pharynx Pituitary Spleen Trachea<br>Vagina |
| 3510 | F | 3/1 | | | | Uterus w/ Cervix |
| | | | 09-Jul-15 13:49 | 09-Jul-15 | 461 | Implantation scars, , , , ,<br>Right= 5<br>Left= 8 |
| | | | | | | Tissues marked 'Within Normal Limits':<br>Adrenal Glands Brain Kidneys Larynx<br>Liver Lungs Nasopharynx Ovaries<br>Pharynx Pituitary Spleen Trachea<br>Vagina |
| 3511 | F | 3/1 | | | | Uterus w/ Cervix |
| | | | 11-Jul-15 11:15 | 11-Jul-15 | 427 | Implantation scars, , , , ,<br>Right=6<br>Left=6 |
| | | | | | | Tissues marked 'Within Normal Limits':<br>Adrenal Glands Brain Kidneys Larynx<br>Liver Lungs Nasopharynx Ovaries<br>Pharynx Pituitary Spleen Trachea<br>Vagina |
| 3512 | F | 3/1 | | | | Uterus w/ Cervix |
| | | | 10-Jul-15 10:55 | 10-Jul-15 | 222 | Implantation scars, , , , ,<br>Right horn= 7, Left horn = 9 |
| | | | | | | Tissues marked 'Within Normal Limits':<br>Adrenal Glands Brain Kidneys Larynx<br>Liver Lungs Nasopharynx Ovaries<br>Pharynx Pituitary Spleen Trachea<br>Vagina |
| 3513 | F | 3/1 | | | | Uterus w/ Cervix |
| | | | 13-Jul-15 20:43 | 13-Jul-15 | 461 | Implantation scars, , , , ,<br>Right= 7<br>Left= 6 |
| | | | | | | Tissues marked 'Within Normal Limits':<br>Adrenal Glands Brain Kidneys Larynx<br>Liver Lungs Nasopharynx Ovaries<br>Pharynx Pituitary Spleen Trachea<br>Vagina |

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|---|---|---|---|---|---|---|
| 3514 | F | 3/1 | | | | Uterus w/ Cervix |
| | | | 10-Jul-15 11:49 | 10-Jul-15 | 470 | Implantation scars, , , , , Right= 7, Left= 1. |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 10-Jul-15 12:15 | 10-Jul-15 | 470 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 3515 | F | 3/1 | | | | Thymus |
| | | | 13-Jul-15 21:21 | 13-Jul-15 | 461 | Small, Bilateral lobes, , , , Severe |
| | | | | | | Uterus w/ Cervix |
| | | | 13-Jul-15 21:19 | 13-Jul-15 | 461 | Implantation scars, , , , , Right= 1 Left= 9 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 13-Jul-15 21:38 | 13-Jul-15 | 461 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 3516 | F | 3/1 | | | | Uterus w/ Cervix |
| | | | 13-Jul-15 21:16 | 13-Jul-15 | 395 | Implantation scars, , , , , Right=9, Left=6 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 13-Jul-15 21:29 | 13-Jul-15 | 395 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 3517 | F | 3/1 | | | | Uterus w/ Cervix |
| | | | 11-Jul-15 11:49 | 11-Jul-15 | 427 | Implantation scars, , , , , Non-pregnant status verified as per salewski's staining. |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 11-Jul-15 11:56 | 11-Jul-15 | 427 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 3518 | F | 3/1 | | | | Uterus w/ Cervix |
| | | | 13-Jul-15 21:18 | 13-Jul-15 | 427 | Implantation scars, , , , , Right=10 Left=6 |

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|---|---|---|---|---|---|---|
| 3518 | F | 3/1 | | | | Tissues marked 'Within Normal Limits': |
| | | | 13-Jul-15 21:26 | 13-Jul-15 | 427 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 3519 | F | 3/1 | 22-Jun-15 12:20 | 22-Jun-15 | 427 | Within Normal Limits |
| 3520 | F | 3/1 | | | | Uterus w/ Cervix |
| | | | 12-Jul-15 10:15 | 12-Jul-15 | 459 | Implantation scars, , , , , Right= 8 Left= 9 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 12-Jul-15 10:31 | 12-Jul-15 | 459 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 3521 | F | 3/1 | | | | Uterus w/ Cervix |
| | | | 14-Jan-16 12:44 | 22-Jun-15 | 250 | Implantation scars, Right horn=7, , Left horn=8, , Total implantation scars 15 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 22-Jun-15 17:03 | 22-Jun-15 | 250 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 3522 | F | 3/1 | | | | Uterus w/ Cervix |
| | | | 15-Jul-15 11:59 | 15-Jul-15 | 461 | Implantation scars, , , , , Right= 8 Left= 6 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 15-Jul-15 11:59 | 15-Jul-15 | 461 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 3523 | F | 3/1 | | | | Uterus w/ Cervix |
| | | | 10-Jul-15 11:50 | 10-Jul-15 | 427 | Implantation scars, , , , , Right=10 Left=5 |

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|---|---|---|---|---|---|---|
| 3523 | F | 3/1 | | | | Tissues marked 'Within Normal Limits': |
| | | | 10-Jul-15 12:05 | 10-Jul-15 | 427 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 3524 | F | 3/1 | 21-Jun-15 14:29 | 21-Jun-15 | 337 | Within Normal Limits |
| 3525 | F | 3/1 | | | | Uterus w/ Cervix |
| | | | 13-Jul-15 21:31 | 13-Jul-15 | 427 | Implantation scars, , , , , Right=7 Left=7 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 13-Jul-15 21:38 | 13-Jul-15 | 427 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 3526 | F | 3/1 | | | | Uterus w/ Cervix |
| | | | 10-Jul-15 10:33 | 10-Jul-15 | 461 | Implantation scars, , , , , Right= 8 Left= |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 10-Jul-15 10:47 | 10-Jul-15 | 461 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 4501 | F | 4/1 | | | | Uterus w/ Cervix |
| | | | 11-Jul-15 10:01 | 11-Jul-15 | 461 | Implantation scars, , , , , Right= 11 Left= 7 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 11-Jul-15 10:01 | 11-Jul-15 | 461 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 4502 | F | 4/1 | | | | Uterus w/ Cervix |
| | | | 13-Jul-15 19:47 | 13-Jul-15 | 470 | Implantation scars, , , , , Left = 4, Right = 7. |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 13-Jul-15 20:08 | 13-Jul-15 | 470 | Adrenal Glands, Brain, Kidneys, Larynx |

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|---|---|---|---|---|---|---|
| 4502 | F | 4/1 | 13-Jul-15 20:08 | 13-Jul-15 | 470 | Tissues marked 'Within Normal Limits': Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 4503 | F | 4/1 | | | | Uterus w/ Cervix |
| | | | 12-Jul-15 09:42 | 12-Jul-15 | 459 | Implantation scars, , , , , Right=8 Left=8 |
| | | | 12-Jul-15 10:00 | 12-Jul-15 | 459 | Tissues marked 'Within Normal Limits': Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 4504 | F | 4/1 | | | | Stomach |
| | | | 11-Jul-15 09:53 | 11-Jul-15 | 427 | Abnormal Contents, Non-glandular mucosa, Red, Material, , Severe Thick. |
| | | | | | | Uterus w/ Cervix |
| | | | 11-Jul-15 09:50 | 11-Jul-15 | 427 | Implantation scars, , , , , Right=7 Left=7 |
| | | | 11-Jul-15 10:04 | 11-Jul-15 | 427 | Tissues marked 'Within Normal Limits': Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 4505 | F | 4/1 | | | | Uterus w/ Cervix |
| | | | 13-Jul-15 20:16 | 13-Jul-15 | 427 | Implantation scars, , , , , Right=9 Left=8 |
| | | | 13-Jul-15 20:24 | 13-Jul-15 | 427 | Tissues marked 'Within Normal Limits': Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 4506 | F | 4/1 | 22-Jun-15 12:52 | 22-Jun-15 | 427 | Within Normal Limits |
| 4507 | F | 4/1 | | | | Lungs |
| | | | 21-Jun-15 17:33 | 21-Jun-15 | 337 | Discolored, All lobes, Black, Mottled, , Severe |

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|---|---|---|---|---|---|---|
| 4507 | F | 4/1 | 21-Jun-15 17:52 | 21-Jun-15 | 337 | Tissues marked 'Within Normal Limits':<br>Adrenal Glands, Brain, Kidneys, Larynx<br>Liver, Nasopharynx, Ovaries, Pharynx<br>Pituitary, Spleen, Trachea, Uterus w/ Cervix<br>Vagina |
| 4508 | F | 4/1 | 21-Jun-15 16:27 | 21-Jun-15 | 337 | Within Normal Limits |
| 4509 | F | 4/1 | 12-Jul-15 09:58 | 12-Jul-15 | 46 | Uterus w/ Cervix<br>Implantation scars, , , , ,<br>Right=3<br>Left=11 |
| | | | 12-Jul-15 10:07 | 12-Jul-15 | 46 | Tissues marked 'Within Normal Limits':<br>Adrenal Glands, Brain, Kidneys, Larynx<br>Liver, Lungs, Nasopharynx, Ovaries<br>Pharynx, Pituitary, Spleen, Trachea<br>Vagina |
| 4510 | F | 4/1 | 10-Jul-15 09:48 | 10-Jul-15 | 461 | Uterus w/ Cervix<br>Implantation scars, , , , ,<br>Right= 7<br>Left= 8 |
| | | | 10-Jul-15 10:25 | 10-Jul-15 | 461 | Tissues marked 'Within Normal Limits':<br>Adrenal Glands, Brain, Kidneys, Larynx<br>Liver, Lungs, Nasopharynx, Ovaries<br>Pharynx, Pituitary, Spleen, Trachea<br>Vagina |
| 4511 | F | 4/1 | 21-Jun-15 15:05 | 21-Jun-15 | 337 | Within Normal Limits |
| 4512 | F | 4/1 | 12-Jul-15 10:57 | 12-Jul-15 | 459 | Uterus w/ Cervix<br>Implantation scars, , , , ,<br>Right = 8<br>Left = 5 |
| | | | 12-Jul-15 11:13 | 12-Jul-15 | 459 | Tissues marked 'Within Normal Limits':<br>Adrenal Glands, Brain, Kidneys, Larynx<br>Liver, Lungs, Nasopharynx, Ovaries<br>Pharynx, Pituitary, Spleen, Trachea<br>Vagina |
| 4513 | F | 4/1 | 11-Jul-15 09:58 | 11-Jul-15 | 222 | Uterus w/ Cervix<br>Implantation scars, , , , ,<br>Left horn=7, Right horn=5 |

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|---|---|---|---|---|---|---|
| 4513 | F | 4/1 | | | | Tissues marked 'Within Normal Limits': |
| | | | 11-Jul-15 10:13 | 11-Jul-15 | 222 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 4514 | F | 4/1 | | | | Lungs |
| | | | 21-Jun-15 17:01 | 21-Jun-15 | 337 | Discolored, Right cardiac lobe, Red, Area, 0.2 - 0.5 cm, |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 21-Jun-15 17:10 | 21-Jun-15 | 337 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Uterus w/ Cervix, Vagina |
| 4515 | F | 4/1 | | | | Uterus w/ Cervix |
| | | | 10-Jul-15 10:09 | 10-Jul-15 | 471 | Implantation scars, , , , , Right=6, Left=7 |
| | | | 10-Jul-15 10:10 | 10-Jul-15 | 471 | Implantation scars, , , , , |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 10-Jul-15 10:11 | 10-Jul-15 | 471 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 4516 | F | 4/1 | | | | Uterus w/ Cervix |
| | | | 09-Jul-15 13:24 | 09-Jul-15 | 461 | Implantation scars, , , , , Right= 7, Left= 7 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 09-Jul-15 13:24 | 09-Jul-15 | 461 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 4517 | F | 4/1 | | | | Uterus w/ Cervix |
| | | | 11-Jul-15 11:08 | 11-Jul-15 | 461 | Implantation scars, , , , , Right= 6, Left= 8 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 11-Jul-15 11:08 | 11-Jul-15 | 461 | Adrenal Glands, Brain, Kidneys, Larynx |

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|---|---|---|---|---|---|---|
| 4517 | F | 4/1 | 11-Jul-15 11:08 | 11-Jul-15 | 461 | Tissues marked 'Within Normal Limits':<br>Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 4518 | F | 4/1 | | | | Uterus w/ Cervix |
| | | | 10-Jul-15 10:10 | 10-Jul-15 | 222 | Implantation scars, , , , ,<br>Left horn= 8, Right horn= 7 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 10-Jul-15 10:23 | 10-Jul-15 | 222 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 4519 | F | 4/1 | 23-Jun-15 17:07 | 23-Jun-15 | 250 | Within Normal Limits |
| 4520 | F | 4/1 | 23-Jun-15 17:08 | 23-Jun-15 | 427 | Within Normal Limits |
| 4521 | F | 4/1 | | | | Uterus w/ Cervix |
| | | | 11-Jul-15 11:14 | 11-Jul-15 | 222 | Implantation scars, , , , ,<br>Left=7<br>Right=8 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 11-Jul-15 11:28 | 11-Jul-15 | 222 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 4522 | F | 4/1 | | | | Uterus w/ Cervix |
| | | | 13-Jul-15 20:36 | 13-Jul-15 | 395 | Implantation scars, , , , ,<br>Right=11, Left=7 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 13-Jul-15 20:47 | 13-Jul-15 | 395 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 4523 | F | 4/1 | | | | Uterus w/ Cervix |
| | | | 12-Jul-15 11:00 | 12-Jul-15 | 46 | Implantation scars, , , , ,<br>Right=10<br>Left=5 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 12-Jul-15 11:05 | 12-Jul-15 | 46 | Adrenal Glands, Brain, Kidneys, Larynx |

| | Parental macropathology - individual findings | Appendix 20 |
|---|---|---|

Envigo
Mettlers Road
P.O. Box 2360
Rat/CD IGS

Raw Data Listing of Gross Observations with Modifiers
Study number: 14-4417
Study start date: 03-Mar-15

Printed: 17-Feb-16
Page: 28
Segment III/Inhalation

| Animal number | Sex | Group/ Subgroup | Date and time data was entered | Date data taken | Opr # | Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels |
|---|---|---|---|---|---|---|
| 4523 | F | 4/1 | 12-Jul-15 11:05 | 12-Jul-15 | 46 | Tissues marked 'Within Normal Limits': Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 4524 | F | 4/1 | | | | Uterus w/ Cervix |
| | | | 12-Jul-15 11:53 | 12-Jul-15 | 459 | Implantation scars, , , , , Right = 3 Left = 8 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 12-Jul-15 12:08 | 12-Jul-15 | 459 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 4525 | F | 4/1 | | | | Lungs |
| | | | 10-Jul-15 11:16 | 10-Jul-15 | 470 | Discolored, Right apical lobe, Tan, Foci, </= 0.1 cm, Moderate |
| | | | 10-Jul-15 11:16 | 10-Jul-15 | 470 | Discolored, Right diaphragmatic lobe, Tan, Foci, </= 0.1 cm, Moderate |
| | | | 10-Jul-15 11:17 | 10-Jul-15 | 470 | Discolored, Left lobe(s), Tan, Foci, </= 0.1 cm, Moderate |
| | | | 10-Jul-15 11:17 | 10-Jul-15 | 470 | Discolored, Accessory lobe, Tan, Foci, </= 0.1 cm, Moderate |
| | | | 10-Jul-15 11:18 | 10-Jul-15 | 470 | Discolored, Accessory lobe, Red, Foci, </= 0.1 cm, Moderate |
| | | | | | | Uterus w/ Cervix |
| | | | 08-Sep-15 10:07 | 10-Jul-15 | 250 | Implantation scars, , , , , Horn #1-7 Horn #2-12 could not distinguish left and right horn due to urinary bladder being removed. |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 10-Jul-15 11:20 | 10-Jul-15 | 250 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |
| 4526 | F | 4/1 | | | | Uterus w/ Cervix |
| | | | 12-Jul-15 11:54 | 12-Jul-15 | 46 | Implantation scars, , , , , Right=7 Left=8 |
| | | | | | | Tissues marked 'Within Normal Limits': |
| | | | 12-Jul-15 11:58 | 12-Jul-15 | 46 | Adrenal Glands, Brain, Kidneys, Larynx, Liver, Lungs, Nasopharynx, Ovaries, Pharynx, Pituitary, Spleen, Trachea, Vagina |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 1501 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 12 | F | All tissues | No macropathology findings |
| | 13 | F | All tissues | No macropathology findings |
| | 15 | F | All tissues | No macropathology findings |
| 1502 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 6 | F | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 1503 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 6 | F | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| 1505 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |
| | 10 | F | All tissues | No macropathology findings |
| | 11 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 1506 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 5 | F | All tissues | No macropathology findings |
| | 6 | F | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| 1507 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 5 | F | All tissues | No macropathology findings |
| | 6 | F | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 1508 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 6 | F | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| 1510 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 5 | F | All tissues | No macropathology findings |
| | 6 | F | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 1511 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |
| | 10 | F | All tissues | No macropathology findings |
| 1514 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 5 | F | All tissues | No macropathology findings |
| | 6 | F | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 1515 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 10 | F | All tissues | No macropathology findings |
| | 11 | F | All tissues | No macropathology findings |
| 1516 | 5 | M | All tissues | No macropathology findings |
| | 11 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 1517 | 1 | M | All tissues | No macropathology findings |
| | 2 | F | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 5 | M | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |
| 1518 | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 4 | M | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |
| | 10 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 1519 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 11 | F | Hind limbs | Left hind limb toes cannibalized |
| 1520 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 5 | F | All tissues | No macropathology findings |
| | 6 | F | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 1523 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 4 | M | All tissues | No macropathology findings |
| | 5 | M | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |
| 1525 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 1526 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | Tail | Tail missing |
| | 4 | M | All tissues | No macropathology findings |
| | 10 | F | All tissues | No macropathology findings |
| | 11 | F | All tissues | No macropathology findings |
| | 12 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 2501 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |
| | 10 | F | All tissues | No macropathology findings |
| | 11 | F | All tissues | No macropathology findings |
| 2502 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 2503 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |
| 2504 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 4 | M | All tissues | No macropathology findings |
| | 12 | F | All tissues | No macropathology findings |
| | 13 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 2507 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 10 | F | All tissues | No macropathology findings |
| | 11 | F | All tissues | No macropathology findings |
| | 12 | F | All tissues | No macropathology findings |
| 2509 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 2510 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 11 | F | All tissues | No macropathology findings |
| | 12 | F | All tissues | No macropathology findings |
| 2512 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 10 | F | All tissues | No macropathology findings |
| | 11 | F | All tissues | No macropathology findings |
| | 13 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 2513 | 1 | M | Spleen | Spleen - small |
| | 2 | M | Spleen | Spleen - small |
| | 3 | M | All tissues | No macropathology findings |
| | 7 | F | Spleen | Spleen - small |
| | 8 | F | Spleen | Spleen - small |
| | 9 | F | All tissues | No macropathology findings |
| 2514 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 2515 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 10 | F | All tissues | No macropathology findings |
| | 11 | F | All tissues | No macropathology findings |
| | 12 | F | All tissues | No macropathology findings |
| 2517 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 5 | F | All tissues | No macropathology findings |
| | 6 | F | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 2518 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |
| 2519 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 5 | F | All tissues | No macropathology findings |
| | 6 | F | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 2520 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 10 | F | All tissues | No macropathology findings |
| | 13 | F | All tissues | No macropathology findings |
| 2521 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |
| | 10 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 2522 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 10 | F | All tissues | No macropathology findings |
| 2523 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |
| | 10 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 2524 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |
| | 10 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 3501 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |
| | 10 | F | All tissues | No macropathology findings |
| | 11 | F | All tissues | No macropathology findings |
| 3503 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 3505 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |
| 3506 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 6 | F | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 3507 | 5 | M | All tissues | No macropathology findings |
| | 11 | F | All tissues | No macropathology findings |
| | 13 | F | All tissues | No macropathology findings |
| 3508 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 10 | F | All tissues | No macropathology findings |
| | 11 | F | All tissues | No macropathology findings |
| | 12 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 3509 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 6 | F | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| 3510 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 6 | F | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 3511 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 4 | M | All tissues | No macropathology findings |
| | 5 | M | All tissues | No macropathology findings |
| | 6 | F | All tissues | No macropathology findings |
| 3512 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 11 | F | All tissues | No macropathology findings |
| | 12 | F | All tissues | No macropathology findings |
| | 13 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 3513 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 11 | F | All tissues | No macropathology findings |
| 3514 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 5 | F | All tissues | No macropathology findings |
| | 6 | F | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 3515 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |
| 3516 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |
| | 10 | F | All tissues | No macropathology findings |
| | 11 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 3518 | 6 | M | All tissues | No macropathology findings |
| 3520 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 6 | F | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 3522 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 4 | M | All tissues | No macropathology findings |
| | 5 | M | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| 3523 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 6 | F | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 3525 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 6 | F | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| 3526 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |
| | 10 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 4501 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 11 | F | All tissues | No macropathology findings |
| | 12 | F | All tissues | No macropathology findings |
| | 13 | F | All tissues | No macropathology findings |
| 4502 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 4503 | 3 | M | All tissues | No macropathology findings |
| | 4 | M | All tissues | No macropathology findings |
| | 5 | M | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |
| | 11 | F | All tissues | No macropathology findings |
| 4504 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 6 | F | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 4505 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |
| 4509 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 4510 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 11 | F | All tissues | No macropathology findings |
| | 12 | F | All tissues | No macropathology findings |
| | 13 | F | All tissues | No macropathology findings |
| 4512 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 6 | F | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 4513 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |
| 4515 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 10 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 4516 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |
| | 10 | F | All tissues | No macropathology findings |
| 4517 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 5 | F | All tissues | No macropathology findings |
| | 6 | F | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 4518 | 1 | F | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 4 | M | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| 4521 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |
| | 10 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 4522 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |
| | 10 | F | All tissues | No macropathology findings |
| | 11 | F | All tissues | No macropathology findings |
| 4523 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 6 | F | All tissues | No macropathology findings |
| | 7 | F | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 4524 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | F | All tissues | No macropathology findings |
| | 5 | F | All tissues | No macropathology findings |
| 4525 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | All tissues | No macropathology findings |
| | 8 | F | All tissues | No macropathology findings |
| | 9 | F | All tissues | No macropathology findings |

| | Pup necropsy observations - individual observations | Appendix 21 |
|---|---|---|

| Dam Number | Animal Number | Sex of pup | Tissue | Findings |
|---|---|---|---|---|
| 4526 | 1 | M | All tissues | No macropathology findings |
| | 2 | M | All tissues | No macropathology findings |
| | 3 | M | Spleen | Spleen - small |
| | 9 | F | Spleen | Spleen - small |
| | 10 | F | All tissues | No macropathology findings |
| | 11 | F | All tissues | No macropathology findings |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Brain | | | Pituitary | | | Adrenal Glands | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | |
| 1001 | 569.9 | 2.2836 | 0.4007 | 100.0000 | 0.0120 | 0.0021 | 0.5255 | 0.0613 | 0.0108 | 2.6844 |
| 1002 | 622.5 | 2.4523 | 0.3939 | 100.0000 | 0.0178 | 0.0029 | 0.7258 | 0.0683 | 0.0110 | 2.7851 |
| 1003 | 585.1 | 2.2993 | 0.3930 | 100.0000 | 0.0154 | 0.0026 | 0.6698 | 0.0573 | 0.0098 | 2.4921 |
| 1004 | 607.6 | 2.5083 | 0.4128 | 100.0000 | 0.0125 | 0.0021 | 0.4983 | 0.0506 | 0.0083 | 2.0173 |
| 1005 | 557.1 | 2.3999 | 0.4308 | 100.0000 | 0.0160 | 0.0029 | 0.6667 | 0.0648 | 0.0116 | 2.7001 |
| 1006 | 539.7 | 2.3488 | 0.4352 | 100.0000 | 0.0098 | 0.0018 | 0.4172 | 0.0503 | 0.0093 | 2.1415 |
| 1007 | 587.3 | 2.1858 | 0.3722 | 100.0000 | 0.0122 | 0.0021 | 0.5581 | 0.0496 | 0.0084 | 2.2692 |
| 1008 | 638.8 | 2.3161 | 0.3626 | 100.0000 | 0.0133 | 0.0021 | 0.5742 | 0.0586 | 0.0092 | 2.5301 |
| 1009 | 597.0 | 2.4206 | 0.4055 | 100.0000 | 0.0172 | 0.0029 | 0.7106 | 0.0509 | 0.0085 | 2.1028 |
| 1010 | 635.8 | 2.2546 | 0.3546 | 100.0000 | 0.0121 | 0.0019 | 0.5367 | 0.0658 | 0.0103 | 2.9185 |
| 1011 | 521.1 | 2.4071 | 0.4619 | 100.0000 | 0.0124 | 0.0024 | 0.5151 | 0.0703 | 0.0135 | 2.9205 |
| 1012 | 632.3 | 2.2854 | 0.3614 | 100.0000 | 0.0066 | 0.0010 | 0.2888 | 0.0382 | 0.0060 | 1.6715 |
| 1013 | 630.4 | 2.1716 | 0.3445 | 100.0000 | 0.0145 | 0.0023 | 0.6677 | 0.0469 | 0.0074 | 2.1597 |
| 1014 | 618.0 | 2.2319 | 0.3611 | 100.0000 | 0.0136 | 0.0022 | 0.6093 | 0.0771 | 0.0125 | 3.4545 |
| 1015 | 592.1 | 2.4788 | 0.4186 | 100.0000 | 0.0151 | 0.0026 | 0.6092 | 0.0597 | 0.0101 | 2.4084 |
| 1016 | 587.5 | 2.3410 | 0.3985 | 100.0000 | 0.0147 | 0.0025 | 0.6279 | 0.0444 | 0.0076 | 1.8966 |
| 1017 | 497.8 | 2.1294 | 0.4278 | 100.0000 | 0.0147 | 0.0030 | 0.6903 | 0.0418 | 0.0084 | 1.9630 |
| 1018 | 627.2 | 2.5715 | 0.4100 | 100.0000 | 0.0153 | 0.0024 | 0.5950 | 0.0607 | 0.0097 | 2.3605 |
| 1019 | 541.8 | 2.1411 | 0.3952 | 100.0000 | 0.0124 | 0.0023 | 0.5791 | 0.0658 | 0.0121 | 3.0732 |
| 1020 | 662.8 | 2.3496 | 0.3545 | 100.0000 | 0.0175 | 0.0026 | 0.7448 | 0.0509 | 0.0077 | 2.1663 |
| 1021 | 712.3 | 2.2770 | 0.3197 | 100.0000 | 0.0125 | 0.0018 | 0.5490 | 0.0506 | 0.0071 | 2.2222 |
| 1022 | 567.7 | 2.2145 | 0.3901 | 100.0000 | 0.0134 | 0.0024 | 0.6051 | 0.0484 | 0.0085 | 2.1856 |
| 1023 | 566.2 | 2.3378 | 0.4129 | 100.0000 | 0.0137 | 0.0024 | 0.5860 | 0.0506 | 0.0089 | 2.1644 |
| 1024 | 639.5 | 2.2421 | 0.3506 | 100.0000 | 0.0140 | 0.0022 | 0.6244 | 0.0559 | 0.0087 | 2.4932 |
| 1025 | 529.9 | 2.3661 | 0.4465 | 100.0000 | 0.0157 | 0.0030 | 0.6635 | 0.0535 | 0.0101 | 2.2611 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Brain | | | Pituitary | | | Adrenal Glands | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | |
| 1026 | 577.6 | 2.1973 | 0.3804 | 100.0000 | 0.0118 | 0.0020 | 0.5370 | 0.0493 | 0.0085 | 2.2437 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Brain | | | Pituitary | | | Adrenal Glands | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | |
| 2001 | 499.0 | 2.2577 | 0.4524 | 100.0000 | 0.0123 | 0.0025 | 0.5448 | 0.0434 | 0.0087 | 1.9223 |
| 2002 | 677.6 | 2.2942 | 0.3386 | 100.0000 | 0.0160 | 0.0024 | 0.6974 | 0.0721 | 0.0106 | 3.1427 |
| 2003 | 532.8 | 2.4451 | 0.4589 | 100.0000 | 0.0154 | 0.0029 | 0.6298 | 0.0520 | 0.0098 | 2.1267 |
| 2004 | 616.2 | 2.2858 | 0.3710 | 100.0000 | 0.0129 | 0.0021 | 0.5644 | 0.0602 | 0.0098 | 2.6337 |
| 2005 | 565.1 | 2.3064 | 0.4081 | 100.0000 | 0.0111 | 0.0020 | 0.4813 | 0.0457 | 0.0081 | 1.9814 |
| 2006 | 555.6 | 2.3904 | 0.4302 | 100.0000 | 0.0127 | 0.0023 | 0.5313 | 0.0469 | 0.0084 | 1.9620 |
| 2007 | 595.2 | 2.4681 | 0.4147 | 100.0000 | 0.0170 | 0.0029 | 0.6888 | 0.0485 | 0.0081 | 1.9651 |
| 2008 | 547.9 | 2.3538 | 0.4296 | 100.0000 | 0.0139 | 0.0025 | 0.5905 | 0.0583 | 0.0106 | 2.4768 |
| 2009 | 569.8 | 2.4721 | 0.4339 | 100.0000 | 0.0116 | 0.0020 | 0.4692 | 0.0473 | 0.0083 | 1.9134 |
| 2010 | 591.8 | 2.3262 | 0.3931 | 100.0000 | 0.0155 | 0.0026 | 0.6663 | 0.0441 | 0.0075 | 1.8958 |
| 2011 | 525.4 | 2.3607 | 0.4493 | 100.0000 | 0.0125 | 0.0024 | 0.5295 | 0.0596 | 0.0113 | 2.5247 |
| 2012 | 625.8 | 2.3505 | 0.3756 | 100.0000 | 0.0130 | 0.0021 | 0.5531 | 0.0538 | 0.0086 | 2.2889 |
| 2013 | 635.2 | 2.5440 | 0.4005 | 100.0000 | 0.0137 | 0.0022 | 0.5385 | 0.0559 | 0.0088 | 2.1973 |
| 2014 | 611.4 | 2.2792 | 0.3728 | 100.0000 | 0.0131 | 0.0021 | 0.5748 | 0.0563 | 0.0092 | 2.4702 |
| 2015 | 518.5 | 2.3510 | 0.4534 | 100.0000 | 0.0136 | 0.0026 | 0.5785 | 0.0624 | 0.0120 | 2.6542 |
| 2016 | 549.5 | 2.1832 | 0.3973 | 100.0000 | 0.0114 | 0.0021 | 0.5222 | 0.0559 | 0.0102 | 2.5605 |
| 2017 | 579.5 | 2.3982 | 0.4138 | 100.0000 | 0.0116 | 0.0020 | 0.4837 | 0.0555 | 0.0096 | 2.3142 |
| 2018 | 589.8 | 2.1313 | 0.3614 | 100.0000 | 0.0154 | 0.0026 | 0.7226 | 0.0670 | 0.0114 | 3.1436 |
| 2019 | 724.3 | 2.5797 | 0.3562 | 100.0000 | 0.0196 | 0.0027 | 0.7598 | 0.0674 | 0.0093 | 2.6127 |
| 2020 | 559.4 | 2.3169 | 0.4142 | 100.0000 | 0.0104 | 0.0019 | 0.4489 | 0.0648 | 0.0116 | 2.7968 |
| 2021 | 698.4 | 2.5157 | 0.3602 | 100.0000 | 0.0147 | 0.0021 | 0.5843 | 0.0677 | 0.0097 | 2.6911 |
| 2022 | 627.9 | 2.2369 | 0.3563 | 100.0000 | 0.0157 | 0.0025 | 0.7019 | 0.0617 | 0.0098 | 2.7583 |
| 2023 | 600.2 | 2.3218 | 0.3868 | 100.0000 | 0.0133 | 0.0022 | 0.5728 | 0.0590 | 0.0098 | 2.5411 |
| 2024 | 613.0 | 2.3801 | 0.3883 | 100.0000 | 0.0153 | 0.0025 | 0.6428 | 0.0551 | 0.0090 | 2.3150 |
| 2025 | 537.5 | 2.3904 | 0.4447 | 100.0000 | 0.0127 | 0.0024 | 0.5313 | 0.0533 | 0.0099 | 2.2298 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Brain | | | Pituitary | | | Adrenal Glands | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | |
| 2026 | 492.3 | 2.2864 | 0.4644 | 100.0000 | 0.0118 | 0.0024 | 0.5161 | 0.0599 | 0.0122 | 2.6198 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Brain | | | Pituitary | | | Adrenal Glands | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | |
| 3001 | 532.6 | 2.4225 | 0.4548 | 100.0000 | 0.0153 | 0.0029 | 0.6316 | 0.0577 | 0.0108 | 2.3818 |
| 3003 | 585.3 | 2.3962 | 0.4094 | 100.0000 | 0.0118 | 0.0020 | 0.4924 | 0.0684 | 0.0117 | 2.8545 |
| 3004 | 549.9 | 2.2688 | 0.4126 | 100.0000 | 0.0163 | 0.0030 | 0.7184 | 0.0588 | 0.0107 | 2.5917 |
| 3005 | 582.1 | 2.4016 | 0.4126 | 100.0000 | 0.0103 | 0.0018 | 0.4289 | 0.0590 | 0.0101 | 2.4567 |
| 3006 | 581.7 | 2.3490 | 0.4038 | 100.0000 | 0.0114 | 0.0020 | 0.4853 | 0.0583 | 0.0100 | 2.4819 |
| 3007 | 536.0 | 2.3617 | 0.4406 | 100.0000 | 0.0107 | 0.0020 | 0.4531 | 0.0599 | 0.0112 | 2.5363 |
| 3008 | 497.0 | 2.2217 | 0.4470 | 100.0000 | 0.0136 | 0.0027 | 0.6121 | 0.0204 | 0.0041 | 0.9182 |
| 3009 | 605.1 | 2.3631 | 0.3905 | 100.0000 | 0.0129 | 0.0021 | 0.5459 | 0.0586 | 0.0097 | 2.4798 |
| 3010 | 660.0 | 2.4377 | 0.3693 | 100.0000 | 0.0131 | 0.0020 | 0.5374 | 0.0614 | 0.0093 | 2.5188 |
| 3011 | 564.7 | 2.3032 | 0.4079 | 100.0000 | 0.0146 | 0.0026 | 0.6339 | 0.0460 | 0.0081 | 1.9972 |
| 3012 | 617.3 | 2.3434 | 0.3796 | 100.0000 | 0.0170 | 0.0028 | 0.7254 | 0.0547 | 0.0089 | 2.3342 |
| 3013 | 525.8 | 2.3205 | 0.4413 | 100.0000 | 0.0128 | 0.0024 | 0.5516 | 0.0576 | 0.0110 | 2.4822 |
| 3014 | 651.9 | 2.4309 | 0.3729 | 100.0000 | 0.0087 | 0.0013 | 0.3579 | 0.0494 | 0.0076 | 2.0322 |
| 3015 | 468.0 | 2.4250 | 0.5182 | 100.0000 | 0.0115 | 0.0025 | 0.4742 | 0.0591 | 0.0126 | 2.4371 |
| 3016 | 617.2 | 2.5771 | 0.4175 | 100.0000 | 0.0124 | 0.0020 | 0.4812 | 0.0403 | 0.0065 | 1.5638 |
| 3017 | 741.0 | 2.3432 | 0.3162 | 100.0000 | 0.0112 | 0.0015 | 0.4780 | 0.0440 | 0.0059 | 1.8778 |
| 3018 | 735.5 | 2.3208 | 0.3155 | 100.0000 | 0.0131 | 0.0018 | 0.5645 | 0.0618 | 0.0084 | 2.6629 |
| 3019 | 643.7 | 2.4450 | 0.3798 | 100.0000 | 0.0112 | 0.0017 | 0.4581 | 0.0576 | 0.0089 | 2.3558 |
| 3020 | 688.3 | 2.4808 | 0.3604 | 100.0000 | 0.0164 | 0.0024 | 0.6611 | 0.0680 | 0.0099 | 2.7411 |
| 3021 | 600.8 | 2.2770 | 0.3790 | 100.0000 | 0.0171 | 0.0028 | 0.7510 | 0.0658 | 0.0110 | 2.8898 |
| 3022 | 590.7 | 2.4618 | 0.4168 | 100.0000 | 0.0148 | 0.0025 | 0.6012 | 0.0706 | 0.0120 | 2.8678 |
| 3023 | 544.7 | 2.4619 | 0.4520 | 100.0000 | 0.0135 | 0.0025 | 0.5484 | 0.0571 | 0.0105 | 2.3193 |
| 3024 | 600.4 | 2.2531 | 0.3753 | 100.0000 | 0.0119 | 0.0020 | 0.5282 | 0.0571 | 0.0095 | 2.5343 |
| 3025 | 611.9 | 2.3408 | 0.3825 | 100.0000 | 0.0095 | 0.0016 | 0.4058 | 0.0626 | 0.0102 | 2.6743 |
| 3026 | 525.4 | 2.3561 | 0.4484 | 100.0000 | 0.0110 | 0.0021 | 0.4669 | 0.0502 | 0.0096 | 2.1306 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Brain | | | Pituitary | | | Adrenal Glands | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | |
| 4001 | 549.1 | 2.2244 | 0.4051 | 100.0000 | 0.0122 | 0.0022 | 0.5485 | 0.0537 | 0.0098 | 2.4141 |
| 4002 | 593.0 | 2.3228 | 0.3917 | 100.0000 | 0.0142 | 0.0024 | 0.6113 | 0.0628 | 0.0106 | 2.7036 |
| 4003 | 639.1 | 2.3460 | 0.3671 | 100.0000 | 0.0136 | 0.0021 | 0.5797 | 0.0673 | 0.0105 | 2.8687 |
| 4004 | 564.1 | 2.2679 | 0.4020 | 100.0000 | 0.0118 | 0.0021 | 0.5203 | 0.0525 | 0.0093 | 2.3149 |
| 4005 | 561.5 | 2.4613 | 0.4383 | 100.0000 | 0.0182 | 0.0032 | 0.7394 | 0.0788 | 0.0140 | 3.2016 |
| 4006 | 539.4 | 2.3809 | 0.4414 | 100.0000 | 0.0150 | 0.0028 | 0.6300 | 0.0435 | 0.0081 | 1.8270 |
| 4007 | 520.6 | 2.2309 | 0.4285 | 100.0000 | 0.0118 | 0.0023 | 0.5289 | 0.0520 | 0.0100 | 2.3309 |
| 4008 | 566.5 | 2.3232 | 0.4101 | 100.0000 | 0.0123 | 0.0022 | 0.5294 | 0.0648 | 0.0114 | 2.7893 |
| 4009 | 696.1 | 2.3073 | 0.3315 | 100.0000 | 0.0119 | 0.0017 | 0.5158 | 0.0625 | 0.0090 | 2.7088 |
| 4010 | 594.7 | 2.3090 | 0.3883 | 100.0000 | 0.0136 | 0.0023 | 0.5890 | 0.0676 | 0.0114 | 2.9277 |
| 4011 | 775.0 | 2.3986 | 0.3095 | 100.0000 | 0.0146 | 0.0019 | 0.6087 | 0.0624 | 0.0081 | 2.6015 |
| 4012 | 633.1 | 2.4050 | 0.3799 | 100.0000 | 0.0143 | 0.0023 | 0.5946 | 0.0587 | 0.0093 | 2.4407 |
| 4013 | 512.6 | 2.2540 | 0.4397 | 100.0000 | 0.0140 | 0.0027 | 0.6211 | 0.0572 | 0.0112 | 2.5377 |
| 4014 | 544.1 | 2.2545 | 0.4144 | 100.0000 | 0.0152 | 0.0028 | 0.6742 | 0.0445 | 0.0082 | 1.9738 |
| 4015 | 647.8 | 2.3619 | 0.3646 | 100.0000 | 0.0127 | 0.0020 | 0.5377 | 0.0491 | 0.0076 | 2.0788 |
| 4016 | 577.5 | 2.3253 | 0.4026 | 100.0000 | 0.0156 | 0.0027 | 0.6709 | 0.0652 | 0.0113 | 2.8039 |
| 4017 | 665.9 | 2.3302 | 0.3499 | 100.0000 | 0.0129 | 0.0019 | 0.5536 | 0.0493 | 0.0074 | 2.1157 |
| 4018 | 550.7 | 2.2619 | 0.4107 | 100.0000 | 0.0136 | 0.0025 | 0.6013 | 0.0628 | 0.0114 | 2.7764 |
| 4019 | 525.9 | 2.4752 | 0.4707 | 100.0000 | 0.0132 | 0.0025 | 0.5333 | 0.0546 | 0.0104 | 2.2059 |
| 4020 | 572.8 | 2.4770 | 0.4324 | 100.0000 | 0.0097 | 0.0017 | 0.3916 | 0.0544 | 0.0095 | 2.1962 |
| 4021 | 648.6 | 2.3540 | 0.3629 | 100.0000 | 0.0102 | 0.0016 | 0.4333 | 0.0707 | 0.0109 | 3.0034 |
| 4022 | 751.3 | 2.5165 | 0.3350 | 100.0000 | 0.0155 | 0.0021 | 0.6159 | 0.0733 | 0.0098 | 2.9128 |
| 4023 | 529.4 | 2.3468 | 0.4433 | 100.0000 | 0.0103 | 0.0019 | 0.4389 | 0.0539 | 0.0102 | 2.2967 |
| 4024 | 597.9 | 2.1028 | 0.3517 | 100.0000 | 0.0091 | 0.0015 | 0.4328 | 0.0611 | 0.0102 | 2.9056 |
| 4025 | 579.4 | 2.3376 | 0.4035 | 100.0000 | 0.0178 | 0.0031 | 0.7615 | 0.0647 | 0.0112 | 2.7678 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Brain | | | Pituitary | | | Adrenal Glands | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | |
| 4026 | 605.2 | 2.2661 | 0.3744 | 100.0000 | 0.0123 | 0.0020 | 0.5428 | 0.0520 | 0.0086 | 2.2947 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Spleen | | | Kidneys | | | Liver | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | |
| 1001 | 569.9 | 1.9607 | 0.3440 | 85.8600 | 3.3543 | 0.5886 | 146.8865 | 17.7186 | 3.1091 | 775.9065 |
| 1002 | 622.5 | 0.9674 | 0.1554 | 39.4487 | 4.0490 | 0.6504 | 165.1103 | 16.4561 | 2.6436 | 671.0476 |
| 1003 | 585.1 | 1.1517 | 0.1968 | 50.0892 | 4.3650 | 0.7460 | 189.8404 | 17.8826 | 3.0563 | 777.7411 |
| 1004 | 607.6 | 1.1308 | 0.1861 | 45.0823 | 3.4889 | 0.5742 | 139.0942 | 15.7502 | 2.5922 | 627.9233 |
| 1005 | 557.1 | 1.1722 | 0.2104 | 48.8437 | 3.8103 | 0.6840 | 158.7691 | 14.5803 | 2.6172 | 607.5378 |
| 1006 | 539.7 | 0.6725 | 0.1246 | 28.6316 | 3.2502 | 0.6022 | 138.3770 | 15.8291 | 2.9329 | 673.9229 |
| 1007 | 587.3 | 1.1102 | 0.1890 | 50.7915 | 3.4396 | 0.5857 | 157.3611 | 14.5658 | 2.4801 | 666.3830 |
| 1008 | 638.8 | 1.0641 | 0.1666 | 45.9436 | 3.6066 | 0.5646 | 155.7187 | 18.1543 | 2.8419 | 783.8306 |
| 1009 | 597.0 | 0.9966 | 0.1669 | 41.1716 | 3.8209 | 0.6400 | 157.8493 | 16.7638 | 2.8080 | 692.5473 |
| 1010 | 635.8 | 0.8852 | 0.1392 | 39.2620 | 3.6721 | 0.5776 | 162.8715 | 18.6465 | 2.9328 | 827.0425 |
| 1011 | 521.1 | 0.8799 | 0.1689 | 36.5544 | 3.8462 | 0.7381 | 159.7856 | 15.3234 | 2.9406 | 636.5917 |
| 1012 | 632.3 | 1.1371 | 0.1798 | 49.7550 | 3.6237 | 0.5731 | 158.5587 | 17.0615 | 2.6983 | 746.5433 |
| 1013 | 630.4 | 1.0789 | 0.1711 | 49.6823 | 3.6671 | 0.5817 | 168.8663 | 16.5857 | 2.6310 | 763.7548 |
| 1014 | 618.0 | 1.2091 | 0.1956 | 54.1736 | 4.1566 | 0.6726 | 186.2359 | 16.6212 | 2.6895 | 744.7108 |
| 1015 | 592.1 | 1.1062 | 0.1868 | 44.6264 | 3.9415 | 0.6657 | 159.0084 | 16.7417 | 2.8275 | 675.3954 |
| 1016 | 587.5 | 1.0187 | 0.1734 | 43.5156 | 2.9725 | 0.5060 | 126.9757 | 15.0062 | 2.5542 | 641.0167 |
| 1017 | 497.8 | 0.9155 | 0.1839 | 42.9933 | 3.1943 | 0.6417 | 150.0094 | 19.1940 | 3.8558 | 901.3807 |
| 1018 | 627.2 | 1.1060 | 0.1763 | 43.0099 | 3.9726 | 0.6334 | 154.4857 | 20.6344 | 3.2899 | 802.4266 |
| 1019 | 541.8 | 1.0065 | 0.1858 | 47.0085 | 3.3681 | 0.6217 | 157.3070 | 15.5415 | 2.8685 | 725.8652 |
| 1020 | 662.8 | 1.1386 | 0.1718 | 48.4593 | 3.8932 | 0.5874 | 165.6963 | 17.8129 | 2.6875 | 758.1248 |
| 1021 | 712.3 | 1.0706 | 0.1503 | 47.0180 | 3.7224 | 0.5226 | 163.4783 | 19.5569 | 2.7456 | 858.8889 |
| 1022 | 567.7 | 1.1354 | 0.2000 | 51.2712 | 3.9031 | 0.6875 | 176.2520 | 14.2760 | 2.5147 | 644.6602 |
| 1023 | 566.2 | 1.2368 | 0.2184 | 52.9044 | 3.9389 | 0.6957 | 168.4875 | 16.5743 | 2.9273 | 708.9700 |
| 1024 | 639.5 | 1.1528 | 0.1803 | 51.4161 | 3.6138 | 0.5651 | 161.1793 | 16.3698 | 2.5598 | 730.1102 |
| 1025 | 529.9 | 0.9005 | 0.1699 | 38.0584 | 3.8390 | 0.7245 | 162.2501 | 13.9386 | 2.6304 | 589.0960 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Spleen | | | Kidneys | | | Liver | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | |
| 1026 | 577.6 | 0.6482 | 0.1122 | 29.4998 | 3.3523 | 0.5804 | 152.5645 | 13.7735 | 2.3846 | 626.8375 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Spleen | | | Kidneys | | | Liver | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | |
| 2001 | 499.0 | 0.7342 | 0.1471 | 32.5198 | 3.5310 | 0.7076 | 156.3981 | 16.3159 | 3.2697 | 722.6779 |
| 2002 | 677.6 | 1.5216 | 0.2246 | 66.3238 | 4.8797 | 0.7201 | 212.6972 | 20.3238 | 2.9994 | 885.8774 |
| 2003 | 532.8 | 0.9909 | 0.1860 | 40.5259 | 4.0240 | 0.7553 | 164.5740 | 18.3151 | 3.4375 | 749.0532 |
| 2004 | 616.2 | 1.1604 | 0.1883 | 50.7656 | 4.0490 | 0.6571 | 177.1371 | 17.0226 | 2.7625 | 744.7108 |
| 2005 | 565.1 | 0.9564 | 0.1692 | 41.4672 | 3.8129 | 0.6747 | 165.3182 | 14.0315 | 2.4830 | 608.3724 |
| 2006 | 555.6 | 0.9381 | 0.1688 | 39.2445 | 3.6457 | 0.6562 | 152.5142 | 14.2601 | 2.5666 | 596.5571 |
| 2007 | 595.2 | 0.8583 | 0.1442 | 34.7757 | 4.0325 | 0.6775 | 163.3848 | 16.7247 | 2.8099 | 677.6346 |
| 2008 | 547.9 | 1.1688 | 0.2133 | 49.6559 | 3.4573 | 0.6310 | 146.8816 | 18.0576 | 3.2958 | 767.1680 |
| 2009 | 569.8 | 0.8098 | 0.1421 | 32.7576 | 3.5118 | 0.6163 | 142.0574 | 17.1731 | 3.0139 | 694.6766 |
| 2010 | 591.8 | 1.0960 | 0.1852 | 47.1155 | 4.0247 | 0.6801 | 173.0161 | 16.3421 | 2.7614 | 702.5234 |
| 2011 | 525.4 | 0.8737 | 0.1663 | 37.0102 | 3.3101 | 0.6300 | 140.2169 | 14.6794 | 2.7939 | 621.8240 |
| 2012 | 625.8 | 1.1371 | 0.1817 | 48.3769 | 4.4810 | 0.7160 | 190.6403 | 21.5977 | 3.4512 | 918.8556 |
| 2013 | 635.2 | 1.1717 | 0.1845 | 46.0574 | 5.3329 | 0.8396 | 209.6266 | 20.7574 | 3.2679 | 815.9355 |
| 2014 | 611.4 | 0.8380 | 0.1371 | 36.7673 | 4.0331 | 0.6596 | 176.9524 | 17.7432 | 2.9021 | 778.4837 |
| 2015 | 518.5 | 0.9039 | 0.1743 | 38.4475 | 3.5562 | 0.6859 | 151.2633 | 14.5039 | 2.7973 | 616.9247 |
| 2016 | 549.5 | 0.9574 | 0.1742 | 43.8531 | 3.4953 | 0.6361 | 160.0999 | 14.9311 | 2.7172 | 683.9089 |
| 2017 | 579.5 | 1.5435 | 0.2664 | 64.3608 | 4.6748 | 0.8067 | 194.9295 | 20.2590 | 3.4959 | 844.7586 |
| 2018 | 589.8 | 1.0453 | 0.1772 | 49.0452 | 3.3276 | 0.5642 | 156.1301 | 17.0807 | 2.8960 | 801.4217 |
| 2019 | 724.3 | 1.1085 | 0.1530 | 42.9701 | 5.1893 | 0.7165 | 201.1590 | 21.1775 | 2.9239 | 820.9288 |
| 2020 | 559.4 | 1.0300 | 0.1841 | 44.4560 | 3.4247 | 0.6122 | 147.8139 | 13.2658 | 2.3714 | 572.5668 |
| 2021 | 698.4 | 1.3093 | 0.1875 | 52.0452 | 4.3550 | 0.6236 | 173.1129 | 20.1888 | 2.8907 | 802.5122 |
| 2022 | 627.9 | 1.1827 | 0.1884 | 52.8723 | 3.9250 | 0.6251 | 175.4660 | 19.3938 | 3.0887 | 866.9945 |
| 2023 | 600.2 | 1.1340 | 0.1889 | 48.8414 | 4.2012 | 0.7000 | 180.9458 | 17.6325 | 2.9378 | 759.4323 |
| 2024 | 613.0 | 1.1059 | 0.1804 | 46.4644 | 3.6269 | 0.5917 | 152.3844 | 16.0348 | 2.6158 | 673.7028 |
| 2025 | 537.5 | 0.8375 | 0.1558 | 35.0360 | 4.1349 | 0.7693 | 172.9794 | 14.2615 | 2.6533 | 596.6156 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Spleen | | | Kidneys | | | Liver | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | |
| 2026 | 492.3 | 1.3692 | 0.2781 | 59.8845 | 3.7933 | 0.7705 | 165.9071 | 14.0044 | 2.8447 | 612.5087 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Spleen | | | Kidneys | | | Liver | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | |
| 3001 | 532.6 | 1.1590 | 0.2176 | 47.8431 | 4.0218 | 0.7551 | 166.0186 | 15.0294 | 2.8219 | 620.4087 |
| 3003 | 585.3 | 0.9946 | 0.1699 | 41.5074 | 4.2341 | 0.7234 | 176.7006 | 16.3207 | 2.7884 | 681.1076 |
| 3004 | 549.9 | 1.1570 | 0.2104 | 50.9961 | 4.2325 | 0.7697 | 186.5524 | 15.6192 | 2.8404 | 688.4344 |
| 3005 | 582.1 | 1.1286 | 0.1939 | 46.9937 | 4.1323 | 0.7099 | 172.0645 | 16.1145 | 2.7683 | 670.9902 |
| 3006 | 581.7 | 1.2745 | 0.2191 | 54.2571 | 4.1008 | 0.7050 | 174.5764 | 15.7337 | 2.7048 | 669.8042 |
| 3007 | 536.0 | 1.0781 | 0.2011 | 45.6493 | 3.6452 | 0.6801 | 154.3464 | 14.1441 | 2.6388 | 598.8949 |
| 3008 | 497.0 | 0.9706 | 0.1953 | 43.6873 | 3.7265 | 0.7498 | 167.7319 | 14.7234 | 2.9625 | 662.7087 |
| 3009 | 605.1 | 0.9696 | 0.1602 | 41.0308 | 3.9672 | 0.6556 | 167.8812 | 18.4452 | 3.0483 | 780.5510 |
| 3010 | 660.0 | 0.8695 | 0.1317 | 35.6689 | 4.4102 | 0.6682 | 180.9164 | 19.1850 | 2.9068 | 787.0123 |
| 3011 | 564.7 | 1.0246 | 0.1814 | 44.4859 | 3.9817 | 0.7051 | 172.8769 | 18.1665 | 3.2170 | 788.7504 |
| 3012 | 617.3 | 1.0680 | 0.1730 | 45.5748 | 4.3355 | 0.7023 | 185.0090 | 18.9661 | 3.0724 | 809.3411 |
| 3013 | 525.8 | 0.8387 | 0.1595 | 36.1431 | 3.2847 | 0.6247 | 141.5514 | 14.0379 | 2.6698 | 604.9515 |
| 3014 | 651.9 | 1.0772 | 0.1652 | 44.3128 | 2.8245 | 0.4333 | 116.1915 | 19.0827 | 2.9272 | 785.0056 |
| 3015 | 468.0 | 0.8709 | 0.1861 | 35.9134 | 3.7724 | 0.8061 | 155.5629 | 15.6294 | 3.3396 | 644.5113 |
| 3016 | 617.2 | 1.1635 | 0.1885 | 45.1476 | 4.2226 | 0.6842 | 163.8508 | 20.6101 | 3.3393 | 799.7400 |
| 3017 | 741.0 | 1.0710 | 0.1445 | 45.7067 | 4.5268 | 0.6109 | 193.1888 | 20.5796 | 2.7773 | 878.2690 |
| 3018 | 735.5 | 1.3433 | 0.1826 | 57.8809 | 4.5679 | 0.6211 | 196.8244 | 23.1695 | 3.1502 | 998.3411 |
| 3019 | 643.7 | 1.2777 | 0.1985 | 52.2577 | 4.6812 | 0.7272 | 191.4601 | 20.4982 | 3.1844 | 838.3722 |
| 3020 | 688.3 | 1.3068 | 0.1899 | 52.6766 | 4.5119 | 0.6555 | 181.8728 | 19.1618 | 2.7839 | 772.4041 |
| 3021 | 600.8 | 1.1560 | 0.1924 | 50.7686 | 4.0402 | 0.6725 | 177.4352 | 19.4594 | 3.2389 | 854.6069 |
| 3022 | 590.7 | 1.0309 | 0.1745 | 41.8759 | 4.0604 | 0.6874 | 164.9362 | 18.5385 | 3.1384 | 753.0466 |
| 3023 | 544.7 | 0.7387 | 0.1356 | 30.0053 | 3.6225 | 0.6650 | 147.1425 | 15.2696 | 2.8033 | 620.2364 |
| 3024 | 600.4 | 0.9634 | 0.1605 | 42.7589 | 4.1880 | 0.6975 | 185.8772 | 17.5648 | 2.9255 | 779.5837 |
| 3025 | 611.9 | 1.0938 | 0.1788 | 46.7276 | 4.0747 | 0.6659 | 174.0730 | 16.4854 | 2.6941 | 704.2635 |
| 3026 | 525.4 | 0.9135 | 0.1739 | 38.7717 | 3.7361 | 0.7111 | 158.5714 | 15.4083 | 2.9327 | 653.9748 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Spleen | | | Kidneys | | | Liver | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | |
| 4001 | 549.1 | 1.0330 | 0.1881 | 46.4395 | 3.8653 | 0.7039 | 173.7682 | 15.4095 | 2.8063 | 692.7486 |
| 4002 | 593.0 | 0.8510 | 0.1435 | 36.6368 | 4.1156 | 0.6940 | 177.1827 | 17.1738 | 2.8961 | 739.3577 |
| 4003 | 639.1 | 1.1890 | 0.1860 | 50.6820 | 4.7561 | 0.7442 | 202.7323 | 20.7215 | 3.2423 | 883.2694 |
| 4004 | 564.1 | 0.9679 | 0.1716 | 42.6782 | 4.0787 | 0.7230 | 179.8448 | 19.2436 | 3.4114 | 848.5207 |
| 4005 | 561.5 | 1.1121 | 0.1981 | 45.1834 | 4.8728 | 0.8678 | 197.9767 | 16.8160 | 2.9948 | 683.2162 |
| 4006 | 539.4 | 0.9932 | 0.1841 | 41.7153 | 3.8331 | 0.7106 | 160.9937 | 20.2153 | 3.7477 | 849.0613 |
| 4007 | 520.6 | 0.9898 | 0.1901 | 44.3677 | 3.5543 | 0.6827 | 159.3214 | 13.9801 | 2.6854 | 626.6574 |
| 4008 | 566.5 | 0.9576 | 0.1690 | 41.2190 | 4.3086 | 0.7606 | 185.4597 | 16.6659 | 2.9419 | 717.3683 |
| 4009 | 696.1 | 0.9601 | 0.1379 | 41.6114 | 4.7432 | 0.6814 | 205.5736 | 21.9770 | 3.1572 | 952.4986 |
| 4010 | 594.7 | 1.0299 | 0.1732 | 44.6037 | 3.4511 | 0.5803 | 149.4630 | 17.6769 | 2.9724 | 765.5652 |
| 4011 | 775.0 | 1.5184 | 0.1959 | 63.3036 | 5.6120 | 0.7241 | 233.9698 | 27.3308 | 3.5266 | 1139.4480 |
| 4012 | 633.1 | 0.9209 | 0.1455 | 38.2911 | 4.0094 | 0.6333 | 166.7110 | 18.9218 | 2.9888 | 786.7692 |
| 4013 | 512.6 | 0.8855 | 0.1727 | 39.2857 | 3.5693 | 0.6963 | 158.3540 | 14.6793 | 2.8637 | 651.2555 |
| 4014 | 544.1 | 0.9129 | 0.1678 | 40.4923 | 3.6395 | 0.6689 | 161.4327 | 17.1858 | 3.1586 | 762.2888 |
| 4015 | 647.8 | 0.9743 | 0.1504 | 41.2507 | 4.1412 | 0.6393 | 175.3334 | 20.8866 | 3.2242 | 884.3135 |
| 4016 | 577.5 | 1.1290 | 0.1955 | 48.5529 | 4.6229 | 0.8005 | 198.8088 | 19.7065 | 3.4124 | 847.4820 |
| 4017 | 665.9 | 1.0242 | 0.1538 | 43.9533 | 4.7612 | 0.7150 | 204.3258 | 20.6372 | 3.0991 | 885.6407 |
| 4018 | 550.7 | 1.1379 | 0.2066 | 50.3073 | 4.3533 | 0.7905 | 192.4621 | 20.3682 | 3.6986 | 900.4907 |
| 4019 | 525.9 | 1.0579 | 0.2012 | 42.7400 | 4.2672 | 0.8114 | 172.3982 | 14.3464 | 2.7280 | 579.6057 |
| 4020 | 572.8 | 0.8983 | 0.1568 | 36.2656 | 3.6581 | 0.6386 | 147.6827 | 19.0193 | 3.3204 | 767.8361 |
| 4021 | 648.6 | 1.2251 | 0.1889 | 52.0433 | 4.3607 | 0.6723 | 185.2464 | 19.1300 | 2.9494 | 812.6593 |
| 4022 | 751.3 | 1.2439 | 0.1656 | 49.4298 | 5.8761 | 0.7821 | 233.5029 | 22.3642 | 2.9767 | 888.7026 |
| 4023 | 529.4 | 0.8518 | 0.1609 | 36.2962 | 3.6455 | 0.6886 | 155.3392 | 18.0873 | 3.4166 | 770.7218 |
| 4024 | 597.9 | 1.1157 | 0.1866 | 53.0578 | 3.6858 | 0.6165 | 175.2806 | 18.0455 | 3.0181 | 858.1653 |
| 4025 | 579.4 | 1.0458 | 0.1805 | 44.7382 | 4.7872 | 0.8262 | 204.7912 | 17.6008 | 3.0378 | 752.9432 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Spleen | | | Kidneys | | | Liver | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | |
| 4026 | 605.2 | 1.0968 | 0.1812 | 48.4003 | 3.4408 | 0.5685 | 151.8380 | 15.6424 | 2.5847 | 690.2785 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Lungs w/ Trachea | | | Epididymis Right | | | Epididymis Left | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | |
| 1001 | 569.9 | 1.9059 | 0.3344 | 83.4603 | 0.7467 | 0.1310 | 32.6984 | 0.7995 | 0.1403 | 35.0105 |
| 1002 | 622.5 | 2.0844 | 0.3348 | 84.9978 | 0.9645 | 0.1549 | 39.3304 | 0.9412 | 0.1512 | 38.3803 |
| 1003 | 585.1 | 2.5489 | 0.4356 | 110.8555 | 0.7668 | 0.1311 | 33.3493 | 0.7199 | 0.1230 | 31.3095 |
| 1004 | 607.6 | 2.0861 | 0.3433 | 83.1679 | 0.7886 | 0.1298 | 31.4396 | 0.7426 | 0.1222 | 29.6057 |
| 1005 | 557.1 | 1.9139 | 0.3435 | 79.7492 | 0.7890 | 0.1416 | 32.8764 | 0.8249 | 0.1481 | 34.3723 |
| 1006 | 539.7 | 1.9804 | 0.3669 | 84.3154 | 0.8880 | 0.1645 | 37.8065 | 0.8344 | 0.1546 | 35.5245 |
| 1007 | 587.3 | 1.7881 | 0.3045 | 81.8053 | 0.7284 | 0.1240 | 33.3242 | 0.8201 | 0.1396 | 37.5194 |
| 1008 | 638.8 | 2.4040 | 0.3763 | 103.7952 | 0.8602 | 0.1347 | 37.1400 | 0.8196 | 0.1283 | 35.3871 |
| 1009 | 597.0 | 2.3581 | 0.3950 | 97.4180 | 0.7884 | 0.1321 | 32.5704 | 0.8410 | 0.1409 | 34.7435 |
| 1010 | 635.8 | 1.8862 | 0.2967 | 83.6601 | 0.7036 | 0.1107 | 31.2073 | 0.6810 | 0.1071 | 30.2049 |
| 1011 | 521.1 | 1.9012 | 0.3648 | 78.9830 | 0.7842 | 0.1505 | 32.5786 | 0.7609 | 0.1460 | 31.6107 |
| 1012 | 632.3 | 2.1140 | 0.3343 | 92.5002 | 0.8404 | 0.1329 | 36.7726 | 0.9535 | 0.1508 | 41.7214 |
| 1013 | 630.4 | 1.9097 | 0.3029 | 87.9398 | 0.7973 | 0.1265 | 36.7149 | 0.7998 | 0.1269 | 36.8300 |
| 1014 | 618.0 | 1.7934 | 0.2902 | 80.3531 | 0.9143 | 0.1479 | 40.9651 | 0.7764 | 0.1256 | 34.7865 |
| 1015 | 592.1 | 2.1861 | 0.3692 | 88.1919 | 0.9771 | 0.1650 | 39.4183 | 0.8661 | 0.1463 | 34.9403 |
| 1016 | 587.5 | 2.2471 | 0.3825 | 95.9889 | 0.7648 | 0.1302 | 32.6698 | 0.7716 | 0.1313 | 32.9603 |
| 1017 | 497.8 | 1.7405 | 0.3496 | 81.7366 | 0.8245 | 0.1656 | 38.7198 | 0.7681 | 0.1543 | 36.0712 |
| 1018 | 627.2 | 2.2747 | 0.3627 | 88.4581 | 0.9744 | 0.1554 | 37.8923 | 1.0622 | 0.1694 | 41.3066 |
| 1019 | 541.8 | 1.7004 | 0.3138 | 79.4171 | 0.7783 | 0.1437 | 36.3505 | 0.8094 | 0.1494 | 37.8030 |
| 1020 | 662.8 | 2.5336 | 0.3823 | 107.8311 | 1.0024 | 0.1512 | 42.6626 | 0.7847 | 0.1184 | 33.3972 |
| 1021 | 712.3 | 1.9876 | 0.2790 | 87.2903 | 0.8798 | 0.1235 | 38.6386 | 0.8657 | 0.1215 | 38.0193 |
| 1022 | 567.7 | 2.1073 | 0.3712 | 95.1592 | 0.7764 | 0.1368 | 35.0598 | 0.9445 | 0.1664 | 42.6507 |
| 1023 | 566.2 | 1.9570 | 0.3456 | 83.7112 | 0.8228 | 0.1453 | 35.1955 | 0.8898 | 0.1572 | 38.0614 |
| 1024 | 639.5 | 1.8730 | 0.2929 | 83.5378 | 0.8377 | 0.1310 | 37.3623 | 0.7980 | 0.1248 | 35.5916 |
| 1025 | 529.9 | 2.3461 | 0.4427 | 99.1547 | 0.7048 | 0.1330 | 29.7874 | 0.7749 | 0.1462 | 32.7501 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Lungs w/ Trachea | | | Epididymis Right | | | Epididymis Left | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | |
| 1026 | 577.6 | 1.9827 | 0.3433 | 90.2335 | 0.8395 | 0.1453 | 38.2060 | 0.8244 | 0.1427 | 37.5188 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Lungs w/ Trachea | | | Epididymis Right | | | Epididymis Left | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | |
| 2001 | 499.0 | 1.9785 | 0.3965 | 87.6334 | 0.6967 | 0.1396 | 30.8588 | 0.7405 | 0.1484 | 32.7989 |
| 2002 | 677.6 | 2.0951 | 0.3092 | 91.3216 | 0.8749 | 0.1291 | 38.1353 | 0.8671 | 0.1280 | 37.7953 |
| 2003 | 532.8 | 1.8211 | 0.3418 | 74.4796 | 0.7935 | 0.1489 | 32.4527 | 0.8331 | 0.1564 | 34.0722 |
| 2004 | 616.2 | 2.1710 | 0.3523 | 94.9777 | 0.8862 | 0.1438 | 38.7698 | 0.7893 | 0.1281 | 34.5306 |
| 2005 | 565.1 | 1.8072 | 0.3198 | 78.3559 | 0.7201 | 0.1274 | 31.2218 | 0.7561 | 0.1338 | 32.7827 |
| 2006 | 555.6 | 1.8950 | 0.3411 | 79.2754 | 0.7862 | 0.1415 | 32.8899 | 0.7028 | 0.1265 | 29.4009 |
| 2007 | 595.2 | 1.8069 | 0.3036 | 73.2102 | 0.8428 | 0.1416 | 34.1477 | 0.7918 | 0.1330 | 32.0814 |
| 2008 | 547.9 | 1.9664 | 0.3589 | 83.5415 | 0.7510 | 0.1371 | 31.9059 | 0.8522 | 0.1555 | 36.2053 |
| 2009 | 569.8 | 2.1888 | 0.3841 | 88.5401 | 0.7688 | 0.1349 | 31.0991 | 0.8009 | 0.1406 | 32.3976 |
| 2010 | 591.8 | 1.9454 | 0.3287 | 83.6300 | 0.6946 | 0.1174 | 29.8599 | 0.8111 | 0.1371 | 34.8680 |
| 2011 | 525.4 | 1.9624 | 0.3735 | 83.1279 | 0.6952 | 0.1323 | 29.4489 | 0.7032 | 0.1338 | 29.7878 |
| 2012 | 625.8 | 1.9530 | 0.3121 | 83.0887 | 0.8791 | 0.1405 | 37.4006 | 0.4676 | 0.0747 | 19.8936 |
| 2013 | 635.2 | 2.2313 | 0.3513 | 87.7083 | 0.9312 | 0.1466 | 36.6038 | 0.9405 | 0.1481 | 36.9693 |
| 2014 | 611.4 | 1.8733 | 0.3064 | 82.1911 | 0.6869 | 0.1123 | 30.1378 | 0.7335 | 0.1200 | 32.1823 |
| 2015 | 518.5 | 1.7075 | 0.3293 | 72.6287 | 0.7462 | 0.1439 | 31.7397 | 0.7673 | 0.1480 | 32.6372 |
| 2016 | 549.5 | 1.9724 | 0.3589 | 90.3444 | 0.6589 | 0.1199 | 30.1805 | 0.6981 | 0.1270 | 31.9760 |
| 2017 | 579.5 | 2.1016 | 0.3627 | 87.6324 | 0.6597 | 0.1138 | 27.5081 | 0.8256 | 0.1425 | 34.4258 |
| 2018 | 589.8 | 2.1086 | 0.3575 | 98.9349 | 0.7730 | 0.1311 | 36.2689 | 0.7373 | 0.1250 | 34.5939 |
| 2019 | 724.3 | 2.0594 | 0.2843 | 79.8310 | 0.9111 | 0.1258 | 35.3181 | 0.8698 | 0.1201 | 33.7171 |
| 2020 | 559.4 | 1.9704 | 0.3522 | 85.0447 | 0.7524 | 0.1345 | 32.4744 | 0.7961 | 0.1423 | 34.3606 |
| 2021 | 698.4 | 2.0162 | 0.2887 | 80.1447 | 0.7769 | 0.1112 | 30.8821 | 0.8217 | 0.1177 | 32.6629 |
| 2022 | 627.9 | 2.4822 | 0.3953 | 110.9661 | 0.7264 | 0.1157 | 32.4735 | 0.7603 | 0.1211 | 33.9890 |
| 2023 | 600.2 | 2.3919 | 0.3985 | 103.0192 | 0.8884 | 0.1480 | 38.2634 | 1.0385 | 0.1730 | 44.7282 |
| 2024 | 613.0 | 2.0992 | 0.3424 | 88.1980 | 0.8233 | 0.1343 | 34.5910 | 0.8401 | 0.1370 | 35.2968 |
| 2025 | 537.5 | 2.9109 | 0.5416 | 121.7746 | 0.8702 | 0.1619 | 36.4039 | 0.7519 | 0.1399 | 31.4550 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Lungs w/ Trachea | | | Epididymis Right | | | Epididymis Left | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | |
| 2026 | 492.3 | 2.0613 | 0.4187 | 90.1548 | 0.9284 | 0.1886 | 40.6053 | 0.8305 | 0.1687 | 36.3235 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Lungs w/ Trachea | | | Epididymis Right | | | Epididymis Left | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | |
| 3001 | 532.6 | 2.2589 | 0.4241 | 93.2466 | 0.9175 | 0.1723 | 37.8741 | 0.9741 | 0.1829 | 40.2105 |
| 3003 | 585.3 | 2.3007 | 0.3931 | 96.0145 | 0.6808 | 0.1163 | 28.4117 | 0.7998 | 0.1366 | 33.3778 |
| 3004 | 549.9 | 1.9370 | 0.3522 | 85.3755 | 0.8311 | 0.1511 | 36.6317 | 0.8745 | 0.1590 | 38.5446 |
| 3005 | 582.1 | 1.9427 | 0.3337 | 80.8919 | 0.7167 | 0.1231 | 29.8426 | 0.7783 | 0.1337 | 32.4076 |
| 3006 | 581.7 | 2.1145 | 0.3635 | 90.0170 | 0.8375 | 0.1440 | 35.6535 | 0.7947 | 0.1366 | 33.8314 |
| 3007 | 536.0 | 1.8329 | 0.3420 | 77.6093 | 0.7070 | 0.1319 | 29.9361 | 0.7094 | 0.1324 | 30.0377 |
| 3008 | 497.0 | 1.9104 | 0.3844 | 85.9882 | 0.7857 | 0.1581 | 35.3648 | 0.7755 | 0.1560 | 34.9057 |
| 3009 | 605.1 | 2.1573 | 0.3565 | 91.2911 | 0.8026 | 0.1326 | 33.9639 | 0.8078 | 0.1335 | 34.1839 |
| 3010 | 660.0 | 2.4076 | 0.3648 | 98.7652 | 0.8854 | 0.1342 | 36.3211 | 0.8254 | 0.1251 | 33.8598 |
| 3011 | 564.7 | 2.1941 | 0.3885 | 95.2631 | 0.7332 | 0.1298 | 31.8340 | 0.6993 | 0.1238 | 30.3621 |
| 3012 | 617.3 | 2.2937 | 0.3716 | 97.8791 | 0.7391 | 0.1197 | 31.5396 | 0.7817 | 0.1266 | 33.3575 |
| 3013 | 525.8 | 1.7173 | 0.3266 | 74.0056 | 0.8181 | 0.1556 | 35.2553 | 0.7533 | 0.1433 | 32.4628 |
| 3014 | 651.9 | 2.4023 | 0.3685 | 98.8235 | 0.7945 | 0.1219 | 32.6834 | 0.8332 | 0.1278 | 34.2754 |
| 3015 | 468.0 | 1.7948 | 0.3835 | 74.0124 | 0.7641 | 0.1633 | 31.5093 | 0.8105 | 0.1732 | 33.4227 |
| 3016 | 617.2 | 2.1548 | 0.3491 | 83.6134 | 0.8790 | 0.1424 | 34.1081 | 0.8762 | 0.1420 | 33.9995 |
| 3017 | 741.0 | 2.2005 | 0.2970 | 93.9100 | 0.7348 | 0.0992 | 31.3588 | 0.7978 | 0.1077 | 34.0475 |
| 3018 | 735.5 | 1.9705 | 0.2679 | 84.9061 | 0.7984 | 0.1086 | 34.4019 | 0.7990 | 0.1086 | 34.4278 |
| 3019 | 643.7 | 2.3232 | 0.3609 | 95.0184 | 0.9916 | 0.1540 | 40.5562 | 0.8271 | 0.1285 | 33.8282 |
| 3020 | 688.3 | 2.6761 | 0.3888 | 107.8725 | 0.8723 | 0.1267 | 35.1620 | 0.9440 | 0.1371 | 38.0522 |
| 3021 | 600.8 | 2.6774 | 0.4456 | 117.5845 | 1.0117 | 0.1684 | 44.4313 | 1.0776 | 0.1794 | 47.3254 |
| 3022 | 590.7 | 1.9196 | 0.3250 | 77.9755 | 0.7790 | 0.1319 | 31.6435 | 0.7975 | 0.1350 | 32.3950 |
| 3023 | 544.7 | 2.0079 | 0.3686 | 81.5590 | 0.8138 | 0.1494 | 33.0558 | 0.7609 | 0.1397 | 30.9070 |
| 3024 | 600.4 | 2.1197 | 0.3530 | 94.0793 | 0.9217 | 0.1535 | 40.9081 | 0.9292 | 0.1548 | 41.2410 |
| 3025 | 611.9 | 2.0554 | 0.3359 | 87.8076 | 0.8410 | 0.1374 | 35.9279 | 0.7991 | 0.1306 | 34.1379 |
| 3026 | 525.4 | 2.0454 | 0.3893 | 86.8130 | 0.8141 | 0.1549 | 34.5529 | 0.8425 | 0.1604 | 35.7582 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Lungs w/ Trachea | | | Epididymis Right | | | Epididymis Left | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | |
| 4001 | 549.1 | 1.7573 | 0.3200 | 79.0011 | 0.6594 | 0.1201 | 29.6439 | 0.6225 | 0.1134 | 27.9851 |
| 4002 | 593.0 | 1.8822 | 0.3174 | 81.0315 | 0.7631 | 0.1287 | 32.8526 | 0.7065 | 0.1191 | 30.4159 |
| 4003 | 639.1 | 2.3288 | 0.3644 | 99.2668 | 0.9369 | 0.1466 | 39.9361 | 0.9205 | 0.1440 | 39.2370 |
| 4004 | 564.1 | 1.8398 | 0.3261 | 81.1235 | 0.7803 | 0.1383 | 34.4063 | 0.8265 | 0.1465 | 36.4434 |
| 4005 | 561.5 | 2.0052 | 0.3571 | 81.4691 | 0.8952 | 0.1594 | 36.3710 | 0.8346 | 0.1486 | 33.9089 |
| 4006 | 539.4 | 1.9139 | 0.3548 | 80.3856 | 0.8558 | 0.1587 | 35.9444 | 0.8507 | 0.1577 | 35.7302 |
| 4007 | 520.6 | 2.0518 | 0.3941 | 91.9718 | 0.7373 | 0.1416 | 33.0494 | 0.7396 | 0.1421 | 33.1525 |
| 4008 | 566.5 | 2.2801 | 0.4025 | 98.1448 | 0.8831 | 0.1559 | 38.0122 | 0.9150 | 0.1615 | 39.3853 |
| 4009 | 696.1 | 2.0685 | 0.2972 | 89.6502 | 0.7068 | 0.1015 | 30.6332 | 0.7719 | 0.1109 | 33.4547 |
| 4010 | 594.7 | 1.9763 | 0.3323 | 85.5912 | 0.7514 | 0.1263 | 32.5422 | 0.7657 | 0.1288 | 33.1615 |
| 4011 | 775.0 | N | N | N | 0.9257 | 0.1194 | 38.5933 | 0.9655 | 0.1246 | 40.2526 |
| 4012 | 633.1 | 1.8637 | 0.2944 | 77.4927 | 0.7971 | 0.1259 | 33.1435 | 0.7206 | 0.1138 | 29.9626 |
| 4013 | 512.6 | 1.7352 | 0.3385 | 76.9831 | 0.6906 | 0.1347 | 30.6389 | 0.7013 | 0.1368 | 31.1136 |
| 4014 | 544.1 | 1.6638 | 0.3058 | 73.7991 | 0.7373 | 0.1355 | 32.7035 | 0.7629 | 0.1402 | 33.8390 |
| 4015 | 647.8 | 2.0447 | 0.3156 | 86.5701 | 0.7969 | 0.1230 | 33.7398 | 0.8763 | 0.1353 | 37.1015 |
| 4016 | 577.5 | 2.0090 | 0.3479 | 86.3975 | 0.7815 | 0.1353 | 33.6086 | 0.8282 | 0.1434 | 35.6169 |
| 4017 | 665.9 | 1.8779 | 0.2820 | 80.5896 | 0.7690 | 0.1155 | 33.0015 | 0.8019 | 0.1204 | 34.4134 |
| 4018 | 550.7 | 1.8401 | 0.3341 | 81.3520 | 0.8699 | 0.1580 | 38.4588 | 0.7931 | 0.1440 | 35.0634 |
| 4019 | 525.9 | 1.8872 | 0.3589 | 76.2443 | 0.8711 | 0.1656 | 35.1931 | 0.8944 | 0.1701 | 36.1345 |
| 4020 | 572.8 | 2.0019 | 0.3495 | 80.8195 | 0.7899 | 0.1379 | 31.8894 | 0.8231 | 0.1437 | 33.2297 |
| 4021 | 648.6 | 2.2262 | 0.3432 | 94.5709 | 0.8217 | 0.1267 | 34.9065 | 0.8634 | 0.1331 | 36.6780 |
| 4022 | 751.3 | 2.2107 | 0.2942 | 87.8482 | 1.0014 | 0.1333 | 39.7934 | 0.8599 | 0.1145 | 34.1705 |
| 4023 | 529.4 | 1.9866 | 0.3753 | 84.6514 | 0.8495 | 0.1605 | 36.1982 | 0.8936 | 0.1688 | 38.0774 |
| 4024 | 597.9 | 2.5145 | 0.4206 | 119.5787 | 0.7624 | 0.1275 | 36.2564 | 0.6925 | 0.1158 | 32.9323 |
| 4025 | 579.4 | 2.5800 | 0.4453 | 110.3696 | 0.8531 | 0.1472 | 36.4947 | 0.8431 | 0.1455 | 36.0669 |

N = Not taken

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Lungs w/ Trachea | | | Epididymis Right | | | Epididymis Left | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | |
| 4026 | 605.2 | 2.2752 | 0.3759 | 100.4016 | 0.7822 | 0.1292 | 34.5175 | 0.7054 | 0.1166 | 31.1284 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Prostate | | | Seminal Vesicles | | | Testis Right | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | |
| 1001 | 569.9 | 1.2048 | 0.2114 | 52.7588 | 1.6968 | 0.2977 | 74.3037 | 1.8120 | 0.3180 | 79.3484 |
| 1002 | 622.5 | 1.3086 | 0.2102 | 53.3621 | 2.7534 | 0.4423 | 112.2783 | 2.0571 | 0.3305 | 83.8845 |
| 1003 | 585.1 | 1.1926 | 0.2038 | 51.8680 | 2.6274 | 0.4491 | 114.2696 | 1.7985 | 0.3074 | 78.2195 |
| 1004 | 607.6 | 1.2497 | 0.2057 | 49.8226 | 1.4945 | 0.2460 | 59.5822 | 2.0729 | 0.3412 | 82.6416 |
| 1005 | 557.1 | 1.3062 | 0.2345 | 54.4273 | 2.5717 | 0.4616 | 107.1586 | 1.8831 | 0.3380 | 78.4658 |
| 1006 | 539.7 | 1.1447 | 0.2121 | 48.7355 | 2.3124 | 0.4285 | 98.4503 | 1.8677 | 0.3461 | 79.5172 |
| 1007 | 587.3 | 1.2925 | 0.2201 | 59.1317 | 2.1756 | 0.3704 | 99.5334 | 1.6691 | 0.2842 | 76.3611 |
| 1008 | 638.8 | 1.5177 | 0.2376 | 65.5283 | 2.2082 | 0.3457 | 95.3413 | 1.7838 | 0.2792 | 77.0174 |
| 1009 | 597.0 | 0.9894 | 0.1657 | 40.8742 | 2.0525 | 0.3438 | 84.7930 | 1.9380 | 0.3246 | 80.0628 |
| 1010 | 635.8 | 0.7519 | 0.1183 | 33.3496 | 2.3819 | 0.3746 | 105.6462 | 1.7510 | 0.2754 | 77.6634 |
| 1011 | 521.1 | 0.9234 | 0.1772 | 38.3615 | 2.1490 | 0.4124 | 89.2776 | 1.9994 | 0.3837 | 83.0626 |
| 1012 | 632.3 | 1.3611 | 0.2153 | 59.5563 | 1.7177 | 0.2717 | 75.1597 | 2.1575 | 0.3412 | 94.4036 |
| 1013 | 630.4 | 0.6449 | 0.1023 | 29.6970 | 2.8214 | 0.4476 | 129.9226 | 2.0563 | 0.3262 | 94.6906 |
| 1014 | 618.0 | 0.6478 | 0.1048 | 29.0246 | 3.4015 | 0.5504 | 152.4038 | 1.9809 | 0.3205 | 88.7540 |
| 1015 | 592.1 | 1.3135 | 0.2218 | 52.9893 | 2.2022 | 0.3719 | 88.8414 | 2.2288 | 0.3764 | 89.9145 |
| 1016 | 587.5 | 1.4071 | 0.2395 | 60.1068 | 1.5818 | 0.2692 | 67.5694 | 1.8370 | 0.3127 | 78.4707 |
| 1017 | 497.8 | 1.0043 | 0.2017 | 47.1635 | 1.6252 | 0.3265 | 76.3220 | 2.0115 | 0.4041 | 94.4632 |
| 1018 | 627.2 | 1.3037 | 0.2079 | 50.6980 | 2.5325 | 0.4038 | 98.4834 | 2.4027 | 0.3831 | 93.4357 |
| 1019 | 541.8 | 1.0690 | 0.1973 | 49.9276 | 2.0997 | 0.3875 | 98.0664 | 2.0774 | 0.3834 | 97.0249 |
| 1020 | 662.8 | 1.7849 | 0.2693 | 75.9661 | 1.6564 | 0.2499 | 70.4971 | 2.0845 | 0.3145 | 88.7172 |
| 1021 | 712.3 | 0.6521 | 0.0915 | 28.6386 | 3.1412 | 0.4410 | 137.9534 | 2.1387 | 0.3003 | 93.9262 |
| 1022 | 567.7 | 1.3895 | 0.2448 | 62.7455 | 2.9905 | 0.5268 | 135.0418 | 1.9517 | 0.3438 | 88.1328 |
| 1023 | 566.2 | 1.5454 | 0.2729 | 66.1049 | 1.9841 | 0.3504 | 84.8704 | 2.1597 | 0.3814 | 92.3817 |
| 1024 | 639.5 | 1.2685 | 0.1984 | 56.5764 | 2.6332 | 0.4118 | 117.4435 | 2.0066 | 0.3138 | 89.4965 |
| 1025 | 529.9 | 1.1965 | 0.2258 | 50.5684 | 1.7611 | 0.3323 | 74.4305 | 1.9725 | 0.3722 | 83.3650 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Prostate | | | Seminal Vesicles | | | Testis Right | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | |
| 1026 | 577.6 | 1.2967 | 0.2245 | 59.0133 | 2.5352 | 0.4389 | 115.3780 | 2.0030 | 0.3468 | 91.1573 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Prostate | | | Seminal Vesicles | | | Testis Right | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | |
| 2001 | 499.0 | 1.2676 | 0.2540 | 56.1456 | 2.4459 | 0.4902 | 108.3359 | 1.6662 | 0.3339 | 73.8008 |
| 2002 | 677.6 | 1.4728 | 0.2174 | 64.1967 | 2.4873 | 0.3671 | 108.4169 | 2.1367 | 0.3153 | 93.1349 |
| 2003 | 532.8 | 1.0780 | 0.2023 | 44.0882 | 1.9629 | 0.3684 | 80.2789 | 1.9132 | 0.3591 | 78.2463 |
| 2004 | 616.2 | 0.9945 | 0.1614 | 43.5077 | 1.5935 | 0.2586 | 69.7130 | 2.1067 | 0.3419 | 92.1647 |
| 2005 | 565.1 | 0.8712 | 0.1542 | 37.7732 | 2.3951 | 0.4238 | 103.8458 | 1.8829 | 0.3332 | 81.6381 |
| 2006 | 555.6 | 1.1515 | 0.2073 | 48.1719 | 1.9893 | 0.3580 | 83.2204 | 1.8710 | 0.3368 | 78.2714 |
| 2007 | 595.2 | 1.2981 | 0.2181 | 52.5951 | 2.8605 | 0.4806 | 115.8989 | 1.9182 | 0.3223 | 77.7197 |
| 2008 | 547.9 | 1.5088 | 0.2754 | 64.1006 | 2.1846 | 0.3987 | 92.8116 | 1.9813 | 0.3616 | 84.1745 |
| 2009 | 569.8 | 0.9747 | 0.1711 | 39.4280 | 2.1369 | 0.3750 | 86.4407 | 2.0309 | 0.3564 | 82.1528 |
| 2010 | 591.8 | 1.9481 | 0.3292 | 83.7460 | 2.0149 | 0.3405 | 86.6177 | 1.9430 | 0.3283 | 83.5268 |
| 2011 | 525.4 | 0.9888 | 0.1882 | 41.8859 | 1.9543 | 0.3720 | 82.7848 | 1.9029 | 0.3622 | 80.6074 |
| 2012 | 625.8 | 0.9889 | 0.1580 | 42.0719 | 1.8529 | 0.2961 | 78.8300 | 2.3035 | 0.3681 | 98.0004 |
| 2013 | 635.2 | 1.4797 | 0.2330 | 58.1643 | 2.0066 | 0.3159 | 78.8758 | 2.1497 | 0.3384 | 84.5008 |
| 2014 | 611.4 | 1.0854 | 0.1775 | 47.6220 | 1.9709 | 0.3224 | 86.4733 | 1.8712 | 0.3061 | 82.0990 |
| 2015 | 518.5 | 0.8306 | 0.1602 | 35.3296 | 2.0632 | 0.3979 | 87.7584 | 1.9542 | 0.3769 | 83.1221 |
| 2016 | 549.5 | 1.3024 | 0.2370 | 59.6556 | 1.9610 | 0.3569 | 89.8223 | 1.7371 | 0.3161 | 79.5667 |
| 2017 | 579.5 | 0.9867 | 0.1703 | 41.1434 | 2.4765 | 0.4274 | 103.2649 | 1.9337 | 0.3337 | 80.6313 |
| 2018 | 589.8 | 1.7784 | 0.3015 | 83.4420 | 2.3065 | 0.3911 | 108.2203 | 1.9423 | 0.3293 | 91.1322 |
| 2019 | 724.3 | 1.4965 | 0.2066 | 58.0106 | 2.1505 | 0.2969 | 83.3624 | 2.1845 | 0.3016 | 84.6804 |
| 2020 | 559.4 | 1.0081 | 0.1802 | 43.5107 | 2.2135 | 0.3957 | 95.5371 | 2.0495 | 0.3664 | 88.4587 |
| 2021 | 698.4 | 1.4491 | 0.2075 | 57.6023 | 2.6618 | 0.3811 | 105.8075 | 2.1443 | 0.3070 | 85.2367 |
| 2022 | 627.9 | 1.0167 | 0.1619 | 45.4513 | 2.1105 | 0.3361 | 94.3493 | 1.8660 | 0.2972 | 83.4190 |
| 2023 | 600.2 | 1.9845 | 0.3306 | 85.4725 | 2.2839 | 0.3805 | 98.3676 | 2.3964 | 0.3993 | 103.2130 |
| 2024 | 613.0 | 1.6022 | 0.2614 | 67.3165 | 2.4605 | 0.4014 | 103.3780 | 2.0475 | 0.3340 | 86.0258 |
| 2025 | 537.5 | 0.8458 | 0.1574 | 35.3832 | 2.0259 | 0.3769 | 84.7515 | 1.8490 | 0.3440 | 77.3511 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Prostate | | | Seminal Vesicles | | | Testis Right | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | |
| 2026 | 492.3 | 1.9806 | 0.4023 | 86.6253 | 2.0056 | 0.4074 | 87.7187 | 2.0519 | 0.4168 | 89.7437 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Prostate | | | Seminal Vesicles | | | Testis Right | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | |
| 3001 | 532.6 | 1.1161 | 0.2096 | 46.0722 | 1.8793 | 0.3529 | 77.5769 | 2.1616 | 0.4059 | 89.2301 |
| 3003 | 585.3 | 1.6096 | 0.2750 | 67.1730 | 2.2107 | 0.3777 | 92.2586 | 1.8988 | 0.3244 | 79.2421 |
| 3004 | 549.9 | 1.7072 | 0.3105 | 75.2468 | 2.5717 | 0.4677 | 113.3507 | 2.0254 | 0.3683 | 89.2719 |
| 3005 | 582.1 | 1.2633 | 0.2170 | 52.6024 | 2.2539 | 0.3872 | 93.8499 | 1.9606 | 0.3368 | 81.6372 |
| 3006 | 581.7 | 1.1956 | 0.2055 | 50.8983 | 2.1209 | 0.3646 | 90.2895 | 1.9187 | 0.3298 | 81.6816 |
| 3007 | 536.0 | 1.1728 | 0.2188 | 49.6591 | 1.9017 | 0.3548 | 80.5225 | 1.7461 | 0.3258 | 73.9340 |
| 3008 | 497.0 | 1.7774 | 0.3576 | 80.0018 | 2.0164 | 0.4057 | 90.7593 | 1.7764 | 0.3574 | 79.9568 |
| 3009 | 605.1 | 1.2838 | 0.2122 | 54.3269 | 2.7708 | 0.4579 | 117.2528 | 1.9977 | 0.3301 | 84.5373 |
| 3010 | 660.0 | 0.8243 | 0.1249 | 33.8147 | 1.9778 | 0.2997 | 81.1339 | 2.3949 | 0.3629 | 98.2442 |
| 3011 | 564.7 | 1.5012 | 0.2658 | 65.1789 | 2.4927 | 0.4414 | 108.2277 | 2.1867 | 0.3872 | 94.9418 |
| 3012 | 617.3 | 1.9280 | 0.3123 | 82.2736 | 1.8024 | 0.2920 | 76.9139 | 2.1099 | 0.3418 | 90.0358 |
| 3013 | 525.8 | 1.0513 | 0.1999 | 45.3049 | 2.1038 | 0.4001 | 90.6615 | 2.0343 | 0.3869 | 87.6665 |
| 3014 | 651.9 | 1.6605 | 0.2547 | 68.3080 | 2.2617 | 0.3469 | 93.0396 | 1.8580 | 0.2850 | 76.4326 |
| 3015 | 468.0 | 0.9049 | 0.1934 | 37.3155 | 2.0755 | 0.4435 | 85.5876 | 1.7701 | 0.3782 | 72.9938 |
| 3016 | 617.2 | 0.7660 | 0.1241 | 29.7233 | 2.7257 | 0.4416 | 105.7662 | 2.0545 | 0.3329 | 79.7214 |
| 3017 | 741.0 | 1.3573 | 0.1832 | 57.9251 | 2.0015 | 0.2701 | 85.4174 | 1.9178 | 0.2588 | 81.8453 |
| 3018 | 735.5 | 0.5893 | 0.0801 | 25.3921 | 2.8379 | 0.3858 | 122.2811 | 1.9763 | 0.2687 | 85.1560 |
| 3019 | 643.7 | 1.7423 | 0.2707 | 71.2597 | 2.5274 | 0.3926 | 103.3701 | 2.2508 | 0.3497 | 92.0573 |
| 3020 | 688.3 | 1.5425 | 0.2241 | 62.1775 | 2.0033 | 0.2911 | 80.7522 | 2.2080 | 0.3208 | 89.0035 |
| 3021 | 600.8 | 1.7705 | 0.2947 | 77.7558 | 2.4462 | 0.4072 | 107.4308 | 2.2009 | 0.3663 | 96.6579 |
| 3022 | 590.7 | 1.0889 | 0.1843 | 44.2319 | 2.1235 | 0.3595 | 86.2580 | 2.2058 | 0.3734 | 89.6011 |
| 3023 | 544.7 | 1.1744 | 0.2156 | 47.7030 | 2.3651 | 0.4342 | 96.0681 | 2.1276 | 0.3906 | 86.4211 |
| 3024 | 600.4 | 1.1289 | 0.1880 | 50.1043 | 1.9126 | 0.3186 | 84.8875 | 1.9816 | 0.3300 | 87.9499 |
| 3025 | 611.9 | 1.2274 | 0.2006 | 52.4351 | 2.4217 | 0.3958 | 103.4561 | 1.8829 | 0.3077 | 80.4383 |
| 3026 | 525.4 | 1.1875 | 0.2260 | 50.4011 | 2.2695 | 0.4320 | 96.3244 | 1.9625 | 0.3735 | 83.2944 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Prostate | | | Seminal Vesicles | | | Testis Right | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | |
| 4001 | 549.1 | 0.7276 | 0.1325 | 32.7099 | 2.4304 | 0.4426 | 109.2609 | 1.7590 | 0.3203 | 79.0775 |
| 4002 | 593.0 | 1.0235 | 0.1726 | 44.0632 | 1.8860 | 0.3180 | 81.1951 | 1.9447 | 0.3279 | 83.7222 |
| 4003 | 639.1 | 1.5877 | 0.2484 | 67.6769 | 2.5864 | 0.4047 | 110.2472 | 2.2615 | 0.3539 | 96.3981 |
| 4004 | 564.1 | 1.1506 | 0.2040 | 50.7342 | 2.1482 | 0.3808 | 94.7220 | 1.8168 | 0.3221 | 80.1094 |
| 4005 | 561.5 | 1.4449 | 0.2573 | 58.7047 | 2.2124 | 0.3940 | 89.8875 | 2.1422 | 0.3815 | 87.0353 |
| 4006 | 539.4 | 1.3160 | 0.2440 | 55.2732 | 2.3897 | 0.4430 | 100.3696 | 2.2120 | 0.4101 | 92.9060 |
| 4007 | 520.6 | 0.8516 | 0.1636 | 38.1729 | 2.4378 | 0.4683 | 109.2743 | 1.9061 | 0.3661 | 85.4409 |
| 4008 | 566.5 | 1.8476 | 0.3261 | 79.5282 | 2.2611 | 0.3991 | 97.3270 | 2.1805 | 0.3849 | 93.8576 |
| 4009 | 696.1 | 1.1040 | 0.1586 | 47.8481 | 2.0895 | 0.3002 | 90.5604 | 2.0378 | 0.2927 | 88.3197 |
| 4010 | 594.7 | 1.2242 | 0.2059 | 53.0186 | 2.2120 | 0.3720 | 95.7990 | 1.9336 | 0.3251 | 83.7419 |
| 4011 | 775.0 | 0.6038 | 0.0779 | 25.1730 | 3.2033 | 0.4133 | 133.5487 | 2.2078 | 0.2849 | 92.0454 |
| 4012 | 633.1 | 1.1345 | 0.1792 | 47.1726 | 2.0906 | 0.3302 | 86.9272 | 2.1919 | 0.3462 | 91.1393 |
| 4013 | 512.6 | 1.0147 | 0.1980 | 45.0177 | 1.9937 | 0.3889 | 88.4516 | 1.8651 | 0.3639 | 82.7462 |
| 4014 | 544.1 | 1.0254 | 0.1885 | 45.4824 | 2.3920 | 0.4396 | 106.0989 | 2.0371 | 0.3744 | 90.3571 |
| 4015 | 647.8 | 1.2032 | 0.1857 | 50.9420 | 2.2477 | 0.3470 | 95.1649 | 2.1669 | 0.3345 | 91.7439 |
| 4016 | 577.5 | 1.3342 | 0.2310 | 57.3775 | 2.5332 | 0.4386 | 108.9408 | 1.9793 | 0.3427 | 85.1202 |
| 4017 | 665.9 | 1.2603 | 0.1893 | 54.0855 | 2.5312 | 0.3801 | 108.6259 | 1.7854 | 0.2681 | 76.6200 |
| 4018 | 550.7 | 1.0364 | 0.1882 | 45.8199 | 3.2666 | 0.5932 | 144.4184 | 1.8478 | 0.3355 | 81.6924 |
| 4019 | 525.9 | 1.3374 | 0.2543 | 54.0320 | 2.8639 | 0.5446 | 115.7038 | 2.0078 | 0.3818 | 81.1167 |
| 4020 | 572.8 | 0.7204 | 0.1258 | 29.0836 | 3.1016 | 0.5415 | 125.2160 | 1.9025 | 0.3321 | 76.8066 |
| 4021 | 648.6 | 1.2290 | 0.1895 | 52.2090 | 2.4715 | 0.3811 | 104.9915 | 2.1480 | 0.3312 | 91.2489 |
| 4022 | 751.3 | 1.2978 | 0.1727 | 51.5716 | 2.2235 | 0.2960 | 88.3568 | 2.4583 | 0.3272 | 97.6873 |
| 4023 | 529.4 | 0.9694 | 0.1831 | 41.3073 | 2.1082 | 0.3982 | 89.8330 | 1.8912 | 0.3572 | 80.5863 |
| 4024 | 597.9 | 1.1288 | 0.1888 | 53.6808 | 1.9949 | 0.3337 | 94.8687 | 1.4091 | 0.2357 | 67.0107 |
| 4025 | 579.4 | 1.9217 | 0.3317 | 82.2082 | 1.9457 | 0.3358 | 83.2349 | 1.8342 | 0.3166 | 78.4651 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Prostate | | | Seminal Vesicles | | | Testis Right | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | |
| 4026 | 605.2 | 0.9768 | 0.1614 | 43.1049 | 2.0634 | 0.3409 | 91.0551 | 1.8431 | 0.3045 | 81.3336 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Testis Left | | |
|---|---|---|---|---|
| | | (g) | %Body | %Brain |
| Group 1 - 0 mg/m$^3$ | | | | |
| 1001 | 569.9 | 1.8896 | 0.3316 | 82.7465 |
| 1002 | 622.5 | 2.0720 | 0.3329 | 84.4921 |
| 1003 | 585.1 | 1.8109 | 0.3095 | 78.7588 |
| 1004 | 607.6 | 2.0168 | 0.3319 | 80.4051 |
| 1005 | 557.1 | 1.9226 | 0.3451 | 80.1117 |
| 1006 | 539.7 | 1.8095 | 0.3353 | 77.0393 |
| 1007 | 587.3 | 1.6027 | 0.2729 | 73.3233 |
| 1008 | 638.8 | 1.7252 | 0.2701 | 74.4873 |
| 1009 | 597.0 | 1.9758 | 0.3310 | 81.6244 |
| 1010 | 635.8 | 1.8487 | 0.2908 | 81.9968 |
| 1011 | 521.1 | 2.0266 | 0.3889 | 84.1926 |
| 1012 | 632.3 | 2.2094 | 0.3494 | 96.6745 |
| 1013 | 630.4 | 2.0801 | 0.3300 | 95.7865 |
| 1014 | 618.0 | 1.9831 | 0.3209 | 88.8525 |
| 1015 | 592.1 | 2.2043 | 0.3723 | 88.9261 |
| 1016 | 587.5 | 1.8072 | 0.3076 | 77.1978 |
| 1017 | 497.8 | 2.0007 | 0.4019 | 93.9560 |
| 1018 | 627.2 | 2.4694 | 0.3937 | 96.0296 |
| 1019 | 541.8 | 2.0108 | 0.3711 | 93.9143 |
| 1020 | 662.8 | 1.9837 | 0.2993 | 84.4271 |
| 1021 | 712.3 | 2.1570 | 0.3028 | 94.7299 |
| 1022 | 567.7 | 2.0071 | 0.3535 | 90.6345 |
| 1023 | 566.2 | 2.1274 | 0.3757 | 91.0001 |
| 1024 | 639.5 | 1.9841 | 0.3103 | 88.4929 |
| 1025 | 529.9 | 2.0293 | 0.3830 | 85.7656 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Testis Left | | |
|---|---|---|---|---|
| | | (g) | %Body | %Brain |
| Group 1 - 0 mg/m$^3$ | | | | |
| 1026 | 577.6 | 1.9394 | 0.3358 | 88.2629 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Testis Left | | |
|---|---|---|---|---|
| | | (g) | %Body | %Brain |
| Group 2 - 2,000 mg/m$^3$ | | | | |
| 2001 | 499.0 | 1.6298 | 0.3266 | 72.1885 |
| 2002 | 677.6 | 2.0298 | 0.2996 | 88.4753 |
| 2003 | 532.8 | 1.9564 | 0.3672 | 80.0131 |
| 2004 | 616.2 | 2.1331 | 0.3462 | 93.3196 |
| 2005 | 565.1 | 1.8992 | 0.3361 | 82.3448 |
| 2006 | 555.6 | 1.7258 | 0.3106 | 72.1971 |
| 2007 | 595.2 | 1.9551 | 0.3285 | 79.2148 |
| 2008 | 547.9 | 2.0585 | 0.3757 | 87.4543 |
| 2009 | 569.8 | 2.0251 | 0.3554 | 81.9182 |
| 2010 | 591.8 | 1.9969 | 0.3374 | 85.8439 |
| 2011 | 525.4 | 1.8748 | 0.3568 | 79.4171 |
| 2012 | 625.8 | 1.3172 | 0.2105 | 56.0391 |
| 2013 | 635.2 | 2.0570 | 0.3238 | 80.8569 |
| 2014 | 611.4 | 1.8548 | 0.3034 | 81.3794 |
| 2015 | 518.5 | 1.9703 | 0.3800 | 83.8069 |
| 2016 | 549.5 | 1.7685 | 0.3218 | 81.0049 |
| 2017 | 579.5 | 1.9508 | 0.3366 | 81.3443 |
| 2018 | 589.8 | 1.9504 | 0.3307 | 91.5122 |
| 2019 | 724.3 | 2.2060 | 0.3046 | 85.5138 |
| 2020 | 559.4 | 2.0084 | 0.3590 | 86.6848 |
| 2021 | 698.4 | 2.1210 | 0.3037 | 84.3105 |
| 2022 | 627.9 | 1.8978 | 0.3022 | 84.8406 |
| 2023 | 600.2 | 2.4841 | 0.4139 | 106.9903 |
| 2024 | 613.0 | 1.9876 | 0.3242 | 83.5091 |
| 2025 | 537.5 | 1.8213 | 0.3388 | 76.1923 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Testis Left | | |
|---|---|---|---|---|
| | | (g) | %Body | %Brain |
| Group 2 - 2,000 mg/m$^3$ | | | | |
| 2026 | 492.3 | 2.0705 | 0.4206 | 90.5572 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Testis Left | | |
|---|---|---|---|---|
| | | (g) | %Body | %Brain |
| Group 3 - 10,000 mg/m$^3$ | | | | |
| 3001 | 532.6 | 2.2376 | 0.4201 | 92.3674 |
| 3003 | 585.3 | 2.0110 | 0.3436 | 83.9245 |
| 3004 | 549.9 | 2.0300 | 0.3692 | 89.4746 |
| 3005 | 582.1 | 2.0400 | 0.3505 | 84.9434 |
| 3006 | 581.7 | 1.9328 | 0.3323 | 82.2818 |
| 3007 | 536.0 | 1.7942 | 0.3347 | 75.9707 |
| 3008 | 497.0 | 1.8464 | 0.3715 | 83.1075 |
| 3009 | 605.1 | 1.9432 | 0.3211 | 82.2310 |
| 3010 | 660.0 | 2.3047 | 0.3492 | 94.5440 |
| 3011 | 564.7 | 2.1120 | 0.3740 | 91.6985 |
| 3012 | 617.3 | 2.0402 | 0.3305 | 87.0615 |
| 3013 | 525.8 | 2.0139 | 0.3830 | 86.7873 |
| 3014 | 651.9 | 1.8557 | 0.2847 | 76.3380 |
| 3015 | 468.0 | 1.7414 | 0.3721 | 71.8103 |
| 3016 | 617.2 | 2.2181 | 0.3594 | 86.0696 |
| 3017 | 741.0 | 1.8697 | 0.2523 | 79.7926 |
| 3018 | 735.5 | 2.0362 | 0.2768 | 87.7370 |
| 3019 | 643.7 | 2.2280 | 0.3461 | 91.1247 |
| 3020 | 688.3 | 2.2605 | 0.3284 | 91.1198 |
| 3021 | 600.8 | 2.2548 | 0.3753 | 99.0250 |
| 3022 | 590.7 | 2.1339 | 0.3612 | 86.6805 |
| 3023 | 544.7 | 2.0122 | 0.3694 | 81.7336 |
| 3024 | 600.4 | 1.9881 | 0.3311 | 88.2384 |
| 3025 | 611.9 | 1.8535 | 0.3029 | 79.1823 |
| 3026 | 525.4 | 1.9258 | 0.3665 | 81.7368 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Testis Left | | |
|---|---|---|---|---|
| | | (g) | %Body | %Brain |
| Group 4 - 20,000 mg/m$^3$ | | | | |
| 4001 | 549.1 | 1.8661 | 0.3398 | 83.8923 |
| 4002 | 593.0 | 1.8983 | 0.3201 | 81.7246 |
| 4003 | 639.1 | 2.3503 | 0.3678 | 100.1833 |
| 4004 | 564.1 | 1.7120 | 0.3035 | 75.4883 |
| 4005 | 561.5 | 2.1535 | 0.3835 | 87.4944 |
| 4006 | 539.4 | 2.2562 | 0.4183 | 94.7625 |
| 4007 | 520.6 | 1.9207 | 0.3689 | 86.0953 |
| 4008 | 566.5 | 2.1720 | 0.3834 | 93.4917 |
| 4009 | 696.1 | 2.0168 | 0.2897 | 87.4095 |
| 4010 | 594.7 | 1.9088 | 0.3210 | 82.6678 |
| 4011 | 775.0 | 2.2982 | 0.2965 | 95.8142 |
| 4012 | 633.1 | 2.0995 | 0.3316 | 87.2973 |
| 4013 | 512.6 | 1.8821 | 0.3672 | 83.5004 |
| 4014 | 544.1 | 2.0566 | 0.3780 | 91.2220 |
| 4015 | 647.8 | 2.1686 | 0.3348 | 91.8159 |
| 4016 | 577.5 | 1.9230 | 0.3330 | 82.6990 |
| 4017 | 665.9 | 1.8347 | 0.2755 | 78.7357 |
| 4018 | 550.7 | 1.8017 | 0.3272 | 79.6543 |
| 4019 | 525.9 | 2.0692 | 0.3935 | 83.5973 |
| 4020 | 572.8 | 1.7998 | 0.3142 | 72.6605 |
| 4021 | 648.6 | 2.1399 | 0.3299 | 90.9048 |
| 4022 | 751.3 | 2.2993 | 0.3060 | 91.3690 |
| 4023 | 529.4 | 1.8502 | 0.3495 | 78.8393 |
| 4024 | 597.9 | 1.4005 | 0.2342 | 66.6017 |
| 4025 | 579.4 | 1.8190 | 0.3139 | 77.8149 |

| Males | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Testis Left | | |
|---|---|---|---|---|
| | | (g) | %Body | %Brain |
| Group 4 - 20,000 mg/m$^3$ | | | | |
| 4026 | 605.2 | 1.9329 | 0.3194 | 85.2963 |

| Females | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Brain | | | Pituitary | | | Adrenal Glands | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | |
| 1501 | 286.5 | 2.1058 | 0.7350 | 100.0000 | 0.0172 | 0.0060 | 0.8168 | 0.0721 | 0.0252 | 3.4239 |
| 1502 | 282.2 | 2.0731 | 0.7346 | 100.0000 | 0.0128 | 0.0045 | 0.6174 | 0.0558 | 0.0198 | 2.6916 |
| 1503 | 276.1 | 1.8682 | 0.6766 | 100.0000 | 0.0153 | 0.0055 | 0.8190 | 0.0546 | 0.0198 | 2.9226 |
| 1505 | 316.2 | 1.9220 | 0.6078 | 100.0000 | 0.0149 | 0.0047 | 0.7752 | 0.0581 | 0.0184 | 3.0229 |
| 1506 | 291.8 | 2.1065 | 0.7219 | 100.0000 | 0.0167 | 0.0057 | 0.7928 | 0.0476 | 0.0163 | 2.2597 |
| 1507 | 315.6 | 2.0511 | 0.6499 | 100.0000 | 0.0156 | 0.0049 | 0.7606 | 0.0805 | 0.0255 | 3.9247 |
| 1508 | 309.0 | 1.9855 | 0.6426 | 100.0000 | 0.0160 | 0.0052 | 0.8058 | 0.0775 | 0.0251 | 3.9033 |
| 1510 | 312.5 | 2.0124 | 0.6440 | 100.0000 | 0.0184 | 0.0059 | 0.9143 | 0.0669 | 0.0214 | 3.3244 |
| 1511 | 282.2 | 2.0563 | 0.7287 | 100.0000 | 0.0158 | 0.0056 | 0.7684 | 0.0752 | 0.0266 | 3.6571 |
| 1514 | 338.3 | 2.0774 | 0.6141 | 100.0000 | 0.0144 | 0.0043 | 0.6932 | 0.0491 | 0.0145 | 2.3635 |
| 1515 | 274.2 | 1.8977 | 0.6921 | 100.0000 | 0.0138 | 0.0050 | 0.7272 | 0.0597 | 0.0218 | 3.1459 |
| 1516 | 294.0 | 2.1239 | 0.7224 | 100.0000 | 0.0096 | 0.0033 | 0.4520 | 0.0582 | 0.0198 | 2.7402 |
| 1517 | 299.7 | 2.0191 | 0.6737 | 100.0000 | 0.0168 | 0.0056 | 0.8321 | 0.0504 | 0.0168 | 2.4962 |
| 1518 | 310.0 | 1.9496 | 0.6289 | 100.0000 | 0.0170 | 0.0055 | 0.8720 | 0.0975 | 0.0315 | 5.0010 |
| 1519 | 303.7 | 2.2277 | 0.7335 | 100.0000 | 0.0157 | 0.0052 | 0.7048 | 0.0643 | 0.0212 | 2.8864 |
| 1520 | 316.9 | 2.1430 | 0.6762 | 100.0000 | 0.0103 | 0.0033 | 0.4806 | 0.1026 | 0.0324 | 4.7877 |
| 1523 | 307.3 | 2.1109 | 0.6869 | 100.0000 | 0.0212 | 0.0069 | 1.0043 | 0.0633 | 0.0206 | 2.9987 |
| 1525 | 320.3 | 2.1041 | 0.6569 | 100.0000 | 0.0129 | 0.0040 | 0.6131 | 0.0659 | 0.0206 | 3.1320 |
| 1526 | 312.8 | 2.0381 | 0.6516 | 100.0000 | 0.0147 | 0.0047 | 0.7213 | 0.0728 | 0.0233 | 3.5720 |

| Females | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Brain | | | Pituitary | | | Adrenal Glands | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | |
| 2501 | 305.1 | 2.1222 | 0.6956 | 100.0000 | 0.0142 | 0.0047 | 0.6691 | 0.0596 | 0.0195 | 2.8084 |
| 2502 | 302.3 | 2.0053 | 0.6633 | 100.0000 | 0.0161 | 0.0053 | 0.8029 | 0.0598 | 0.0198 | 2.9821 |
| 2503 | 283.8 | 1.9410 | 0.6839 | 100.0000 | 0.0158 | 0.0056 | 0.8140 | 0.0440 | 0.0155 | 2.2669 |
| 2504 | 340.9 | 2.1990 | 0.6451 | 100.0000 | | | | 0.0551 | 0.0162 | 2.5057 |
| 2507 | 293.6 | 2.0165 | 0.6868 | 100.0000 | 0.0157 | 0.0053 | 0.7786 | 0.0627 | 0.0214 | 3.1093 |
| 2509 | 313.3 | 2.1510 | 0.6866 | 100.0000 | 0.0143 | 0.0046 | 0.6648 | 0.0643 | 0.0205 | 2.9893 |
| 2510 | 301.9 | 1.9414 | 0.6431 | 100.0000 | 0.0132 | 0.0044 | 0.6799 | 0.0669 | 0.0222 | 3.4460 |
| 2512 | 281.5 | 2.0437 | 0.7260 | 100.0000 | 0.0134 | 0.0048 | 0.6557 | 0.0543 | 0.0193 | 2.6569 |
| 2513 | 317.3 | 1.9659 | 0.6196 | 100.0000 | 0.0174 | 0.0055 | 0.8851 | 0.0610 | 0.0192 | 3.1029 |
| 2514 | 300.6 | 2.1342 | 0.7100 | 100.0000 | 0.0141 | 0.0047 | 0.6607 | 0.0598 | 0.0199 | 2.8020 |
| 2515 | 317.2 | 2.0790 | 0.6554 | 100.0000 | 0.0154 | 0.0049 | 0.7407 | 0.0561 | 0.0177 | 2.6984 |
| 2517 | 280.0 | 1.9715 | 0.7041 | 100.0000 | 0.0128 | 0.0046 | 0.6493 | 0.0533 | 0.0190 | 2.7035 |
| 2518 | 287.4 | 2.0823 | 0.7245 | 100.0000 | 0.0157 | 0.0055 | 0.7540 | 0.0674 | 0.0235 | 3.2368 |
| 2519 | 282.7 | 2.0198 | 0.7145 | 100.0000 | 0.0132 | 0.0047 | 0.6535 | 0.0445 | 0.0157 | 2.2032 |
| 2520 | 296.9 | 1.9040 | 0.6413 | 100.0000 | 0.0128 | 0.0043 | 0.6723 | 0.0680 | 0.0229 | 3.5714 |
| 2521 | 314.4 | 1.9147 | 0.6090 | 100.0000 | 0.0164 | 0.0052 | 0.8565 | 0.0939 | 0.0299 | 4.9042 |
| 2522 | 331.0 | 2.0642 | 0.6236 | 100.0000 | 0.0159 | 0.0048 | 0.7703 | 0.0677 | 0.0205 | 3.2797 |
| 2523 | 276.3 | 2.0776 | 0.7519 | 100.0000 | 0.0114 | 0.0041 | 0.5487 | 0.0452 | 0.0164 | 2.1756 |
| 2524 | 301.3 | 2.1277 | 0.7062 | 100.0000 | 0.0148 | 0.0049 | 0.6956 | 0.0745 | 0.0247 | 3.5014 |

| Females | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Brain | | | Pituitary | | | Adrenal Glands | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | |
| 3501 | 314.3 | 2.0065 | 0.6384 | 100.0000 | 0.0168 | 0.0053 | 0.8373 | 0.0461 | 0.0147 | 2.2975 |
| 3503 | 272.6 | 1.9576 | 0.7181 | 100.0000 | 0.0153 | 0.0056 | 0.7816 | 0.0834 | 0.0306 | 4.2603 |
| 3505 | 324.4 | 2.1787 | 0.6716 | 100.0000 | 0.0136 | 0.0042 | 0.6242 | 0.0515 | 0.0159 | 2.3638 |
| 3506 | 307.5 | 2.0786 | 0.6760 | 100.0000 | 0.0164 | 0.0053 | 0.7890 | 0.0602 | 0.0196 | 2.8962 |
| 3507 | 304.9 | 2.2005 | 0.7217 | 100.0000 | 0.0165 | 0.0054 | 0.7498 | 0.0680 | 0.0223 | 3.0902 |
| 3508 | 273.1 | 2.1914 | 0.8024 | 100.0000 | 0.0099 | 0.0036 | 0.4518 | 0.0636 | 0.0233 | 2.9023 |
| 3509 | 325.5 | 2.1078 | 0.6476 | 100.0000 | 0.0143 | 0.0044 | 0.6784 | 0.0607 | 0.0186 | 2.8798 |
| 3510 | 321.8 | 2.0651 | 0.6417 | 100.0000 | 0.0166 | 0.0052 | 0.8038 | 0.0678 | 0.0211 | 3.2831 |
| 3511 | 282.8 | 1.9249 | 0.6807 | 100.0000 | 0.0116 | 0.0041 | 0.6026 | 0.0562 | 0.0199 | 2.9196 |
| 3512 | 352.1 | 2.0166 | 0.5727 | 100.0000 | 0.0156 | 0.0044 | 0.7736 | 0.0592 | 0.0168 | 2.9356 |
| 3513 | 329.8 | 1.9841 | 0.6016 | 100.0000 | 0.0153 | 0.0046 | 0.7711 | 0.0730 | 0.0221 | 3.6793 |
| 3514 | 297.7 | 2.1051 | 0.7071 | 100.0000 | 0.0156 | 0.0052 | 0.7411 | 0.0715 | 0.0240 | 3.3965 |
| 3515 | 287.5 | 2.3082 | 0.8029 | 100.0000 | 0.0121 | 0.0042 | 0.5242 | 0.0607 | 0.0211 | 2.6298 |
| 3516 | 299.6 | 1.9358 | 0.6461 | 100.0000 | 0.0168 | 0.0056 | 0.8679 | 0.0606 | 0.0202 | 3.1305 |
| 3518 | 347.4 | 2.2289 | 0.6416 | 100.0000 | 0.0155 | 0.0045 | 0.6954 | 0.0590 | 0.0170 | 2.6470 |
| 3520 | 347.7 | 2.0727 | 0.5961 | 100.0000 | 0.0141 | 0.0041 | 0.6803 | 0.0640 | 0.0184 | 3.0878 |
| 3522 | 325.2 | 2.0693 | 0.6363 | 100.0000 | 0.0149 | 0.0046 | 0.7201 | 0.0584 | 0.0180 | 2.8222 |
| 3523 | 304.4 | 2.0985 | 0.6894 | 100.0000 | 0.0152 | 0.0050 | 0.7243 | 0.0645 | 0.0212 | 3.0736 |
| 3525 | 303.5 | 2.0752 | 0.6838 | 100.0000 | 0.0162 | 0.0053 | 0.7806 | 0.0541 | 0.0178 | 2.6070 |
| 3526 | 323.1 | 2.0754 | 0.6423 | 100.0000 | 0.0151 | 0.0047 | 0.7276 | 0.0639 | 0.0198 | 3.0789 |

| Females | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Brain | | | Pituitary | | | Adrenal Glands | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | |
| 4501 | 302.2 | 1.9874 | 0.6576 | 100.0000 | 0.0146 | 0.0048 | 0.7346 | 0.0646 | 0.0214 | 3.2505 |
| 4502 | 301.0 | 2.0782 | 0.6904 | 100.0000 | 0.0122 | 0.0041 | 0.5870 | 0.0630 | 0.0209 | 3.0315 |
| 4503 | 303.0 | 2.0564 | 0.6787 | 100.0000 | 0.0166 | 0.0055 | 0.8072 | 0.0577 | 0.0190 | 2.8059 |
| 4504 | 272.5 | 1.9963 | 0.7326 | 100.0000 | 0.0114 | 0.0042 | 0.5711 | 0.0675 | 0.0248 | 3.3813 |
| 4505 | 315.1 | 1.9663 | 0.6240 | 100.0000 | 0.0142 | 0.0045 | 0.7222 | 0.0595 | 0.0189 | 3.0260 |
| 4509 | 306.6 | 2.2077 | 0.7201 | 100.0000 | 0.0137 | 0.0045 | 0.6206 | 0.0688 | 0.0224 | 3.1164 |
| 4510 | 324.2 | 2.0517 | 0.6329 | 100.0000 | 0.0175 | 0.0054 | 0.8530 | 0.0592 | 0.0183 | 2.8854 |
| 4512 | 292.0 | 2.0813 | 0.7128 | 100.0000 | 0.0171 | 0.0059 | 0.8216 | 0.0574 | 0.0197 | 2.7579 |
| 4513 | 278.6 | 1.9389 | 0.6959 | 100.0000 | 0.0095 | 0.0034 | 0.4900 | 0.0677 | 0.0243 | 3.4917 |
| 4515 | 316.5 | 2.1211 | 0.6702 | 100.0000 | 0.0125 | 0.0039 | 0.5893 | 0.0327 | 0.0103 | 1.5417 |
| 4516 | 303.5 | 2.0507 | 0.6757 | 100.0000 | 0.0153 | 0.0050 | 0.7461 | 0.0631 | 0.0208 | 3.0770 |
| 4517 | 295.0 | 2.0097 | 0.6813 | 100.0000 | 0.0163 | 0.0055 | 0.8111 | 0.0598 | 0.0203 | 2.9756 |
| 4518 | 330.0 | 2.1769 | 0.6597 | 100.0000 | 0.0162 | 0.0049 | 0.7442 | 0.0741 | 0.0225 | 3.4039 |
| 4521 | 295.8 | 2.1123 | 0.7141 | 100.0000 | 0.0153 | 0.0052 | 0.7243 | 0.0668 | 0.0226 | 3.1624 |
| 4522 | 291.6 | 2.0193 | 0.6925 | 100.0000 | 0.0134 | 0.0046 | 0.6636 | 0.0701 | 0.0240 | 3.4715 |
| 4523 | 282.1 | 2.1324 | 0.7559 | 100.0000 | 0.0130 | 0.0046 | 0.6096 | 0.0755 | 0.0268 | 3.5406 |
| 4524 | 295.8 | 1.9784 | 0.6688 | 100.0000 | 0.0125 | 0.0042 | 0.6318 | 0.0551 | 0.0186 | 2.7851 |
| 4525 | 336.2 | 1.9917 | 0.5924 | 100.0000 | 0.0160 | 0.0048 | 0.8033 | 0.0605 | 0.0180 | 3.0376 |
| 4526 | 285.9 | 2.0351 | 0.7118 | 100.0000 | 0.0142 | 0.0050 | 0.6978 | 0.0590 | 0.0206 | 2.8991 |

| Females | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Ovaries | | | Spleen | | | Kidneys | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | |
| 1501 | 286.5 | 0.0907 | 0.0317 | 4.3072 | 0.5520 | 0.1927 | 26.2133 | 2.0473 | 0.7146 | 97.2220 |
| 1502 | 282.2 | 0.0953 | 0.0338 | 4.5970 | 0.6205 | 0.2199 | 29.9310 | 2.0213 | 0.7163 | 97.5013 |
| 1503 | 276.1 | 0.0799 | 0.0289 | 4.2768 | 0.5039 | 0.1825 | 26.9725 | 1.8202 | 0.6593 | 97.4307 |
| 1505 | 316.2 | 0.1037 | 0.0328 | 5.3954 | 0.4832 | 0.1528 | 25.1405 | 2.0060 | 0.6344 | 104.3704 |
| 1506 | 291.8 | 0.0672 | 0.0230 | 3.1901 | 0.4899 | 0.1679 | 23.2566 | 1.8224 | 0.6245 | 86.5132 |
| 1507 | 315.6 | 0.1324 | 0.0420 | 6.4551 | 0.6582 | 0.2086 | 32.0901 | 2.2082 | 0.6997 | 107.6593 |
| 1508 | 309.0 | 0.0872 | 0.0282 | 4.3918 | 0.5609 | 0.1815 | 28.2498 | 2.0660 | 0.6686 | 104.0544 |
| 1510 | 312.5 | 0.0790 | 0.0253 | 3.9257 | 0.5746 | 0.1839 | 28.5530 | 2.0594 | 0.6590 | 102.3355 |
| 1511 | 282.2 | 0.0943 | 0.0334 | 4.5859 | 0.5149 | 0.1825 | 25.0401 | 2.0164 | 0.7145 | 98.0596 |
| 1514 | 338.3 | 0.1030 | 0.0304 | 4.9581 | 0.7295 | 0.2156 | 35.1160 | 1.9824 | 0.5860 | 95.4270 |
| 1515 | 274.2 | 0.0516 | 0.0188 | 2.7191 | 0.4543 | 0.1657 | 23.9395 | 1.9753 | 0.7204 | 104.0892 |
| 1516 | 294.0 | 0.1156 | 0.0393 | 5.4428 | 0.5283 | 0.1797 | 24.8741 | 2.2131 | 0.7528 | 104.1998 |
| 1517 | 299.7 | 0.0662 | 0.0221 | 3.2787 | 0.5270 | 0.1758 | 26.1007 | 2.0502 | 0.6841 | 101.5403 |
| 1518 | 310.0 | 0.0828 | 0.0267 | 4.2470 | 0.6296 | 0.2031 | 32.2938 | 2.4027 | 0.7751 | 123.2407 |
| 1519 | 303.7 | 0.0885 | 0.0291 | 3.9727 | 0.6528 | 0.2149 | 29.3038 | 1.9120 | 0.6296 | 85.8284 |
| 1520 | 316.9 | 0.0950 | 0.0300 | 4.4330 | 0.5271 | 0.1663 | 24.5964 | 2.1191 | 0.6687 | 98.8847 |
| 1523 | 307.3 | 0.0662 | 0.0215 | 3.1361 | 0.6237 | 0.2030 | 29.5466 | 2.1257 | 0.6917 | 100.7011 |
| 1525 | 320.3 | 0.1020 | 0.0318 | 4.8477 | 0.5656 | 0.1766 | 26.8809 | 2.1275 | 0.6642 | 101.1121 |
| 1526 | 312.8 | 0.0763 | 0.0244 | 3.7437 | 0.5805 | 0.1856 | 28.4824 | 1.9927 | 0.6371 | 97.7724 |

| Females | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Ovaries | | | Spleen | | | Kidneys | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | |
| 2501 | 305.1 | 0.0829 | 0.0272 | 3.9063 | 0.6859 | 0.2248 | 32.3202 | 2.1385 | 0.7009 | 100.7681 |
| 2502 | 302.3 | 0.0901 | 0.0298 | 4.4931 | 0.6071 | 0.2008 | 30.2748 | 1.8994 | 0.6283 | 94.7190 |
| 2503 | 283.8 | 0.0618 | 0.0218 | 3.1839 | 0.6690 | 0.2357 | 34.4668 | 1.6939 | 0.5969 | 87.2694 |
| 2504 | 340.9 | 0.0899 | 0.0264 | 4.0882 | 0.6669 | 0.1956 | 30.3274 | 2.3045 | 0.6760 | 104.7976 |
| 2507 | 293.6 | 0.0769 | 0.0262 | 3.8135 | 0.6201 | 0.2112 | 30.7513 | 2.2132 | 0.7538 | 109.7545 |
| 2509 | 313.3 | 0.0951 | 0.0304 | 4.4212 | 0.6338 | 0.2023 | 29.4654 | 1.9319 | 0.6166 | 89.8140 |
| 2510 | 301.9 | 0.1267 | 0.0420 | 6.5262 | 0.6284 | 0.2081 | 32.3684 | 2.3883 | 0.7911 | 123.0195 |
| 2512 | 281.5 | 0.0759 | 0.0270 | 3.7139 | 0.6848 | 0.2433 | 33.5079 | 1.8711 | 0.6647 | 91.5545 |
| 2513 | 317.3 | 0.0693 | 0.0218 | 3.5251 | 0.5301 | 0.1671 | 26.9647 | 2.0974 | 0.6610 | 106.6890 |
| 2514 | 300.6 | 0.0890 | 0.0296 | 4.1702 | 0.5070 | 0.1687 | 23.7560 | 1.9242 | 0.6401 | 90.1602 |
| 2515 | 317.2 | 0.0742 | 0.0234 | 3.5690 | 0.5880 | 0.1854 | 28.2828 | 1.9014 | 0.5994 | 91.4574 |
| 2517 | 280.0 | 0.0921 | 0.0329 | 4.6716 | 0.6532 | 0.2333 | 33.1321 | 2.1038 | 0.7514 | 106.7106 |
| 2518 | 287.4 | 0.0877 | 0.0305 | 4.2117 | 0.4361 | 0.1517 | 20.9432 | 2.2728 | 0.7908 | 109.1485 |
| 2519 | 282.7 | 0.0684 | 0.0242 | 3.3865 | 0.5563 | 0.1968 | 27.5423 | 1.8023 | 0.6375 | 89.2316 |
| 2520 | 296.9 | 0.0780 | 0.0263 | 4.0966 | 0.5684 | 0.1914 | 29.8529 | 1.9374 | 0.6525 | 101.7542 |
| 2521 | 314.4 | 0.0756 | 0.0240 | 3.9484 | 0.5845 | 0.1859 | 30.5270 | 1.7699 | 0.5629 | 92.4375 |
| 2522 | 331.0 | 0.0884 | 0.0267 | 4.2825 | 0.5860 | 0.1770 | 28.3887 | 1.8163 | 0.5487 | 87.9905 |
| 2523 | 276.3 | 0.0515 | 0.0186 | 2.4788 | 0.5506 | 0.1993 | 26.5017 | 1.8614 | 0.6737 | 89.5938 |
| 2524 | 301.3 | 0.0953 | 0.0316 | 4.4790 | 0.5935 | 0.1970 | 27.8940 | 2.0711 | 0.6874 | 97.3399 |

| Females | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Ovaries | | | Spleen | | | Kidneys | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | |
| 3501 | 314.3 | 0.0802 | 0.0255 | 3.9970 | 0.5566 | 0.1771 | 27.7398 | 2.0550 | 0.6538 | 102.4171 |
| 3503 | 272.6 | 0.1762 | 0.0646 | 9.0008 | 0.5514 | 0.2023 | 28.1671 | 2.3671 | 0.8683 | 120.9185 |
| 3505 | 324.4 | 0.0844 | 0.0260 | 3.8739 | 0.7354 | 0.2267 | 33.7541 | 2.0074 | 0.6188 | 92.1375 |
| 3506 | 307.5 | 0.0625 | 0.0203 | 3.0068 | 0.5927 | 0.1927 | 28.5144 | 1.8359 | 0.5970 | 88.3239 |
| 3507 | 304.9 | 0.0866 | 0.0284 | 3.9355 | 0.6107 | 0.2003 | 27.7528 | 2.3320 | 0.7648 | 105.9759 |
| 3508 | 273.1 | 0.0757 | 0.0277 | 3.4544 | 0.5851 | 0.2142 | 26.6998 | 1.7917 | 0.6561 | 81.7605 |
| 3509 | 325.5 | 0.0976 | 0.0300 | 4.6304 | 0.5809 | 0.1785 | 27.5595 | 2.0143 | 0.6188 | 95.5641 |
| 3510 | 321.8 | 0.0932 | 0.0290 | 4.5131 | 0.5969 | 0.1855 | 28.9042 | 1.9936 | 0.6195 | 96.5377 |
| 3511 | 282.8 | 0.0788 | 0.0279 | 4.0937 | 0.6700 | 0.2369 | 34.8070 | 1.9089 | 0.6750 | 99.1688 |
| 3512 | 352.1 | 0.1053 | 0.0299 | 5.2217 | 0.7558 | 0.2147 | 37.4789 | 2.5207 | 0.7159 | 124.9975 |
| 3513 | 329.8 | 0.0934 | 0.0283 | 4.7074 | 0.6668 | 0.2022 | 33.6072 | 3.0725 | 0.9316 | 154.8561 |
| 3514 | 297.7 | 0.0871 | 0.0293 | 4.1376 | 0.6630 | 0.2227 | 31.4949 | 2.2772 | 0.7649 | 108.1754 |
| 3515 | 287.5 | 0.0871 | 0.0303 | 3.7735 | 0.6574 | 0.2287 | 28.4811 | 1.8139 | 0.6309 | 78.5850 |
| 3516 | 299.6 | 0.0860 | 0.0287 | 4.4426 | 0.4950 | 0.1652 | 25.5708 | 2.1252 | 0.7093 | 109.7841 |
| 3518 | 347.4 | 0.1002 | 0.0288 | 4.4955 | 0.7922 | 0.2280 | 35.5422 | 2.4414 | 0.7028 | 109.5339 |
| 3520 | 347.7 | 0.0893 | 0.0257 | 4.3084 | 0.5747 | 0.1653 | 27.7271 | 2.1239 | 0.6108 | 102.4702 |
| 3522 | 325.2 | 0.0936 | 0.0288 | 4.5233 | 0.6089 | 0.1872 | 29.4254 | 2.1915 | 0.6739 | 105.9054 |
| 3523 | 304.4 | 0.0892 | 0.0293 | 4.2507 | 0.6088 | 0.2000 | 29.0112 | 2.0027 | 0.6579 | 95.4348 |
| 3525 | 303.5 | 0.0766 | 0.0252 | 3.6912 | 0.5405 | 0.1781 | 26.0457 | 2.3055 | 0.7596 | 111.0977 |
| 3526 | 323.1 | 0.1002 | 0.0310 | 4.8280 | 0.5977 | 0.1850 | 28.7993 | 1.8225 | 0.5641 | 87.8144 |

| Females | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Ovaries | | | Spleen | | | Kidneys | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | |
| 4501 | 302.2 | 0.1122 | 0.0371 | 5.6456 | 0.6364 | 0.2106 | 32.0217 | 2.6721 | 0.8842 | 134.4520 |
| 4502 | 301.0 | 0.1378 | 0.0458 | 6.6307 | 0.6996 | 0.2324 | 33.6637 | 2.4674 | 0.8197 | 118.7277 |
| 4503 | 303.0 | 0.0916 | 0.0302 | 4.4544 | 0.4805 | 0.1586 | 23.3661 | 1.8589 | 0.6135 | 90.3958 |
| 4504 | 272.5 | 0.0761 | 0.0279 | 3.8121 | 0.3969 | 0.1457 | 19.8818 | 2.0950 | 0.7688 | 104.9441 |
| 4505 | 315.1 | 0.0959 | 0.0304 | 4.8772 | 0.6100 | 0.1936 | 31.0227 | 2.2218 | 0.7051 | 112.9939 |
| 4509 | 306.6 | 0.0993 | 0.0324 | 4.4979 | 0.6164 | 0.2010 | 27.9205 | 2.0004 | 0.6524 | 90.6101 |
| 4510 | 324.2 | 0.0982 | 0.0303 | 4.7863 | 0.5453 | 0.1682 | 26.5780 | 2.1299 | 0.6570 | 103.8115 |
| 4512 | 292.0 | 0.0762 | 0.0261 | 3.6612 | 0.5200 | 0.1781 | 24.9844 | 2.0493 | 0.7018 | 98.4625 |
| 4513 | 278.6 | 0.0489 | 0.0176 | 2.5220 | 0.4925 | 0.1768 | 25.4010 | 2.0649 | 0.7412 | 106.4985 |
| 4515 | 316.5 | 0.0654 | 0.0207 | 3.0833 | 0.5314 | 0.1679 | 25.0530 | 1.8997 | 0.6002 | 89.5620 |
| 4516 | 303.5 | 0.0770 | 0.0254 | 3.7548 | 0.4995 | 0.1646 | 24.3575 | 1.8163 | 0.5985 | 88.5698 |
| 4517 | 295.0 | 0.0863 | 0.0293 | 4.2942 | 0.6174 | 0.2093 | 30.7210 | 2.0646 | 0.6999 | 102.7318 |
| 4518 | 330.0 | 0.0827 | 0.0251 | 3.7990 | 0.5871 | 0.1779 | 26.9695 | 2.6803 | 0.8122 | 123.1246 |
| 4521 | 295.8 | 0.0829 | 0.0280 | 3.9246 | 0.5445 | 0.1841 | 25.7776 | 1.9655 | 0.6645 | 93.0502 |
| 4522 | 291.6 | 0.1006 | 0.0345 | 4.9819 | 0.5131 | 0.1760 | 25.4098 | 1.8725 | 0.6421 | 92.7302 |
| 4523 | 282.1 | 0.1042 | 0.0369 | 4.8865 | 0.5457 | 0.1934 | 25.5909 | 1.8412 | 0.6527 | 86.3440 |
| 4524 | 295.8 | 0.1214 | 0.0410 | 6.1363 | 0.6375 | 0.2155 | 32.2230 | 2.1033 | 0.7111 | 106.3132 |
| 4525 | 336.2 | 0.0937 | 0.0279 | 4.7045 | 0.5148 | 0.1531 | 25.8473 | 2.2294 | 0.6631 | 111.9345 |
| 4526 | 285.9 | 0.0727 | 0.0254 | 3.5723 | 0.4439 | 0.1553 | 21.8122 | 2.0979 | 0.7338 | 103.0858 |

| Females | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Liver | | | Lungs w/ Trachea | | | Uterus w/ Cervix | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | |
| 1501 | 286.5 | 9.7871 | 3.4161 | 464.7687 | 1.3384 | 0.4672 | 63.5578 | 0.6670 | 0.2328 | 31.6744 |
| 1502 | 282.2 | 10.2187 | 3.6211 | 492.9188 | 1.2244 | 0.4339 | 59.0613 | 0.5004 | 0.1773 | 24.1378 |
| 1503 | 276.1 | 8.5855 | 3.1096 | 459.5600 | 1.2352 | 0.4474 | 66.1171 | 0.6160 | 0.2231 | 32.9729 |
| 1505 | 316.2 | 10.2262 | 3.2341 | 532.0604 | 1.2353 | 0.3907 | 64.2716 | 0.7296 | 0.2307 | 37.9605 |
| 1506 | 291.8 | 9.3301 | 3.1974 | 442.9195 | 1.2005 | 0.4114 | 56.9903 | 0.7626 | 0.2613 | 36.2022 |
| 1507 | 315.6 | 12.2338 | 3.8764 | 596.4507 | 1.3283 | 0.4209 | 64.7604 | 0.6674 | 0.2115 | 32.5386 |
| 1508 | 309.0 | 10.8939 | 3.5255 | 548.6729 | 1.2920 | 0.4181 | 65.0718 | 0.4089 | 0.1323 | 20.5943 |
| 1510 | 312.5 | 11.2049 | 3.5856 | 556.7929 | 1.3140 | 0.4205 | 65.2952 | 0.4373 | 0.1399 | 21.7303 |
| 1511 | 282.2 | 9.9738 | 3.5343 | 485.0362 | 1.2576 | 0.4456 | 61.1584 | 0.6051 | 0.2144 | 29.4266 |
| 1514 | 338.3 | 13.4027 | 3.9618 | 645.1670 | 1.5293 | 0.4521 | 73.6161 | 0.7789 | 0.2302 | 37.4940 |
| 1515 | 274.2 | 9.5822 | 3.4946 | 504.9376 | 1.1938 | 0.4354 | 62.9077 | 0.5625 | 0.2051 | 29.6411 |
| 1516 | 294.0 | 8.5501 | 2.9082 | 402.5660 | 1.3241 | 0.4504 | 62.3429 | 0.5327 | 0.1812 | 25.0812 |
| 1517 | 299.7 | 10.8684 | 3.6264 | 538.2794 | 1.2634 | 0.4216 | 62.5724 | 0.5401 | 0.1802 | 26.7495 |
| 1518 | 310.0 | 9.8905 | 3.1905 | 507.3092 | 1.4930 | 0.4816 | 76.5798 | 0.8718 | 0.2812 | 44.7169 |
| 1519 | 303.7 | 14.0339 | 4.6210 | 629.9726 | 1.3515 | 0.4450 | 60.6680 | 0.3847 | 0.1267 | 17.2689 |
| 1520 | 316.9 | 9.4259 | 2.9744 | 439.8460 | 1.3423 | 0.4236 | 62.6365 | 0.7617 | 0.2404 | 35.5436 |
| 1523 | 307.3 | 10.0923 | 3.2842 | 478.1041 | 1.4180 | 0.4614 | 67.1751 | 0.8851 | 0.2880 | 41.9300 |
| 1525 | 320.3 | 11.0370 | 3.4458 | 524.5473 | 1.1440 | 0.3572 | 54.3700 | 0.7388 | 0.2307 | 35.1124 |
| 1526 | 312.8 | 9.1087 | 2.9120 | 446.9212 | 1.3982 | 0.4470 | 68.6031 | 0.6259 | 0.2001 | 30.7100 |

| Females | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Liver | | | Lungs w/ Trachea | | | Uterus w/ Cervix | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | |
| 2501 | 305.1 | 10.1002 | 3.3105 | 475.9306 | 1.2848 | 0.4211 | 60.5409 | 0.7451 | 0.2442 | 35.1098 |
| 2502 | 302.3 | 11.4307 | 3.7812 | 570.0244 | 1.1897 | 0.3935 | 59.3278 | 0.7523 | 0.2489 | 37.5156 |
| 2503 | 283.8 | 9.5231 | 3.3556 | 490.6285 | 1.3455 | 0.4741 | 69.3199 | 0.6840 | 0.2410 | 35.2396 |
| 2504 | 340.9 | 12.0651 | 3.5392 | 548.6630 | 1.4922 | 0.4377 | 67.8581 | 0.5482 | 0.1608 | 24.9295 |
| 2507 | 293.6 | 11.3342 | 3.8604 | 562.0729 | 1.4937 | 0.5088 | 74.0739 | 0.6754 | 0.2300 | 33.4937 |
| 2509 | 313.3 | 10.5682 | 3.3732 | 491.3157 | 1.4727 | 0.4701 | 68.4658 | 0.6398 | 0.2042 | 29.7443 |
| 2510 | 301.9 | 11.8425 | 3.9227 | 609.9979 | 1.2160 | 0.4028 | 62.6352 | 0.8241 | 0.2730 | 42.4487 |
| 2512 | 281.5 | 10.1137 | 3.5928 | 494.8720 | 1.1497 | 0.4084 | 56.2558 | 0.6041 | 0.2146 | 29.5591 |
| 2513 | 317.3 | 8.9310 | 2.8147 | 454.2957 | 1.2223 | 0.3852 | 62.1751 | 0.6351 | 0.2002 | 32.3058 |
| 2514 | 300.6 | 9.7252 | 3.2353 | 455.6836 | 1.3930 | 0.4634 | 65.2704 | 0.4194 | 0.1395 | 19.6514 |
| 2515 | 317.2 | 9.8549 | 3.1068 | 474.0212 | 1.2467 | 0.3930 | 59.9663 | 0.5506 | 0.1736 | 26.4839 |
| 2517 | 280.0 | 9.5280 | 3.4029 | 483.2868 | 1.3023 | 0.4651 | 66.0563 | 0.5789 | 0.2068 | 29.3634 |
| 2518 | 287.4 | 10.4000 | 3.6186 | 499.4477 | 1.2463 | 0.4336 | 59.8521 | 0.5025 | 0.1748 | 24.1320 |
| 2519 | 282.7 | 10.5125 | 3.7186 | 520.4723 | 1.2728 | 0.4502 | 63.0161 | 0.4450 | 0.1574 | 22.0319 |
| 2520 | 296.9 | 9.0055 | 3.0332 | 472.9779 | 1.3857 | 0.4667 | 72.7784 | 0.6037 | 0.2033 | 31.7069 |
| 2521 | 314.4 | 12.2848 | 3.9074 | 641.6044 | 1.3776 | 0.4382 | 71.9486 | 0.6708 | 0.2134 | 35.0342 |
| 2522 | 331.0 | 10.9316 | 3.3026 | 529.5805 | 1.5272 | 0.4614 | 73.9851 | 0.5616 | 0.1697 | 27.2067 |
| 2523 | 276.3 | 8.9664 | 3.2452 | 431.5749 | 1.1374 | 0.4117 | 54.7459 | 0.3403 | 0.1232 | 16.3795 |
| 2524 | 301.3 | 10.7118 | 3.5552 | 503.4450 | 1.4420 | 0.4786 | 67.7727 | 0.6091 | 0.2022 | 28.6272 |

| Females | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Liver | | | Lungs w/ Trachea | | | Uterus w/ Cervix | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | |
| 3501 | 314.3 | 11.0063 | 3.5018 | 548.5323 | 1.3124 | 0.4176 | 65.4074 | 0.4141 | 0.1318 | 20.6379 |
| 3503 | 272.6 | 10.6381 | 3.9025 | 543.4256 | 1.3036 | 0.4782 | 66.5917 | 1.0901 | 0.3999 | 55.6855 |
| 3505 | 324.4 | 11.9616 | 3.6873 | 549.0246 | 1.4371 | 0.4430 | 65.9614 | 0.7723 | 0.2381 | 35.4477 |
| 3506 | 307.5 | 11.9928 | 3.9001 | 576.9653 | 1.3539 | 0.4403 | 65.1352 | 0.7182 | 0.2336 | 34.5521 |
| 3507 | 304.9 | 9.5337 | 3.1268 | 433.2515 | 1.3143 | 0.4311 | 59.7273 | 0.6992 | 0.2293 | 31.7746 |
| 3508 | 273.1 | 9.5973 | 3.5142 | 437.9529 | 1.2574 | 0.4604 | 57.3788 | 0.6721 | 0.2461 | 30.6699 |
| 3509 | 325.5 | 10.4816 | 3.2202 | 497.2768 | 1.6497 | 0.5068 | 78.2664 | 1.0871 | 0.3340 | 51.5751 |
| 3510 | 321.8 | 9.7460 | 3.0286 | 471.9384 | 1.4608 | 0.4539 | 70.7375 | 0.6733 | 0.2092 | 32.6037 |
| 3511 | 282.8 | 9.5325 | 3.3708 | 495.2205 | 1.1308 | 0.3999 | 58.7459 | 0.6481 | 0.2292 | 33.6693 |
| 3512 | 352.1 | 13.4466 | 3.8190 | 666.7956 | 1.4216 | 0.4037 | 70.4949 | 0.5562 | 0.1580 | 27.5811 |
| 3513 | 329.8 | 14.9684 | 4.5386 | 754.4176 | 0.0158 | 0.0048 | 0.7963 | 0.5670 | 0.1719 | 28.5772 |
| 3514 | 297.7 | 11.2270 | 3.7712 | 533.3238 | 1.2374 | 0.4157 | 58.7811 | 0.6436 | 0.2162 | 30.5734 |
| 3515 | 287.5 | 12.0606 | 4.1950 | 522.5110 | 1.1987 | 0.4169 | 51.9322 | 0.6574 | 0.2287 | 28.4811 |
| 3516 | 299.6 | 12.5167 | 4.1778 | 646.5906 | 1.3893 | 0.4637 | 71.7688 | 0.4433 | 0.1480 | 22.9001 |
| 3518 | 347.4 | 10.8500 | 3.1232 | 486.7872 | 1.4831 | 0.4269 | 66.5395 | 1.0093 | 0.2905 | 45.2824 |
| 3520 | 347.7 | 12.3311 | 3.5465 | 594.9293 | 1.3036 | 0.3749 | 62.8938 | 0.7673 | 0.2207 | 37.0193 |
| 3522 | 325.2 | 10.7844 | 3.3162 | 521.1617 | 1.2556 | 0.3861 | 60.6775 | 0.6280 | 0.1931 | 30.3484 |
| 3523 | 304.4 | 10.8356 | 3.5597 | 516.3498 | 1.3813 | 0.4538 | 65.8232 | 0.4200 | 0.1380 | 20.0143 |
| 3525 | 303.5 | 13.0870 | 4.3120 | 630.6380 | 1.4979 | 0.4935 | 72.1810 | 0.8774 | 0.2891 | 42.2803 |
| 3526 | 323.1 | 11.2808 | 3.4914 | 543.5482 | 1.4179 | 0.4388 | 68.3194 | 0.4694 | 0.1453 | 22.6173 |

| Females | Parental organ weights - individual values (grams) | Appendix 22 |
|---|---|---|

| Animal Number | Term bwt (g) | Liver | | | Lungs w/ Trachea | | | Uterus w/ Cervix | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (g) | %Body | %Brain | (g) | %Body | %Brain | (g) | %Body | %Brain |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | |
| 4501 | 302.2 | 11.8616 | 3.9251 | 596.8401 | 1.3213 | 0.4372 | 66.4838 | 0.5010 | 0.1658 | 25.2088 |
| 4502 | 301.0 | 11.4735 | 3.8118 | 552.0883 | 1.2748 | 0.4235 | 61.3415 | 0.7195 | 0.2390 | 34.6213 |
| 4503 | 303.0 | 9.8594 | 3.2539 | 479.4495 | 1.4431 | 0.4763 | 70.1760 | 0.4934 | 0.1628 | 23.9934 |
| 4504 | 272.5 | 9.2096 | 3.3797 | 461.3335 | 1.3311 | 0.4885 | 66.6784 | 1.0054 | 0.3690 | 50.3632 |
| 4505 | 315.1 | 13.2883 | 4.2172 | 675.8023 | 1.5195 | 0.4822 | 77.2771 | 0.6025 | 0.1912 | 30.6413 |
| 4509 | 306.6 | 10.3025 | 3.3602 | 466.6621 | 1.4686 | 0.4790 | 66.5217 | 0.6235 | 0.2034 | 28.2421 |
| 4510 | 324.2 | 12.2822 | 3.7885 | 598.6353 | 1.3034 | 0.4020 | 63.5278 | 1.0515 | 0.3243 | 51.2502 |
| 4512 | 292.0 | 10.7159 | 3.6698 | 514.8657 | 1.4238 | 0.4876 | 68.4092 | 0.4292 | 0.1470 | 20.6217 |
| 4513 | 278.6 | 11.1104 | 3.9879 | 573.0259 | 1.3576 | 0.4873 | 70.0191 | 0.5084 | 0.1825 | 26.2211 |
| 4515 | 316.5 | 10.4523 | 3.3025 | 492.7773 | 1.3569 | 0.4287 | 63.9715 | 0.4174 | 0.1319 | 19.6785 |
| 4516 | 303.5 | 11.0908 | 3.6543 | 540.8300 | 1.3340 | 0.4395 | 65.0510 | 0.5569 | 0.1835 | 27.1566 |
| 4517 | 295.0 | 10.0429 | 3.4044 | 499.7214 | 1.1419 | 0.3871 | 56.8194 | 0.4271 | 0.1448 | 21.2519 |
| 4518 | 330.0 | 12.2076 | 3.6993 | 560.7791 | 1.4752 | 0.4470 | 67.7661 | 0.8278 | 0.2508 | 38.0266 |
| 4521 | 295.8 | 10.0289 | 3.3904 | 474.7858 | 1.3551 | 0.4581 | 64.1528 | 0.5958 | 0.2014 | 28.2062 |
| 4522 | 291.6 | 11.2487 | 3.8576 | 557.0594 | 1.2924 | 0.4432 | 64.0024 | 0.4468 | 0.1532 | 22.1265 |
| 4523 | 282.1 | 9.0742 | 3.2167 | 425.5393 | 1.3621 | 0.4828 | 63.8764 | 0.5595 | 0.1983 | 26.2380 |
| 4524 | 295.8 | 10.8192 | 3.6576 | 546.8662 | 1.3775 | 0.4657 | 69.6270 | 0.3751 | 0.1268 | 18.9598 |
| 4525 | 336.2 | 11.5310 | 3.4298 | 578.9527 | 1.3324 | 0.3963 | 66.8976 | 0.6259 | 0.1862 | 31.4254 |
| 4526 | 285.9 | 9.8165 | 3.4335 | 482.3596 | 1.3421 | 0.4694 | 65.9476 | 0.6268 | 0.2192 | 30.7995 |

| | Pup organ weights - individual values (grams) | | | | | | | | | | | Appendix 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dam Number Relative to | Pup Number | Pup Sex | Terminal body wt (g) | Spleen wt (g) | Spleen wt Body (%) | Spleen wt Brain (%) | Thymus wt (g) | Thymus wt Body (%) | Thymus wt Brain (%) | Brain wt (g) | Brain wt Body (%) | Brain wt Brain (%) |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | |
| 1501 | 1 | M | 36.1 | 0.1132 | 0.3136 | 8.71 | 0.2003 | 0.5548 | 15.42 | 1.2993 | 3.5992 | 100.00 |
| | 12 | F | 32.0 | 0.1094 | 0.3419 | 8.38 | 0.1572 | 0.4913 | 12.04 | 1.3059 | 4.0809 | 100.00 |
| 1502 | 1 | M | 33.8 | 0.0798 | 0.2361 | 5.55 | 0.1228 | 0.3633 | 8.54 | 1.4384 | 4.2556 | 100.00 |
| | 6 | F | 29.8 | 0.0789 | 0.2648 | 6.09 | 0.1303 | 0.4372 | 10.06 | 1.2955 | 4.3473 | 100.00 |
| 1503 | 1 | M | 38.3 | 0.1455 | 0.3799 | 10.14 | 0.1469 | 0.3836 | 10.23 | 1.4355 | 3.7480 | 100.00 |
| | 6 | F | 39.4 | 0.1883 | 0.4779 | 13.49 | 0.1826 | 0.4635 | 13.08 | 1.3959 | 3.5429 | 100.00 |
| 1505 | 1 | M | 36.5 | 0.1164 | 0.3189 | 8.57 | 0.1696 | 0.4647 | 12.49 | 1.3584 | 3.7216 | 100.00 |
| | 9 | F | 39.8 | 0.1372 | 0.3447 | 9.78 | 0.1900 | 0.4774 | 13.54 | 1.4032 | 3.5256 | 100.00 |
| 1506 | 1 | M | 39.8 | 0.1318 | 0.3312 | 9.35 | 0.1627 | 0.4088 | 11.55 | 1.4091 | 3.5405 | 100.00 |
| | 5 | F | 35.9 | 0.1182 | 0.3292 | 9.10 | 0.1588 | 0.4423 | 12.23 | 1.2983 | 3.6164 | 100.00 |
| 1507 | 1 | M | 35.5 | 0.1324 | 0.3730 | 9.77 | 0.1387 | 0.3907 | 10.24 | 1.3549 | 3.8166 | 100.00 |
| | 5 | F | 32.7 | 0.1013 | 0.3098 | 8.04 | 0.1674 | 0.5119 | 13.29 | 1.2600 | 3.8532 | 100.00 |
| 1508 | 1 | M | 40.5 | 0.1601 | 0.3953 | 11.18 | 0.1511 | 0.3731 | 10.56 | 1.4314 | 3.5343 | 100.00 |
| | 6 | F | 34.4 | 0.1042 | 0.3029 | 7.80 | 0.1705 | 0.4956 | 12.76 | 1.3361 | 3.8840 | 100.00 |
| 1510 | 1 | M | 31.3 | 0.1057 | 0.3377 | 7.62 | 0.1214 | 0.3879 | 8.75 | 1.3870 | 4.4313 | 100.00 |
| | 5 | F | 28.8 | 0.0718 | 0.2493 | 5.63 | 0.1076 | 0.3736 | 8.44 | 1.2744 | 4.4250 | 100.00 |
| 1511 | 1 | M | 30.7 | 0.1016 | 0.3309 | 7.67 | 0.1233 | 0.4016 | 9.30 | 1.3252 | 4.3166 | 100.00 |
| | 8 | F | 31.3 | 0.0927 | 0.2962 | 7.11 | 0.1469 | 0.4693 | 11.26 | 1.3047 | 4.1684 | 100.00 |
| 1514 | 1 | M | 50.2 | 0.2710 | 0.5398 | 18.61 | 0.1450 | 0.2888 | 9.96 | 1.4565 | 2.9014 | 100.00 |
| | 5 | F | 54.0 | 0.2674 | 0.4952 | 18.22 | 0.1826 | 0.3381 | 12.44 | 1.4673 | 2.7172 | 100.00 |

| | Pup organ weights - individual values (grams) | | | | | | | | | | | Appendix 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dam Number Relative to | Pup Number | Pup Sex | Terminal body wt (g) | Spleen wt (g) | Spleen wt Body (%) | Spleen wt Brain (%) | Thymus wt (g) | Thymus wt Body (%) | Thymus wt Brain (%) | Brain wt (g) | Brain wt Body (%) | Brain wt Brain (%) |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | |
| 1515 | 1 | M | 32.9 | 0.0916 | 0.2784 | 6.93 | 0.1436 | 0.4365 | 10.86 | 1.3227 | 4.0204 | 100.00 |
| | 8 | F | 29.5 | 0.0866 | 0.2936 | 7.03 | 0.1829 | 0.6200 | 14.84 | 1.2321 | 4.1766 | 100.00 |
| 1516 | 5 | M | 35.7 | 0.1337 | 0.3745 | 10.03 | 0.1632 | 0.4571 | 12.24 | 1.3332 | 3.7345 | 100.00 |
| | 11 | F | 32.2 | 0.1355 | 0.4208 | 10.79 | 0.1687 | 0.5239 | 13.44 | 1.2556 | 3.8994 | 100.00 |
| 1517 | 1 | M | 25.1 | 0.0768 | 0.3060 | 6.39 | 0.0823 | 0.3279 | 6.85 | 1.2023 | 4.7900 | 100.00 |
| | 2 | F | 45.2 | 0.1695 | 0.3750 | 12.26 | 0.2038 | 0.4509 | 14.74 | 1.3827 | 3.0591 | 100.00 |
| 1518 | 2 | M | 42.8 | 0.181 | 0.4229 | 12.00 | 0.2039 | 0.4764 | 13.52 | 1.5078 | 3.5229 | 100.00 |
| | 8 | F | 41.6 | 0.11671 | 0.2806 | 8.59 | 0.1582 | 0.3803 | 11.64 | 1.3591 | 3.2671 | 100.00 |
| 1519 | 1 | M | 45.0 | 0.1959 | 0.4353 | 13.95 | 0.2605 | 0.5789 | 18.56 | 1.4038 | 3.1196 | 100.00 |
| | 11 | F | 25.4 | 0.1262 | 0.4969 | 10.23 | 0.10960 | 0.4315 | 8.89 | 1.2331 | 4.8547 | 100.00 |
| 1520 | 1 | M | 38.0 | 0.1490 | 0.3921 | 10.88 | 0.1308 | 0.3442 | 9.55 | 1.3690 | 3.6026 | 100.00 |
| | 5 | F | 32.5 | 0.1277 | 0.3929 | 9.84 | 0.1023 | 0.3148 | 7.88 | 1.2981 | 3.9942 | 100.00 |
| 1523 | 1 | M | 39.6 | 0.159 | 0.4015 | 10.85 | 0.2096 | 0.5293 | 14.30 | 1.4657 | 3.7013 | 100.00 |
| | 9 | F | 32.1 | 0.115 | 0.3583 | 8.53 | 0.1517 | 0.4726 | 11.25 | 1.3481 | 4.1997 | 100.00 |
| 1525 | 1 | M | 39.1 | 0.1453 | 0.3716 | 10.21 | 0.1650 | 0.4220 | 11.59 | 1.4238 | 3.6414 | 100.00 |
| | 7 | F | 32.8 | 0.1037 | 0.3162 | 7.83 | 0.1393 | 0.4247 | 10.52 | 1.3242 | 4.0372 | 100.00 |
| 1526 | 1 | M | 45.9 | 0.2111 | 0.4599 | 14.79 | 0.1887 | 0.4111 | 13.22 | 1.4272 | 3.1094 | 100.00 |
| | 10 | F | 33.9 | 0.1247 | 0.3678 | 9.83 | 0.1483 | 0.4375 | 11.69 | 1.2688 | 3.7428 | 100.00 |

| | Pup organ weights - individual values (grams) | | | | | | | | | | | Appendix 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dam Number Relative to | Pup Number | Pup Sex | Terminal body wt (g) | Spleen wt (g) | Spleen wt Body (%) | Spleen wt Brain (%) | Thymus wt (g) | Thymus wt Body (%) | Thymus wt Brain (%) | Brain wt (g) | Brain wt Body (%) | Brain wt Brain (%) |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | |
| 2501 | 1 | M | 34.6 | 0.1094 | 0.3162 | 7.58 | 0.1677 | 0.4847 | 11.61 | 1.3708 | 4.1737 | 100.00 |
| | 9 | F | 33.5 | 0.1235 | 0.3687 | 9.26 | 0.1559 | 0.4654 | 11.69 | 1.3264 | 3.9812 | 100.00 |
| 2502 | 1 | M | 40.5 | 0.1752 | 0.4326 | 12.52 | 0.1525 | 0.3765 | 10.90 | 1.4096 | 3.4548 | 100.00 |
| | 7 | F | 42.3 | 0.2290 | 0.5414 | 16.13 | 0.1661 | 0.3927 | 11.70 | 1.3603 | 3.3567 | 100.00 |
| 2503 | 1 | M | 42.0 | 0.1464 | 0.3486 | 10.15 | 0.1851 | 0.4407 | 12.84 | 1.4803 | 3.4336 | 100.00 |
| | 8 | F | 42.8 | 0.1905 | 0.4451 | 13.41 | 0.1844 | 0.4308 | 12.98 | 1.4419 | 3.3182 | 100.00 |
| 2504 | 1 | M | 47.1 | 0.1576 | 0.3346 | 11.22 | 0.2157 | 0.4580 | 15.35 | 1.5462 | 2.9826 | 100.00 |
| | 12 | F | 43.9 | 0.2013 | 0.4585 | 14.61 | 0.2651 | 0.6039 | 19.24 | 1.4794 | 3.1392 | 100.00 |
| 2507 | 1 | M | 40.2 | 0.2030 | 0.5050 | 14.99 | 0.1419 | 0.3530 | 10.48 | 1.3996 | 3.3692 | 100.00 |
| | 10 | F | 37.0 | 0.1736 | 0.4692 | 13.11 | 0.1706 | 0.4611 | 12.88 | 1.3412 | 3.5800 | 100.00 |
| 2509 | 1 | M | 41.1 | 0.1881 | 0.4577 | 14.85 | 0.1684 | 0.4097 | 13.30 | 1.3531 | 3.0810 | 100.00 |
| | 7 | F | 39.1 | 0.1650 | 0.4220 | 12.97 | 0.1751 | 0.4478 | 13.76 | 1.4287 | 3.2545 | 100.00 |
| 2510 | 1 | M | 38.7 | 0.1389 | 0.3589 | 10.21 | 0.1388 | 0.3587 | 10.20 | 1.4133 | 3.5168 | 100.00 |
| | 11 | F | 35.1 | 0.1230 | 0.3504 | 9.62 | 0.1785 | 0.5085 | 13.96 | 1.3045 | 3.6427 | 100.00 |
| 2512 | 1 | M | 37.2 | 0.1292 | 0.3473 | 9.79 | 0.2150 | 0.5780 | 16.30 | 1.3182 | 3.5468 | 100.00 |
| | 10 | F | 34.0 | 0.1191 | 0.3503 | 10.11 | 0.1550 | 0.4559 | 13.15 | 1.3115 | 3.4662 | 100.00 |
| 2513 | 1 | M | 31.0 | 0.0670 | 0.2161 | 4.62 | 0.1130 | 0.3645 | 7.79 | 1.3190 | 4.6797 | 100.00 |
| | 7 | F | 29.0 | 0.0682 | 0.2352 | 4.66 | 0.1222 | 0.4214 | 8.35 | 1.3212 | 5.0493 | 100.00 |
| 2514 | 1 | M | 33.7 | 0.1105 | 0.3279 | 7.65 | 0.1211 | 0.3593 | 8.39 | 1.3906 | 4.2846 | 100.00 |
| | 7 | F | 32.1 | 0.0861 | 0.2682 | 6.44 | 0.1096 | 0.3414 | 8.20 | 1.2626 | 4.1642 | 100.00 |

| | Pup organ weights - individual values (grams) | | | | | | | | | | | Appendix 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dam Number Relative to | Pup Number | Pup Sex | Terminal body wt (g) | Spleen wt (g) | Spleen wt Body (%) | Spleen wt Brain (%) | Thymus wt (g) | Thymus wt Body (%) | Thymus wt Brain (%) | Brain wt (g) | Brain wt Body (%) | Brain wt Brain (%) |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | | | | |
| 2515 | 1 | M | 37.8 | 0.1133 | 0.2997 | 9.11 | 0.1469 | 0.3886 | 11.82 | 1.4441 | 3.2889 | 100.00 |
| | 10 | F | 39.5 | 0.1335 | 0.3380 | 9.60 | 0.1712 | 0.4334 | 12.32 | 1.3337 | 3.5190 | 100.00 |
| 2517 | 1 | M | 35.4 | 0.1496 | 0.4226 | 10.58 | 0.1455 | 0.4110 | 10.29 | 1.3992 | 3.9946 | 100.00 |
| | 5 | F | 37.7 | 0.1576 | 0.4180 | 11.88 | 0.1687 | 0.4475 | 12.71 | 1.4199 | 3.5199 | 100.00 |
| 2518 | 1 | M | 41.4 | 0.1475 | 0.3563 | 10.19 | 0.1089 | 0.2630 | 7.52 | 1.4421 | 3.4973 | 100.00 |
| | 7 | F | 38.0 | 0.1506 | 0.3963 | 10.80 | 0.1406 | 0.3700 | 10.08 | 1.4202 | 3.6697 | 100.00 |
| 2519 | 1 | M | 41.7 | 0.1901 | 0.4559 | 14.73 | 0.1719 | 0.4122 | 13.32 | 1.4048 | 3.0959 | 100.00 |
| | 5 | F | 38.9 | 0.1512 | 0.3887 | 12.53 | 0.2080 | 0.5347 | 17.23 | 1.3781 | 3.1028 | 100.00 |
| 2520 | 1 | M | 38.3 | 0.1158 | 0.3023 | 8.52 | 0.1390 | 0.3629 | 10.23 | 1.3544 | 3.5493 | 100.00 |
| | 10 | F | 34.4 | 0.1133 | 0.3294 | 7.89 | 0.1668 | 0.4849 | 11.61 | 1.3246 | 4.1756 | 100.00 |
| 2521 | 1 | M | 29.3 | 0.1063 | 0.3628 | 7.27 | 0.1341 | 0.4577 | 9.17 | 1.2663 | 4.9911 | 100.00 |
| | 8 | F | 35.4 | 0.1203 | 0.3398 | 8.51 | 0.1520 | 0.4294 | 10.75 | 1.2725 | 3.9932 | 100.00 |
| 2522 | 1 | M | 38.9 | 0.1434 | 0.3686 | 10.48 | 0.1830 | 0.4704 | 13.37 | 1.3610 | 3.5175 | 100.00 |
| | 7 | F | 36.7 | 0.1248 | 0.3401 | 9.61 | 0.1668 | 0.4545 | 12.84 | 1.2786 | 3.5398 | 100.00 |
| 2523 | 1 | M | 32.4 | 0.1208 | 0.3728 | 8.22 | 0.1459 | 0.4503 | 9.93 | 1.3194 | 4.5361 | 100.00 |
| | 9 | F | 28.6 | 0.1072 | 0.3748 | 7.28 | 0.1558 | 0.5448 | 10.58 | 1.1785 | 5.1476 | 100.00 |
| 2524 | 1 | M | 43.3 | 0.1884 | 0.4351 | 12.01 | 0.1938 | 0.4476 | 12.35 | 1.4507 | 3.6238 | 100.00 |
| | 8 | F | 40.4 | 0.2188 | 0.5416 | 15.66 | 0.1681 | 0.4161 | 12.03 | 1.4643 | 3.4589 | 100.00 |

Pup organ weights - individual values (grams) — Appendix 23

| Dam Number Relative to | Pup Number | Pup Sex | Terminal body wt (g) | Spleen wt (g) | Spleen wt Body (%) | Spleen wt Brain (%) | Thymus wt (g) | Thymus wt Body (%) | Thymus wt Brain (%) | Brain wt (g) | Brain wt Body (%) | Brain wt Brain (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | |
| 3501 | 1 | M | 35.4 | 0.1128 | 0.3186 | 7.81 | 0.1702 | 0.4808 | 11.79 | 1.4439 | 4.0788 | 100.00 |
| | 9 | F | 31.9 | 0.0892 | 0.2796 | 6.67 | 0.1698 | 0.5323 | 12.70 | 1.3367 | 4.1903 | 100.00 |
| 3503 | 1 | M | 34.3 | 0.1027 | 0.2994 | 8.26 | 0.1194 | 0.3481 | 9.60 | 1.2432 | 3.6245 | 100.00 |
| | 7 | F | 34.1 | 0.1044 | 0.3062 | 7.51 | 0.1523 | 0.4466 | 10.96 | 1.3900 | 4.0762 | 100.00 |
| 3505 | 1 | M | 40.0 | 0.1631 | 0.4078 | 11.53 | 0.1701 | 0.4253 | 12.03 | 1.4141 | 3.5353 | 100.00 |
| | 7 | F | 37.2 | 0.1386 | 0.3726 | 10.44 | 0.1476 | 0.3968 | 11.12 | 1.327 | 3.5672 | 100.00 |
| 3506 | 1 | M | 40.3 | 0.1552 | 0.3851 | 10.72 | 0.1360 | 0.3375 | 9.39 | 1.4479 | 3.5928 | 100.00 |
| | 6 | F | 36.8 | 0.1476 | 0.4011 | 10.58 | 0.1246 | 0.3386 | 8.94 | 1.3945 | 3.7894 | 100.00 |
| 3507 | 5 | M | 35.7 | 0.1499 | 0.4199 | 11.61 | 0.1696 | 0.4751 | 13.14 | 1.2910 | 3.6162 | 100.00 |
| | 11 | F | 33.4 | 0.1044 | 0.3126 | 8.65 | 0.1927 | 0.5769 | 15.97 | 1.207 | 3.6138 | 100.00 |
| 3508 | 1 | M | 31.3 | 0.1110 | 0.3546 | 8.17 | 0.1325 | 0.4233 | 9.75 | 1.3594 | 4.3431 | 100.00 |
| | 10 | F | 35.1 | 0.1333 | 0.3798 | 9.28 | 0.1591 | 0.4533 | 11.08 | 1.4364 | 4.0923 | 100.00 |
| 3509 | 1 | M | 40.3 | 0.1542 | 0.3826 | 10.54 | 0.1637 | 0.4062 | 11.19 | 1.4624 | 3.6288 | 100.00 |
| | 6 | F | 36.3 | 0.1378 | 0.3796 | 9.75 | 0.1608 | 0.4430 | 11.38 | 1.4136 | 3.8942 | 100.00 |
| 3510 | 1 | M | 36.9 | 0.1150 | 0.3117 | 8.40 | 0.1539 | 0.4171 | 11.25 | 1.3683 | 3.7081 | 100.00 |
| | 6 | F | 34.7 | 0.1015 | 0.2925 | 7.81 | 0.1976 | 0.5695 | 15.21 | 1.2991 | 3.7438 | 100.00 |
| 3511 | 1 | M | 41.4 | 0.1510 | 0.3647 | 10.27 | 0.1877 | 0.4534 | 12.77 | 1.4697 | 3.5500 | 100.00 |
| | 6 | F | 41.9 | 0.1617 | 0.3859 | 10.98 | 0.2263 | 0.5401 | 15.37 | 1.4722 | 3.5136 | 100.00 |
| 3512 | 1 | M | 41.8 | 0.1655 | 0.3959 | 10.55 | 0.1708 | 0.4086 | 10.89 | 1.5691 | 3.7538 | 100.00 |
| | 11 | F | 35.5 | 0.1174 | 0.3307 | 8.40 | 0.1234 | 0.3476 | 8.83 | 1.3974 | 3.9363 | 100.00 |

| | Pup organ weights - individual values (grams) | | | | | | | | | | | Appendix 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dam Number Relative to | Pup Number | Pup Sex | Terminal body wt (g) | Spleen wt (g) | Spleen wt Body (%) | Spleen wt Brain (%) | Thymus wt (g) | Thymus wt Body (%) | Thymus wt Brain (%) | Brain wt (g) | Brain wt Body (%) | Brain wt Brain (%) |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | |
| 3513 | 1 | M | 41.5 | 0.1646 | 0.3966 | 11.47 | 0.2225 | 0.5361 | 15.50 | 1.4353 | 3.4586 | 100.00 |
| | 11 | F | 30.8 | 0.0888 | 0.2883 | 6.88 | 0.1579 | 0.5127 | 12.23 | 1.2913 | 4.1925 | 100.00 |
| 3514 | 1 | M | 49.2 | 0.1645 | 0.3343 | 11.18 | 0.2810 | 0.5711 | 19.09 | 1.4716 | 2.9911 | 100.00 |
| | 5 | F | 43.2 | 0.1724 | 0.3991 | 11.91 | 0.2079 | 0.4813 | 14.36 | 1.4474 | 3.3505 | 100.00 |
| 3515 | 1 | M | 35.3 | 0.1443 | 0.4088 | 9.93 | 0.1255 | 0.3555 | 8.63 | 1.4536 | 4.1178 | 100.00 |
| | 8 | F | 35.3 | 0.1428 | 0.4045 | 10.47 | 0.1875 | 0.5312 | 13.74 | 1.3644 | 3.8652 | 100.00 |
| 3516 | 1 | M | 42.1 | 0.1428 | 0.3392 | 10.23 | 0.2029 | 0.4819 | 14.54 | 1.3957 | 3.3152 | 100.00 |
| | 9 | F | 44.4 | 0.1939 | 0.4367 | 14.08 | 0.2261 | 0.5092 | 16.41 | 1.3775 | 3.1025 | 100.00 |
| 3518 | 6 | M | 8.4 | 0.0230 | 0.2738 | 3.02 | 0.0120 | 0.1429 | 1.58 | 0.7608 | 9.0571 | 100.00 |
| | - | - | - | - | - | - | - | - | - | - | - | - |
| 3520 | 1 | M | 42.6 | 0.1693 | 0.3974 | 11.95 | 0.2013 | 0.4725 | 14.21 | 1.4171 | 3.3265 | 100.00 |
| | 6 | F | 37.3 | 0.1835 | 0.4920 | 12.99 | 0.1469 | 0.3938 | 10.40 | 1.4123 | 3.7863 | 100.00 |
| 3522 | 1 | M | 37.4 | 0.1641 | 0.4388 | 11.46 | 0.1807 | 0.4832 | 12.62 | 1.4324 | 3.8299 | 100.00 |
| | 8 | F | 36.4 | 0.1309 | 0.3596 | 9.19 | 0.1901 | 0.5223 | 13.35 | 1.4243 | 3.9129 | 100.00 |
| 3523 | 1 | M | 38.8 | 0.1278 | 0.3294 | 9.19 | 0.1722 | 0.4438 | 12.38 | 1.3905 | 3.5838 | 100.00 |
| | 6 | F | 35.5 | 0.1418 | 0.3994 | 10.16 | 0.1424 | 0.4011 | 10.20 | 1.3960 | 3.9324 | 100.00 |
| 3525 | 1 | M | 41.8 | 0.1426 | 0.3411 | 9.58 | 0.1841 | 0.4404 | 12.36 | 1.4891 | 3.5624 | 100.00 |
| | 6 | F | 39.0 | 0.1391 | 0.3567 | 9.36 | 0.1998 | 0.5123 | 13.44 | 1.4862 | 3.8108 | 100.00 |
| 3526 | 1 | M | 32.6 | 0.0906 | 0.2779 | 6.38 | 0.1528 | 0.4687 | 10.76 | 1.4203 | 4.3567 | 100.00 |
| | 8 | F | 36.5 | 0.1265 | 0.3466 | 9.20 | 0.1815 | 0.4973 | 13.20 | 1.3753 | 3.7679 | 100.00 |

Pup organ weights - individual values (grams) — Appendix 23

| Dam Number Relative to | Pup Number | Pup Sex | Terminal body wt (g) | Spleen wt (g) | Spleen wt Body (%) | Spleen wt Brain (%) | Thymus wt (g) | Thymus wt Body (%) | Thymus wt Brain (%) | Brain wt (g) | Brain wt Body (%) | Brain wt Brain (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | |
| 4501 | 1 | M | 41.8 | 0.1542 | 0.3689 | 11.27 | 0.1563 | 0.3739 | 11.42 | 1.3683 | 3.2734 | 100.00 |
| | 11 | F | 36.6 | 0.1440 | 0.3934 | 10.74 | 0.1799 | 0.4915 | 13.41 | 1.3413 | 3.6648 | 100.00 |
| 4502 | 1 | M | 44.7 | 0.1303 | 0.2915 | 9.24 | 0.1636 | 0.3660 | 11.60 | 1.4109 | 3.1564 | 100.00 |
| | 8 | F | 40.4 | 0.1482 | 0.3668 | 10.83 | 0.2014 | 0.4985 | 14.72 | 1.3686 | 3.3876 | 100.00 |
| 4503 | 3 | M | 39.5 | 0.1253 | 0.3172 | 9.02 | 0.1398 | 0.3539 | 10.06 | 1.3890 | 3.5165 | 100.00 |
| | 8 | F | 35.8 | 0.1198 | 0.3346 | 9.06 | 0.1304 | 0.3642 | 9.86 | 1.3228 | 3.6950 | 100.00 |
| 4504 | 1 | M | 39.7 | 0.1294 | 0.3259 | 9.23 | 0.1251 | 0.3151 | 8.92 | 1.4019 | 3.5312 | 100.00 |
| | 6 | F | 34.9 | 0.1120 | 0.3209 | 8.42 | 0.1525 | 0.4370 | 11.46 | 1.3303 | 3.8117 | 100.00 |
| 4505 | 1 | M | 45.4 | 0.1821 | 0.4011 | 12.33 | 0.1941 | 0.4275 | 13.15 | 1.4766 | 3.2524 | 100.00 |
| | 7 | F | 40.0 | 0.2334 | 0.5835 | 16.55 | 0.2006 | 0.5015 | 14.22 | 1.4106 | 3.5265 | 100.00 |
| 4509 | 1 | M | 42.5 | 0.1760 | 0.4141 | 12.09 | 0.1885 | 0.4435 | 12.95 | 1.4555 | 3.4247 | 100.00 |
| | 7 | F | 41.6 | 0.1476 | 0.3548 | 10.46 | 0.1873 | 0.4502 | 13.28 | 1.4105 | 3.3906 | 100.00 |
| 4510 | 1 | M | 45.2 | 0.1772 | 0.3920 | 12.19 | 0.1542 | 0.3412 | 10.61 | 1.4540 | 3.2168 | 100.00 |
| | 11 | F | 41.8 | 0.1720 | 0.4115 | 11.89 | 0.1713 | 0.4098 | 11.84 | 1.4466 | 3.4608 | 100.00 |
| 4512 | 1 | M | 36.3 | 0.1096 | 0.3019 | 7.62 | 0.1333 | 0.3672 | 9.27 | 1.4383 | 3.9623 | 100.00 |
| | 6 | F | 39.2 | 0.1575 | 0.4018 | 11.57 | 0.1780 | 0.4541 | 13.07 | 1.3618 | 3.4740 | 100.00 |
| 4513 | 1 | M | 34.2 | 0.1193 | 0.3488 | 9.14 | 0.1764 | 0.5158 | 13.52 | 1.3051 | 3.8161 | 100.00 |
| | 7 | F | 33.5 | 0.0914 | 0.2728 | 6.92 | 0.1548 | 0.4621 | 11.72 | 1.3205 | 3.9418 | 100.00 |
| 4515 | 1 | M | 46.2 | 0.2060 | 0.4459 | 13.70 | 0.1655 | 0.3582 | 11.01 | 1.5038 | 3.2550 | 100.00 |
| | 7 | F | 40.8 | 0.1884 | 0.4618 | 13.49 | 0.1423 | 0.3488 | 10.19 | 1.3970 | 3.4240 | 100.00 |

| | Pup organ weights - individual values (grams) | | | | | | | | | | | Appendix 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dam Number Relative to | Pup Number | Pup Sex | Terminal body wt (g) | Spleen wt (g) | Spleen wt Body (%) | Spleen wt Brain (%) | Thymus wt (g) | Thymus wt Body (%) | Thymus wt Brain (%) | Brain wt (g) | Brain wt Body (%) | Brain wt Brain (%) |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | |
| 4516 | 1 | M | 40.3 | 0.1623 | 0.4027 | 12.10 | 0.1740 | 0.4318 | 12.97 | 1.3418 | 3.3295 | 100.00 |
| | 8 | F | 37.2 | 0.1495 | 0.4019 | 12.92 | 0.1809 | 0.4863 | 15.63 | 1.1573 | 3.1110 | 100.00 |
| 4517 | 1 | M | 39.5 | 0.1089 | 0.2757 | 7.81 | 0.1463 | 0.3704 | 10.49 | 1.3943 | 3.5299 | 100.00 |
| | 5 | F | 39.5 | 0.1320 | 0.3342 | 9.55 | 0.1584 | 0.4010 | 11.46 | 1.3826 | 3.5003 | 100.00 |
| 4518 | 2 | M | 44.7 | 0.2210 | 0.4944 | 15.48 | 0.1961 | 0.4387 | 13.73 | 1.4280 | 3.1946 | 100.00 |
| | 1 | F | 46.4 | 0.2073 | 0.4468 | 14.92 | 0.2027 | 0.4369 | 14.59 | 1.3895 | 2.9946 | 100.00 |
| 4521 | 1 | M | 38.0 | 0.1416 | 0.3726 | 9.81 | 0.1872 | 0.4926 | 12.97 | 1.4437 | 3.7992 | 100.00 |
| | 8 | F | 39.1 | 0.1293 | 0.3307 | 9.57 | 0.1640 | 0.4194 | 12.13 | 1.3518 | 3.4573 | 100.00 |
| 4522 | 1 | M | 37.7 | 0.1554 | 0.4122 | 11.03 | 0.1751 | 0.4645 | 12.43 | 1.4083 | 3.7355 | 100.00 |
| | 9 | F | 36.9 | 0.1066 | 0.2889 | 7.97 | 0.1343 | 0.3640 | 10.04 | 1.3381 | 3.6263 | 100.00 |
| 4523 | 1 | M | 31.0 | 0.0835 | 0.2694 | 6.29 | 0.1292 | 0.4168 | 9.74 | 1.3265 | 4.2790 | 100.00 |
| | 6 | F | 34.3 | 0.1023 | 0.2983 | 7.36 | 0.1542 | 0.4496 | 11.09 | 1.3907 | 4.0545 | 100.00 |
| 4524 | 1 | M | 40.0 | 0.1305 | 0.3263 | 9.32 | 0.1887 | 0.4718 | 13.47 | 1.4008 | 3.5020 | 100.00 |
| | 5 | F | 39.5 | 0.1530 | 0.3873 | 11.16 | 0.1890 | 0.4785 | 13.78 | 1.3712 | 3.4714 | 100.00 |
| 4525 | 1 | M | 38.2 | 0.1926 | 0.5042 | 14.22 | 0.1750 | 0.4581 | 12.92 | 1.3543 | 3.5453 | 100.00 |
| | 8 | F | 37.3 | 0.1989 | 0.5332 | 14.87 | 0.1976 | 0.5298 | 14.77 | 1.3374 | 3.5855 | 100.00 |
| 4526 | 1 | M | 32.8 | 0.0769 | 0.2345 | 5.71 | 0.1383 | 0.4216 | 10.27 | 1.3462 | 4.1043 | 100.00 |
| | 9 | F | 30.3 | 0.0969 | 0.3198 | 7.71 | 0.1376 | 0.4541 | 10.96 | 1.2560 | 4.1452 | 100.00 |

| | Parental histopathology - individual findings | Appendix 24 |
|---|---|---|

| Group /Sex | Animal Number | Phase Day | Phase | Tissue | Findings |
|---|---|---|---|---|---|
| 1M | 1001ts | 21 | Postmating | All examined tissues | No histopathology findings |
| | 1002ts | 21 | Postmating | All examined tissues | No histopathology findings |
| | 1003ts | 21 | Postmating | Prostate | Infiltrate, Inflammatory Cell, minimal, multifocal, lymphocytic/mononuclear cells, interstitium |
| | | | | Adrenals; Epididymides; Lungs and Bronchi; Pituitary; Seminal Vesicles; Testes | No histopathology findings |
| | 1004ts | 21 | Postmating | All examined tissues | No histopathology findings |
| | 1005ts | 21 | Postmating | Lungs and Bronchi | Alveolar Macrophage Aggregation, minimal, multifocal |
| | | | | Prostate | Infiltrate, Inflammatory Cell, minimal, multifocal |
| | | | | Adrenals; Epididymides; Pituitary; Seminal Vesicles; Testes | No histopathology findings |
| | 1006ts | 21 | Postmating | All examined tissues | No histopathology findings |

ts - terminal sacrifice

| | Parental histopathology - individual findings | Appendix 24 |
|---|---|---|

| Group /Sex | Animal Number | Phase Day | Phase | Tissue | Findings |
|---|---|---|---|---|---|
| 1M | 1007ts | 21 | Postmating | All examined tissues | No histopathology findings |
| | 1008ts | 21 | Postmating | Lungs and Bronchi | Alveolar Macrophage Aggregation, slight, multifocal |
| | | | | Skin and Subcutis | Hyperplasia, Epidermal, slight, focal<br>Scab(s), slight, focal<br>Note: Histo correlates to gross finding of: Scab, Head, Red |
| | | | | Adrenals; Epididymides; Pituitary; Prostate; Seminal Vesicles; Testes | No histopathology findings |
| | 1009ts | 21 | Postmating | All examined tissues | No histopathology findings |
| | 1010ts | 21 | Postmating | All examined tissues | No histopathology findings |
| | 1019ts | 21 | Postmating | Lungs and Bronchi | No histopathology findings<br>Note: No histo correlate for gross finding of: Discolored, Left Lobe(s), Red, Foci |
| 2M | 2003ts | 21 | Postmating | Thymus | Hemorrhage, Agonal, present<br>Note: Histo correlate to gross finding of:Discolored, Red, Foci |

ts - terminal sacrifice

| | Parental histopathology - individual findings | Appendix 24 |
|---|---|---|

| Group /Sex | Animal Number | Phase Day | Phase | Tissue | Findings |
|---|---|---|---|---|---|
| 2M | 2004ts | 21 | Postmating | Lungs and Bronchi | Hemorrhage, Agonal, present<br>Note: Histo correlate to gross finding of: Discolored, Red, Accessory Lobe |
| | 2012ts | 23 | Postmating | Epididymides | Sperm, Absent, present, unilateral<br>Note: Histo correlate to gross finding of Soft, Left |
| | | | | Testes | Degeneration/Atrophy, Tubular, marked, unilateral<br>Note: Histo correlate to gross finding of: Soft, Left |
| | 2014ts | 23 | Postmating | Kidneys | Cyst(s), Cortical, slight, focal, unilateral<br>Note: Histo correlate to gross finding of: Cyst, Right, Clear, Fluid |
| 3M | 3002u4 | 39 | Precohabitation | Lungs and Bronchi | Pulmonary Fibrosis, Pleura, slight, multifocal |
| | | | | Major Factor(s) contributing to death | Undetermined, present |
| | | | | Adrenals; Epididymides; Pituitary; Prostate; Seminal Vesicles; Testes | No histopathology findings |

u4 - humane euthanasia, ts - terminal sacrifice

| | Parental histopathology - individual findings | Appendix 24 |
|---|---|---|

| Group /Sex | Animal Number | Phase Day | Phase | Tissue | Findings |
|---|---|---|---|---|---|
| 3M | 3016ts | 23 | Postmating | Lungs and Bronchi | No histopathology findings<br>Note: No histo correlate to gross finding of: Discolored, Right Lobes, Pale, Foci |
| | 3018ts | 23 | Postmating | Thymus | Hemorrhage, Agonal, present<br>Note: Histo correlate to gross finding of:Discolored, Red, Foci |
| 4M | 4001ts | 21 | Postmating | Lungs and Bronchi | Alveolar Macrophage Aggregation, minimal, multifocal (some pigmented macrophages) |
| | | | | Adrenals; Epididymides; Pituitary; Prostate; Seminal Vesicles; Testes | No histopathology findings |
| | 4002ts | 21 | Postmating | All examined tissues | No histopathology findings |
| | 4003ts | 21 | Postmating | Lungs and Bronchi | Alveolar Macrophage Aggregation, minimal, multifocal (some pigmented macrophages) |
| | | | | Adrenals; Epididymides; Pituitary; Prostate; Seminal Vesicles; Testes | No histopathology findings |
| | 4004ts | 21 | Postmating | Pituitary | No histopathology findings |

ts - terminal sacrifice

| | Parental histopathology - individual findings | Appendix 24 |
|---|---|---|

| Group /Sex | Animal Number | Phase Day | Phase | Tissue | Findings |
|---|---|---|---|---|---|
| 4M | 4004ts | 21 | Postmating | Pituitary | Note: Only pars distalis present |
| | | | | Adrenals; Epididymides; Lungs and Bronchi; Prostate; Seminal Vesicles; Testes | No histopathology findings |
| | 4005ts | 21 | Postmating | Adrenals | Vacuolation, Cortical, minimal, diffuse, zona fasciculata |
| | | | | Epididymides; Lungs and Bronchi; Pituitary; Prostate; Seminal Vesicles; Testes | No histopathology findings |
| | 4006ts | 21 | Postmating | All examined tissues | No histopathology findings |
| | 4007ts | 21 | Postmating | All examined tissues | No histopathology findings |
| | 4008ts | 21 | Postmating | All examined tissues | No histopathology findings |
| | 4009ts | 23 | Postmating | All examined tissues | No histopathology findings |
| | 4010ts | 23 | Postmating | All examined tissues | No histopathology findings |

ts - terminal sacrifice

| | Parental histopathology - individual findings | Appendix 24 |
|---|---|---|

| Group /Sex | Animal Number | Phase Day | Phase | Tissue | Findings |
|---|---|---|---|---|---|
| 4M | 4015ts | 23 | Postmating | Lungs and Bronchi | Pulmonary Acinar Ectasia, present<br>Note: Histo correlate to gross finding of: Cyst, Left Lobe(s), Clear |

ts - terminal sacrifice

| | Parental histopathology - individual findings | Appendix 24 |
|---|---|---|

| Group /Sex | Animal Number | Phase Day | Phase | Tissue | Findings |
|---|---|---|---|---|---|
| 1F | 1501ts | 22 | Lactation | Adrenals | Vacuolation, Cortical, slight, focal, unilateral, zona fasciculata |
| | | | | Pituitary | No histopathology findings<br>Note: Only pars distalis present |
| | | | | Lungs and Bronchi; Ovaries; Uterus; Vagina | No histopathology findings |
| | 1502ts | 22 | Lactation | All examined tissues | No histopathology findings |
| | 1503ts | 22 | Lactation | Lungs and Bronchi | Alveolar Macrophage Aggregation, slight, multifocal |
| | | | | Adrenals; Ovaries; Pituitary; Uterus; Vagina | No histopathology findings |
| | 1504ts | 25 | Gestation | All examined tissues | No histopathology findings |
| | 1505ts | 22 | Lactation | Lungs and Bronchi | Alveolar Macrophage Aggregation, minimal, multifocal |
| | | | | Adrenals; Ovaries; Pituitary; Uterus; Vagina | No histopathology findings |

ts - terminal sacrifice

| | Parental histopathology - individual findings | Appendix 24 |
|---|---|---|

| Group /Sex | Animal Number | Phase Day | Phase | Tissue | Findings |
|---|---|---|---|---|---|
| 1F | 1506ts | 22 | Lactation | All examined tissues | No histopathology findings |
| | 1507ts | 22 | Lactation | All examined tissues | No histopathology findings |
| | 1508ts | 22 | Lactation | Lungs and Bronchi | Alveolar Macrophage Aggregation, minimal, multifocal |
| | | | | Adrenals; Ovaries; Pituitary; Uterus; Vagina | No histopathology findings |
| | 1510ts | 22 | Lactation | All examined tissues | No histopathology findings |
| | 1511ts | 22 | Lactation | Lungs and Bronchi | Alveolar Macrophage Aggregation, minimal, multifocal |
| | | | | Adrenals; Ovaries; Pituitary; Uterus; Vagina | No histopathology findings |
| | 1514ts | 22 | Lactation | Skeletal Muscle | M-fibrosarcoma, forelimb(s), incidental<br>Note: Histo correlate to gross finding of: Mass(es), Right, Forelimb, Tan, Firm |
| | 1516ts | 22 | Lactation | Pituitary | No histopathology findings |

ts - terminal sacrifice

| | Parental histopathology - individual findings | Appendix 24 |
|---|---|---|

| Group /Sex | Animal Number | Phase Day | Phase | Tissue | Findings |
|---|---|---|---|---|---|
| 1F | 1516ts | 22 | Lactation | Pituitary | Note: No histo correlate to gross finding of: Small |
| 2F | 2506tll | 2 | Lactation | Lungs and Bronchi | Alveolar Macrophage Aggregation, slight, focal (with golden brown granular cytoplasmic pigmented particles)<br>Note: Histo correlate to gross finding of: Discolored, Black, Area |
| | 2518ts | 25 | Gestation | Ileum | Diverticulum, present, focal<br>Note: Histo correlate to gross finding of:Diverticulum |
| 3F | 3501ts | 22 | Lactation | Jejunum | Diverticulum, present, focal<br>Note: Histo correlate to gross finding of:Diverticulum |
| | 3515ts | 22 | Lactationt | Thymus | Lymphoid Depletion, slight<br>Note: Histo correlate to gross finding of: Small |
| 4F | 4501ts | 22 | Lactation | All examined tissues | No histopathology findings |
| | 4502ts | 22 | Lactation | All examined tissues | No histopathology findings |

ts - terminal sacrifice, tll - total litter loss

| | Parental histopathology - individual findings | Appendix 24 |
|---|---|---|

| Group /Sex | Animal Number | Phase Day | Phase | Tissue | Findings |
|---|---|---|---|---|---|
| 4F | 4503ts | 22 | Lactation | Lungs and Bronchi | Alveolar Macrophage Aggregation, minimal, multifocal |
| | | | | Adrenals; Ovaries; Pituitary; Uterus; Vagina | No histopathology findings |
| | 4504ts | 22 | Lactation | Lungs and Bronchi | Alveolar Macrophage Aggregation, minimal, multifocal |
| | | | | Stomach | Erosion, Nonglandular Region, slight, focal<br>Note: Histo correlate to gross finding of Abnormal Contents, Non-glandular mucosa, Red, Material |
| | | | | Adrenals; Ovaries; Pituitary; Uterus; Vagina | No histopathology findings |
| | 4505ts | 22 | Lactation | All examined tissues | No histopathology findings |
| | 4506ts | 25 | Gestation | All examined tissues | No histopathology findings |
| | 4507u1 | 22 | Gestation | Lungs and Bronchi | Hemorrhage, Agonal, present, multifocal<br>Note: Histo correlate to gross finding of:Discolored, Black, Mottled |

u1 - found dead, ts - terminal sacrifice

| | Parental histopathology - individual findings | Appendix 24 |
|---|---|---|

| Group /Sex | Animal Number | Phase Day | Phase | Tissue | Findings |
|---|---|---|---|---|---|
| 4F | 4507u1 | 22 | Gestation | Major Factor(s) contributing to death | Undetermined, present |
| | | | | Adrenals; Ovaries; Pituitary; Uterus; Vagina | No histopathology findings |
| | 4508ts | 22 | Lactation | All examined tissues | No histopathology findings |
| | 4509ts | 118 (17) | Treatment | Lungs and Bronchi | Alveolar Macrophage Aggregation, minimal, multifocal |
| | | | | Adrenals; Ovaries; Pituitary; Uterus; Vagina | No histopathology findings |
| | 4510ts | 22 | Lactation | Lungs and Bronchi | Alveolar Macrophage Aggregation, minimal, multifocal |
| | | | | Adrenals; Ovaries; Pituitary; Uterus; Vagina | No histopathology findings |
| | 4514ts | 25 | Gestation | Lungs and Bronchi | Hemorrhage, Agonal, present, focal<br>Note: Histo correlate to gross finding of: Discolored, Red, Area |

u1 - found dead, ts - terminal sacrifice

| | Parental histopathology - individual findings | Appendix 24 |
|---|---|---|

| Group /Sex | Animal Number | Phase Day | Phase | Tissue | Findings |
|---|---|---|---|---|---|
| 4F | 4525ts | 22 | Lactation | Lungs and Bronchi | Alveolar Macrophage Aggregation, slight, multifocal<br>Note: Histo correlate to gross finding of:Discolored, Tan, Foci |

ts - terminal sacrifice

| Males | Sperm analysis - individual values - sperm motility | Appendix 25 |
|---|---|---|

| Animal number | Motility | | | Cauda epididymis | | | Testis | | |
|---|---|---|---|---|---|---|---|---|---|
| | Motile sperm (%) | Progressively motile sperm % | Number of sperm analyzed | Weight (g) | Sperm count (millions/g) | Total (million) | Weight (g) | Sperm count (millions/g) | Total (million) |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | |
| 1001 | 96 | 65 | 222 | 0.3412 | 108 | 37 | 1.8120 | 23 | 41 |
| 1002 | 95 | 67 | 252 | 0.3912 | 117 | 46 | 2.0571 | 24 | 50 |
| 1003 | 98 | 60 | 326 | 0.3738 | 77 | 29 | 1.7985 | 15 | 27 |
| 1004 | 97 | 68 | 211 | 0.3454 | 71 | 25 | 2.0729 | 12 | 25 |
| 1005 | 99 | 81 | 288 | 0.3508 | 56 | 20 | 1.8831 | 24 | 46 |
| 1006 | 98 | 68 | 222 | 0.3537 | 111 | 39 | 1.8677 | 15 | 29 |
| 1007 | 100 | 79 | 287 | 0.3405 | 35 | 12 | 1.6691 | 13 | 22 |
| 1008 | 93 | 59 | 200 | 0.3474 | 59 | 21 | 1.7838 | 17 | 30 |
| 1009 | 98 | 71 | 259 | 0.3545 | 56 | 20 | 1.9380 | 19 | 37 |
| 1010 | 88 | 52 | 378 | 0.2848 | 114 | 32 | 1.7510 | 21 | 37 |
| 1011 | 95 | 59 | 281 | 0.3607 | 73 | 26 | 1.9994 | 25 | 49 |
| 1012 | 94 | 40 | 252 | 0.3520 | 100 | 35 | 2.1575 | 6 | 13 |
| 1013 | 98 | 74 | 269 | 0.3784 | 110 | 42 | 2.0563 | 9 | 19 |
| 1014 | 99 | 58 | 245 | 0.3711 | 32 | 12 | 1.9809 | 16 | 31 |
| 1015 | 100 | 77 | 257 | 0.3865 | 97 | 38 | 2.2288 | 11 | 24 |
| 1016 | 99 | 81 | 276 | 0.2947 | 82 | 24 | 1.8370 | 20 | 37 |
| 1017 | 89 | 61 | 312 | 0.3718 | 91 | 34 | 2.0115 | 11 | 22 |
| 1018 | 96 | 75 | 306 | 0.4860 | 59 | 29 | 2.4027 | 18 | 44 |
| 1019 | 100 | 71 | 272 | 0.2799 | 109 | 30 | 2.0774 | 20 | 41 |
| 1020 | 99 | 68 | 268 | 0.3586 | 19 | 7 | 2.0845 | 13 | 27 |
| 1021 | 93 | 52 | 290 | 0.3911 | 111 | 43 | 2.1387 | 20 | 43 |
| 1022 | 99 | 85 | 265 | 0.3383 | 58 | 20 | 1.9517 | 20 | 38 |
| 1023 | 98 | 70 | 264 | 0.3651 | 62 | 23 | 2.1597 | 22 | 47 |
| 1024 | 98 | 66 | 296 | 0.3933 | 111 | 44 | 2.0066 | 25 | 50 |
| 1025 | 98 | 78 | 266 | 0.3382 | 142 | 48 | 1.9725 | 22 | 44 |
| 1026 | 98 | 69 | 219 | 0.3434 | 86 | 29 | 2.0030 | 20 | 40 |

| Males | Sperm analysis - individual values - sperm motility | Appendix 25 |
|---|---|---|

| Animal number | Motility | | | Cauda epididymis | | | Testis | | |
|---|---|---|---|---|---|---|---|---|---|
| | Motile sperm (%) | P rogressively motile sperm % | Number of sperm analyzed | Weight (g) | Sperm count (millions/g) | Total (million) | Weight (g) | Sperm count (millions/g) | Total (million) |
| Group 2 - 2,000 mg/m$^3$ | | | | | | | | | |
| 2001 | 97 | 62 | 284 | 0.3281 | 127 | 42 | 1.6662 | 12 | 21 |
| 2002 | 99 | 64 | 201 | 0.3741 | 83 | 31 | 2.1367 | 17 | 36 |
| 2003 | 95 | 40 | 301 | 0.3687 | 87 | 32 | 1.9132 | 21 | 40 |
| 2004 | 86 | 48 | 313 | 0.2934 | 99 | 29 | 2.1067 | 18 | 39 |
| 2005 | 99 | 68 | 315 | 0.2850 | 108 | 31 | 1.8829 | 17 | 31 |
| 2006 | 93 | 71 | 206 | 0.3704 | 115 | 43 | 1.8710 | 25 | 46 |
| 2007 | 100 | 70 | 260 | 0.3086 | 76 | 23 | 1.9182 | 16 | 31 |
| 2008 | 97 | 69 | 239 | 0.3595 | 109 | 39 | 1.9813 | 18 | 36 |
| 2009 | 97 | 50 | 217 | 0.4152 | 52 | 22 | 2.0309 | 30 | 60 |
| 2010 | 97 | 78 | 276 | 0.2851 | 72 | 21 | 1.9430 | 19 | 38 |
| 2011 | 94 | 41 | 267 | 0.2942 | 52 | 15 | 1.9029 | 26 | 50 |
| 2012 | 99 | 43 | 283 | 0.3966 | 48 | 19 | 2.3035 | 16 | 37 |
| 2013 | 99 | 47 | 248 | 0.4346 | 126 | 55 | 2.1497 | 17 | 37 |
| 2014 | 94 | 47 | 259 | 0.2776 | 71 | 20 | 1.8712 | 19 | 35 |
| 2015 | 97 | 74 | 305 | 0.3295 | 54 | 18 | 1.9542 | 22 | 44 |
| 2016 | 99 | 72 | 252 | 0.3157 | 119 | 37 | 1.7371 | 9 | 16 |
| 2017 | 99 | 85 | 265 | 0.3028 | 80 | 24 | 1.9337 | 13 | 25 |
| 2018 | 99 | 73 | 297 | 0.3268 | 92 | 30 | 1.9423 | 8 | 16 |
| 2019 | 99 | 61 | 298 | 0.3583 | 115 | 41 | 2.1845 | 21 | 46 |
| 2020 | 98 | 63 | 250 | 0.3868 | 111 | 43 | 2.0495 | 23 | 47 |
| 2021 | 99 | 52 | 246 | 0.3472 | 92 | 32 | 2.1443 | 19 | 42 |
| 2022 | 99 | 82 | 235 | 0.3832 | 82 | 31 | 1.8660 | 21 | 39 |
| 2023 | 99 | 64 | 273 | 0.4217 | 75 | 32 | 2.3964 | 27 | 64 |
| 2024 | 98 | 61 | 261 | 0.3984 | 55 | 22 | 2.0475 | 25 | 51 |
| 2025 | 96 | 65 | 242 | 0.4289 | 102 | 44 | 1.8490 | 22 | 40 |
| 2026 | 95 | 59 | 387 | 0.4388 | 76 | 34 | 2.0519 | 22 | 45 |

| Males | Sperm analysis - individual values - sperm motility | Appendix 25 |
|---|---|---|

| Animal number | Motility | | | Cauda epididymis | | | Testis | | |
|---|---|---|---|---|---|---|---|---|---|
| | Motile sperm (%) | Progressively motile sperm % | Number of sperm analyzed | Weight (g) | Sperm count (millions/g) | Total (million) | Weight (g) | Sperm count (millions/g) | Total (million) |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | |
| 3001 | 99 | 76 | 232 | 0.4181 | 117 | 49 | 2.1616 | 11 | 25 |
| 3003 | 95 | 68 | 227 | 0.3178 | 83 | 26 | 1.8988 | 16 | 31 |
| 3004 | 98 | 56 | 293 | 0.3225 | 60 | 19 | 2.0254 | 23 | 46 |
| 3005 | 98 | 60 | 244 | 0.3358 | 129 | 43 | 1.9606 | 23 | 46 |
| 3006 | 97 | 75 | 389 | 0.4173 | 102 | 43 | 1.9187 | 20 | 39 |
| 3007 | 98 | 55 | 322 | 0.3225 | 37 | 12 | 1.9061 | 15 | 28 |
| 3008 | 99 | 64 | 222 | 0.3123 | 34 | 11 | 1.7764 | 23 | 41 |
| 3009 | 100 | 70 | 271 | 0.3628 | 115 | 42 | 1.9977 | 13 | 27 |
| 3010 | 98 | 80 | 263 | 0.4015 | 99 | 40 | 2.3949 | 19 | 45 |
| 3011 | 97 | 64 | 303 | 0.2964 | 55 | 16 | 2.1867 | 20 | 44 |
| 3012 | 100 | 44 | 206 | 0.3375 | 84 | 29 | 2.1099 | 14 | 29 |
| 3013 | 94 | 38 | 288 | 0.3339 | 152 | 51 | 2.0343 | 16 | 33 |
| 3014 | 99 | 72 | 437 | 0.3153 | 31 | 10 | 1.8580 | 10 | 18 |
| 3015 | 96 | 49 | 285 | 0.3610 | 45 | 16 | 1.7701 | 32 | 56 |
| 3016 | 96 | 69 | 292 | 0.4512 | 102 | 46 | 2.0545 | 24 | 50 |
| 3017 | 97 | 63 | 300 | 0.3139 | 127 | 40 | 1.9178 | 17 | 32 |
| 3018 | 93 | 73 | 235 | 0.3515 | 53 | 19 | 1.9763 | 16 | 32 |
| 3019 | 100 | 60 | 210 | 0.4299 | 102 | 44 | 2.2508 | 18 | 40 |
| 3020 | 93 | 66 | 300 | 0.3830 | 131 | 50 | 2.2080 | 21 | 46 |
| 3021 | 97 | 59 | 303 | 0.4352 | 152 | 66 | 2.2009 | 15 | 33 |
| 3022 | 99 | 63 | 271 | 0.3556 | 183 | 65 | 2.2058 | 21 | 46 |
| 3023 | 96 | 65 | 342 | 0.4067 | 93 | 38 | 2.1276 | 18 | 39 |
| 3024 | 97 | 39 | 251 | 0.4433 | 105 | 46 | 1.9816 | 20 | 39 |
| 3025 | 90 | 64 | 233 | 0.4183 | 140 | 59 | 1.8829 | 18 | 33 |
| 3026 | 100 | 61 | 219 | 0.3985 | 90 | 36 | 1.9625 | 19 | 38 |

| Males | Sperm analysis - individual values - sperm motility | Appendix 25 |
|---|---|---|

| Animal number | Motility | | | Cauda epididymis | | | Testis | | |
|---|---|---|---|---|---|---|---|---|---|
| | Motile sperm (%) | Progressively motile sperm % | Number of sperm analyzed | Weight (g) | Sperm count (millions/g) | Total (million) | Weight (g) | Sperm count (millions/g) | Total (million) |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | |
| 4001 | 99 | 80 | 288 | 0.2354 | 67 | 16 | 1.7590 | 19 | 34 |
| 4002 | 95 | 75 | 336 | 0.3239 | 131 | 43 | 1.9447 | 21 | 40 |
| 4003 | 99 | 64 | 257 | 0.4410 | 44 | 19 | 2.2615 | 19 | 44 |
| 4004 | 99 | 68 | 284 | 0.3474 | 80 | 28 | 1.8168 | 18 | 32 |
| 4005 | 98 | 65 | 474 | 0.4274 | 78 | 33 | 2.1422 | 19 | 41 |
| 4006 | 91 | 61 | 328 | 0.4423 | 112 | 50 | 2.2120 | 21 | 47 |
| 4007 | 99 | 68 | 286 | 0.3353 | 122 | 41 | 1.9061 | 14 | 26 |
| 4008 | 98 | 52 | 304 | 0.4261 | 158 | 67 | 2.1805 | 12 | 25 |
| 4009 | 97 | 68 | 261 | 0.3196 | 70 | 23 | 2.0378 | 8 | 16 |
| 4010 | 88 | 66 | 311 | 0.2935 | 116 | 34 | 1.9336 | 22 | 42 |
| 4011 | 98 | 69 | 278 | 0.4189 | 64 | 27 | 2.2078 | 14 | 31 |
| 4012 | 97 | 60 | 252 | 0.3478 | 125 | 43 | 2.1919 | 21 | 45 |
| 4013 | 97 | 71 | 306 | 0.2974 | 68 | 20 | 1.8651 | 21 | 40 |
| 4014 | 91 | 57 | 345 | 0.2827 | 55 | 16 | 2.0371 | 17 | 35 |
| 4015 | 96 | 77 | 283 | 0.3308 | 39 | 13 | 2.1669 | 15 | 33 |
| 4016 | 99 | 67 | 273 | 0.4004 | 90 | 36 | 1.9793 | 5 | 10 |
| 4017 | 96 | 82 | 223 | 0.3314 | 101 | 34 | 1.7854 | 25 | 45 |
| 4018 | 99 | 79 | 276 | 0.3253 | 59 | 19 | 1.8478 | 25 | 46 |
| 4019 | 98 | 79 | 275 | 0.3892 | 132 | 52 | 2.0078 | 14 | 27 |
| 4020 | 97 | 72 | 312 | 0.3499 | 66 | 23 | 1.9025 | 21 | 39 |
| 4021 | 99 | 61 | 252 | 0.3959 | 69 | 28 | 2.1480 | 19 | 42 |
| 4022 | 99 | 69 | 282 | 0.4610 | 100 | 46 | 2.4583 | 18 | 43 |
| 4023 | 93 | 39 | 323 | 0.3518 | 89 | 31 | 1.8912 | 29 | 55 |
| 4024 | 100 | 51 | 397 | 0.3382 | 112 | 38 | 1.4091 | 17 | 24 |
| 4025 | 97 | 66 | 256 | 0.3521 | 93 | 33 | 1.8342 | 18 | 32 |
| 4026 | 96 | 71 | 261 | 0.3585 | 93 | 34 | 1.8431 | 24 | 44 |

| Males | Sperm analysis - individual values - sperm morphology | Appendix 25 |
|---|---|---|

| | | | Normal | | | Decapitate | | | Head abnormal | | | Neck abnormal | | | Tail abnormal | | | Mid tail blob | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Animal number | Number of sperm examined | Total per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | |
| 1001 | 200 | 200 | 195 | | | | | | 2 | | | | | | 1 | | | 2 | | |
| | | 200 | | 195 | 97.5 | | 0 | 0.0 | | 2 | 1.0 | | 0 | 0.0 | | 1 | 0.5 | | 2 | 1.0 |
| 1002 | 200 | 200 | 180 | | | 1 | | | | | | | | | 1 | | | 18 | | |
| | | 200 | | 180 | 90.0 | | 1 | 0.5 | | 0 | 0.0 | | 0 | 0.0 | | 1 | 0.5 | | 18 | 9.0 |
| 1003 | 200 | 200 | 200 | | | | | | | | | | | | | | | | | |
| | | 200 | | 200 | 100.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 |
| 1004 | 200 | 200 | 193 | | | | | | | | | | | | 5 | | | 2 | | |
| | | 200 | | 193 | 96.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 5 | 2.5 | | 2 | 1.0 |
| 1005 | 200 | 200 | 192 | | | | | | 1 | | | | | | 3 | | | 4 | | |
| | | 200 | | 192 | 96.0 | | 0 | 0.0 | | 1 | 0.5 | | 0 | 0.0 | | 3 | 1.5 | | 4 | 2.0 |
| 1006 | 200 | 200 | 196 | | | | | | | | | | | | 1 | | | 3 | | |
| | | 200 | | 196 | 98.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 1 | 0.5 | | 3 | 1.5 |
| 1007 | 200 | 200 | 197 | | | | | | | | | | | | 1 | | | 2 | | |
| | | 200 | | 197 | 98.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 1 | 0.5 | | 2 | 1.0 |
| 1008 | 200 | 200 | 196 | | | | | | 1 | | | | | | | | | 3 | | |
| | | 200 | | 196 | 98.0 | | 0 | 0.0 | | 1 | 0.5 | | 0 | 0.0 | | 0 | 0.0 | | 3 | 1.5 |
| 1009 | 200 | 200 | 199 | | | | | | | | | | | | | | | 1 | | |
| | | 200 | | 199 | 99.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 1 | 0.5 |
| 1010 | 200 | 200 | 194 | | | 1 | | | 3 | | | 1 | | | 1 | | | | | |
| | | 200 | | 194 | 97.0 | | 1 | 0.5 | | 3 | 1.5 | | 1 | 0.5 | | 1 | 0.5 | | 0 | 0.0 |
| 1011 | 200 | 200 | 197 | | | 3 | | | | | | | | | | | | | | |
| | | 200 | | 197 | 98.5 | | 3 | 1.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 |
| 1012 | 200 | 200 | 196 | | | 2 | | | | | | | | | 2 | | | | | |
| | | 200 | | 196 | 98.0 | | 2 | 1.0 | | 0 | 0.0 | | 0 | 0.0 | | 2 | 1.0 | | 0 | 0.0 |
| 1013 | 200 | 200 | 197 | | | 1 | | | 1 | | | | | | | | | 1 | | |
| | | 200 | | 197 | 98.5 | | 1 | 0.5 | | 1 | 0.5 | | 0 | 0.0 | | 0 | 0.0 | | 1 | 0.5 |

| Males | Sperm analysis - individual values - sperm morphology | Appendix 25 |
|---|---|---|

| | | | Normal | | | Decapitate | | | Head abnormal | | | Neck abnormal | | | Tail abnormal | | | Mid tail blob | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Animal number | Number of sperm examined | Total per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal |
| Group 1 - 0 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | |
| 1014 | 200 | 200 | 198 | | | 1 | | | | | | | | | 1 | | | | | |
| | | 200 | | 198 | 99.0 | | 1 | 0.5 | | 0 | 0.0 | | 0 | 0.0 | | 1 | 0.5 | | 0 | 0.0 |
| 1015 | 200 | 200 | 196 | | | 1 | | | | | | | | | | | | 3 | | |
| | | 200 | | 196 | 98.0 | | 1 | 0.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 3 | 1.5 |
| 1016 | 200 | 200 | 200 | | | | | | | | | | | | | | | | | |
| | | 200 | | 200 | 100.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 |
| 1017 | 200 | 200 | 198 | | | | | | | | | | | | | | | 2 | | |
| | | 200 | | 198 | 99.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 2 | 1.0 |
| 1018 | 200 | 200 | 189 | | | | | | 2 | | | | | | | | | 9 | | |
| | | 200 | | 189 | 94.5 | | 0 | 0.0 | | 2 | 1.0 | | 0 | 0.0 | | 0 | 0.0 | | 9 | 4.5 |
| 1019 | 200 | 200 | 200 | | | | | | | | | | | | | | | | | |
| | | 200 | | 200 | 100.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 |
| 1020 | 200 | 200 | 200 | | | | | | | | | | | | | | | | | |
| | | 200 | | 200 | 100.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 |
| 1021 | 200 | 200 | 200 | | | | | | | | | | | | | | | | | |
| | | 200 | | 200 | 100.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 |
| 1022 | 200 | 200 | 196 | | | 1 | | | 1 | | | | | | 1 | | | 1 | | |
| | | 200 | | 196 | 98.0 | | 1 | 0.5 | | 1 | 0.5 | | 0 | 0.0 | | 1 | 0.5 | | 1 | 0.5 |
| 1023 | 200 | 200 | 195 | | | 1 | | | | | | | | | 4 | | | | | |
| | | 200 | | 195 | 97.5 | | 1 | 0.5 | | 0 | 0.0 | | 0 | 0.0 | | 4 | 2.0 | | 0 | 0.0 |
| 1024 | 200 | 200 | 196 | | | | | | | | | | | | 3 | | | 1 | | |
| | | 200 | | 196 | 98.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 3 | 1.5 | | 1 | 0.5 |
| 1025 | 200 | 200 | 191 | | | | | | | | | | | | | | | 9 | | |
| | | 200 | | 191 | 95.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 9 | 4.5 |
| 1026 | 200 | 200 | 196 | | | | | | | | | | | | | | | 4 | | |
| | | 200 | | 196 | 98.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 4 | 2.0 |

| Males | Sperm analysis - individual values - sperm morphology | Appendix 25 |
|---|---|---|

| | | | Normal | | | Decapitate | | | Head abnormal | | | Neck abnormal | | | Tail abnormal | | | Mid tail blob | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Animal number | Number of sperm examined | Total per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal |
| Group 2 -2,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | |
| 2001 | 200 | 200 | 194 | | | 1 | | | 1 | | | | | | | | | 4 | | |
| | | 200 | | 194 | 97.0 | | 1 | 0.5 | | 1 | 0.5 | | 0 | 0.0 | | 0 | 0.0 | | 4 | 2.0 |
| 2002 | 200 | 200 | 192 | | | 2 | | | 2 | | | | | | 1 | | | 3 | | |
| | | 200 | | 192 | 96.0 | | 2 | 1.0 | | 2 | 1.0 | | 0 | 0.0 | | 1 | 0.5 | | 3 | 1.5 |
| 2003 | 200 | 200 | 193 | | | | | | 2 | | | 1 | | | 1 | | | 3 | | |
| | | 200 | | 193 | 96.5 | | 0 | 0.0 | | 2 | 1.0 | | 1 | 0.5 | | 1 | 0.5 | | 3 | 1.5 |
| 2004 | 200 | 200 | 195 | | | | | | 2 | | | | | | 3 | | | | | |
| | | 200 | | 195 | 97.5 | | 0 | 0.0 | | 2 | 1.0 | | 0 | 0.0 | | 3 | 1.5 | | 0 | 0.0 |
| 2005 | 200 | 200 | 198 | | | 2 | | | | | | | | | | | | | | |
| | | 200 | | 198 | 99.0 | | 2 | 1.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 |
| 2006 | 200 | 200 | 198 | | | | | | | | | | | | 2 | | | | | |
| | | 200 | | 198 | 99.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 2 | 1.0 | | 0 | 0.0 |
| 2007 | 200 | 200 | 199 | | | | | | 1 | | | | | | | | | | | |
| | | 200 | | 199 | 99.5 | | 0 | 0.0 | | 1 | 0.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 |
| 2008 | 200 | 200 | 197 | | | 1 | | | 1 | | | | | | | | | 1 | | |
| | | 200 | | 197 | 98.5 | | 1 | 0.5 | | 1 | 0.5 | | 0 | 0.0 | | 0 | 0.0 | | 1 | 0.5 |
| 2009 | 200 | 200 | 199 | | | | | | 1 | | | | | | | | | | | |
| | | 200 | | 199 | 99.5 | | 0 | 0.0 | | 1 | 0.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 |
| 2010 | 200 | 200 | 198 | | | | | | | | | | | | | | | 2 | | |
| | | 200 | | 198 | 99.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 2 | 1.0 |
| 2011 | 200 | 200 | 200 | | | | | | | | | | | | | | | | | |
| | | 200 | | 200 | 100.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 |
| 2012 | 200 | 200 | 193 | | | 2 | | | 2 | | | | | | 3 | | | | | |
| | | 200 | | 193 | 96.5 | | 2 | 1.0 | | 2 | 1.0 | | 0 | 0.0 | | 3 | 1.5 | | 0 | 0.0 |
| 2013 | 200 | 200 | 197 | | | 1 | | | 2 | | | | | | | | | | | |
| | | 200 | | 197 | 98.5 | | 1 | 0.5 | | 2 | 1.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 |

| Males | Sperm analysis - individual values - sperm morphology | Appendix 25 |
|---|---|---|

| | | | Normal | | | Decapitate | | | Head abnormal | | | Neck abnormal | | | Tail abnormal | | | Mid tail blob | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Animal number | Number of sperm examined | Total per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal |
| Group 2 -2,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | |
| 2014 | 180 | 200 | 180 | | | | | | | | | | | | | | | | | |
| | 20 | 200 | 19 | 199 | 99.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | 1 | 1 | 0.5 | | 0 | 0.0 |
| 2015 | 200 | 200 | 194 | | | | | | 2 | | | | | | 1 | | | 3 | | |
| | | 200 | | 194 | 97.0 | | 0 | 0.0 | | 2 | 1.0 | | 0 | 0.0 | | 1 | 0.5 | | 3 | 1.5 |
| 2016 | 200 | 200 | 196 | | | 1 | | | 1 | | | | | | | | | 2 | | |
| | | 200 | | 196 | 98.0 | | 1 | 0.5 | | 1 | 0.5 | | 0 | 0.0 | | 0 | 0.0 | | 2 | 1.0 |
| 2017 | 200 | 200 | 196 | | | | | | 1 | | | | | | | | | 3 | | |
| | | 200 | | 196 | 98.0 | | 0 | 0.0 | | 1 | 0.5 | | 0 | 0.0 | | 0 | 0.0 | | 3 | 1.5 |
| 2018 | 200 | 200 | 196 | | | | | | | | | | | | | | | 4 | | |
| | | 200 | | 196 | 98.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 4 | 2.0 |
| 2019 | 200 | 200 | 199 | | | | | | 1 | | | | | | | | | | | |
| | | 200 | | 199 | 99.5 | | 0 | 0.0 | | 1 | 0.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 |
| 2020 | 200 | 200 | 185 | | | | | | | | | | | | | | | 15 | | |
| | | 200 | | 185 | 92.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 15 | 7.5 |
| 2021 | 200 | 200 | 200 | | | | | | | | | | | | | | | | | |
| | | 200 | | 200 | 100.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 |
| 2022 | 200 | 200 | 199 | | | | | | | | | | | | | | | 1 | | |
| | | 200 | | 199 | 99.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 1 | 0.5 |
| 2023 | 200 | 200 | 185 | | | 2 | | | 1 | | | | | | 1 | | | 11 | | |
| | | 200 | | 185 | 92.5 | | 2 | 1.0 | | 1 | 0.5 | | 0 | 0.0 | | 1 | 0.5 | | 11 | 5.5 |
| 2024 | 200 | 200 | 199 | | | 1 | | | | | | | | | | | | | | |
| | | 200 | | 199 | 99.5 | | 1 | 0.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 |
| 2025 | 200 | 200 | 192 | | | | | | 2 | | | | | | | | | 6 | | |
| | | 200 | | 192 | 96.0 | | 0 | 0.0 | | 2 | 1.0 | | 0 | 0.0 | | 0 | 0.0 | | 6 | 3.0 |
| 2026 | 200 | 200 | 199 | | | | | | | | | 1 | | | | | | | | |
| | | 200 | | 199 | 99.5 | | 0 | 0.0 | | 0 | 0.0 | | 1 | 0.5 | | 0 | 0.0 | | 0 | 0.0 |

| Males | Sperm analysis - individual values - sperm morphology | Appendix 25 |
|---|---|---|

| | | | Normal | | | Decapitate | | | Head abnormal | | | Neck abnormal | | | Tail abnormal | | | Mid tail blob | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Animal number | Number of sperm examined | Total per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | |
| 3001 | 200 | 200 | 199 | | | | | | 1 | | | | | | | | | | | |
| | | 200 | | 199 | 99.5 | | 0 | 0.0 | | 1 | 0.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 |
| 3003 | 200 | 200 | 194 | | | | | | 3 | | | 1 | | | | | | 2 | | |
| | | 200 | | 194 | 97.0 | | 0 | 0.0 | | 3 | 1.5 | | 1 | 0.5 | | 0 | 0.0 | | 2 | 1.0 |
| 3004 | 200 | 200 | 190 | | | 3 | | | 2 | | | 2 | | | 3 | | | | | |
| | | 200 | | 190 | 95.0 | | 3 | 1.5 | | 2 | 1.0 | | 2 | 1.0 | | 3 | 1.5 | | 0 | 0.0 |
| 3005 | 200 | 200 | 194 | | | 3 | | | | | | | | | 3 | | | | | |
| | | 200 | | 194 | 97.0 | | 3 | 1.5 | | 0 | 0.0 | | 0 | 0.0 | | 3 | 1.5 | | 0 | 0.0 |
| 3006 | 200 | 200 | 194 | | | | | | 1 | | | | | | 5 | | | | | |
| | | 200 | | 194 | 97.0 | | 0 | 0.0 | | 1 | 0.5 | | 0 | 0.0 | | 5 | 2.5 | | 0 | 0.0 |
| 3007 | 200 | 200 | 197 | | | | | | | | | | | | 1 | | | 2 | | |
| | | 200 | | 197 | 98.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 1 | 0.5 | | 2 | 1.0 |
| 3008 | 200 | 200 | 197 | | | 2 | | | 1 | | | | | | | | | | | |
| | | 200 | | 197 | 98.5 | | 2 | 1.0 | | 1 | 0.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 |
| 3009 | 200 | 200 | 187 | | | | | | 4 | | | | | | 2 | | | 7 | | |
| | | 200 | | 187 | 93.5 | | 0 | 0.0 | | 4 | 2.0 | | 0 | 0.0 | | 2 | 1.0 | | 7 | 3.5 |
| 3010 | 200 | 200 | 197 | | | | | | 1 | | | | | | | | | 2 | | |
| | | 200 | | 197 | 98.5 | | 0 | 0.0 | | 1 | 0.5 | | 0 | 0.0 | | 0 | 0.0 | | 2 | 1.0 |
| 3011 | 200 | 200 | 198 | | | 1 | | | | | | | | | | | | 1 | | |
| | | 200 | | 198 | 99.0 | | 1 | 0.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 1 | 0.5 |
| 3012 | 200 | 200 | 199 | | | | | | | | | | | | 1 | | | | | |
| | | 200 | | 199 | 99.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 1 | 0.5 | | 0 | 0.0 |
| 3013 | 200 | 200 | 197 | | | 1 | | | | | | | | | 1 | | | 1 | | |
| | | 200 | | 197 | 98.5 | | 1 | 0.5 | | 0 | 0.0 | | 0 | 0.0 | | 1 | 0.5 | | 1 | 0.5 |
| 3014 | 200 | 200 | 199 | | | | | | | | | | | | | | | 1 | | |
| | | 200 | | 199 | 99.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 1 | 0.5 |

| Males | Sperm analysis - individual values - sperm morphology | Appendix 25 |
|---|---|---|

| | | | Normal | | | Decapitate | | | Head abnormal | | | Neck abnormal | | | Tail abnormal | | | Mid tail blob | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Animal number | Number of sperm examined | Total per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal |
| Group 3 - 10,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | |
| 3015 | 200 | 200 | 196 | | | | | | 1 | | | 1 | | | 1 | | | 1 | | |
| | | 200 | | 196 | 98.0 | | 0 | 0.0 | | 1 | 0.5 | | 1 | 0.5 | | 1 | 0.5 | | 1 | 0.5 |
| 3016 | 200 | 200 | 198 | | | | | | 1 | | | | | | 1 | | | | | |
| | | 200 | | 198 | 99.0 | | 0 | 0.0 | | 1 | 0.5 | | 0 | 0.0 | | 1 | 0.5 | | 0 | 0.0 |
| 3017 | 200 | 200 | 184 | | | | | | | | | 1 | | | | | | 15 | | |
| | | 200 | | 184 | 92.0 | | 0 | 0.0 | | 0 | 0.0 | | 1 | 0.5 | | 0 | 0.0 | | 15 | 7.5 |
| 3018 | 200 | 200 | 196 | | | | | | 1 | | | | | | 1 | | | 2 | | |
| | | 200 | | 196 | 98.0 | | 0 | 0.0 | | 1 | 0.5 | | 0 | 0.0 | | 1 | 0.5 | | 2 | 1.0 |
| 3019 | 200 | 200 | 191 | | | 2 | | | 2 | | | 1 | | | | | | 4 | | |
| | | 200 | | 191 | 95.5 | | 2 | 1.0 | | 2 | 1.0 | | 1 | 0.5 | | 0 | 0.0 | | 4 | 2.0 |
| 3020 | 200 | 200 | 197 | | | | | | | | | 2 | | | 1 | | | | | |
| | | 200 | | 197 | 98.5 | | 0 | 0.0 | | 0 | 0.0 | | 2 | 1.0 | | 1 | 0.5 | | 0 | 0.0 |
| 3021 | 200 | 200 | 199 | | | | | | | | | | | | 1 | | | | | |
| | | 200 | | 199 | 99.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 1 | 0.5 | | 0 | 0.0 |
| 3022 | 200 | 200 | 193 | | | 1 | | | | | | | | | 3 | | | 3 | | |
| | | 200 | | 193 | 96.5 | | 1 | 0.5 | | 0 | 0.0 | | 0 | 0.0 | | 3 | 1.5 | | 3 | 1.5 |
| 3023 | 200 | 200 | 197 | | | | | | | | | | | | | | | 3 | | |
| | | 200 | | 197 | 98.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 3 | 1.5 |
| 3024 | 200 | 200 | 194 | | | 2 | | | | | | | | | 3 | | | 1 | | |
| | | 200 | | 194 | 97.0 | | 2 | 1.0 | | 0 | 0.0 | | 0 | 0.0 | | 3 | 1.5 | | 1 | 0.5 |
| 3025 | 200 | 200 | 194 | | | 2 | | | | | | | | | | | | 4 | | |
| | | 200 | | 194 | 97.0 | | 2 | 1.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 4 | 2.0 |
| 3026 | 200 | 200 | 200 | | | | | | | | | | | | | | | | | |
| | | 200 | | 200 | 100.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 |

| Males | Sperm analysis - individual values - sperm morphology | Appendix 25 |
|---|---|---|

| | | | Normal | | | Decapitate | | | Head abnormal | | | Neck abnormal | | | Tail abnormal | | | Mid tail blob | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Animal number | Number of sperm examined | Total per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | |
| 4001 | 200 | 200 | 195 | | | 2 | | | | | | 1 | | | | | | 2 | | |
| | | 200 | | 195 | 97.5 | | 2 | 1.0 | | 0 | 0.0 | | 1 | 0.5 | | 0 | 0.0 | | 2 | 1.0 |
| 4002 | 200 | 200 | 196 | | | 2 | | | | | | | | | | | | 2 | | |
| | | 200 | | 196 | 98.0 | | 2 | 1.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 2 | 1.0 |
| 4003 | 200 | 200 | 200 | | | | | | | | | | | | | | | | | |
| | | 200 | | 200 | 100.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 |
| 4004 | 200 | 200 | 194 | | | | | | | | | | | | | | | 6 | | |
| | | 200 | | 194 | 97.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 6 | 3.0 |
| 4005 | 200 | 200 | 193 | | | | | | | | | | | | 6 | | | 1 | | |
| | | 200 | | 193 | 96.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 6 | 3.0 | | 1 | 0.5 |
| 4006 | 200 | 200 | 199 | | | | | | | | | | | | | | | 1 | | |
| | | 200 | | 199 | 99.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 1 | 0.5 |
| 4007 | 200 | 200 | 200 | | | | | | | | | | | | | | | | | |
| | | 200 | | 200 | 100.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 |
| 4008 | 200 | 200 | 199 | | | | | | | | | | | | | | | 1 | | |
| | | 200 | | 199 | 99.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 1 | 0.5 |
| 4009 | 200 | 200 | 181 | | | 2 | | | 2 | | | | | | 9 | | | 6 | | |
| | | 200 | | 181 | 90.5 | | 2 | 1.0 | | 2 | 1.0 | | 0 | 0.0 | | 9 | 4.5 | | 6 | 3.0 |
| 4010 | 200 | 200 | 197 | | | | | | | | | 1 | | | 2 | | | | | |
| | | 200 | | 197 | 98.5 | | 0 | 0.0 | | 0 | 0.0 | | 1 | 0.5 | | 2 | 1.0 | | 0 | 0.0 |
| 4011 | 200 | 200 | 197 | | | | | | 1 | | | | | | | | | 2 | | |
| | | 200 | | 197 | 98.5 | | 0 | 0.0 | | 1 | 0.5 | | 0 | 0.0 | | 0 | 0.0 | | 2 | 1.0 |
| 4012 | 200 | 200 | 199 | | | | | | | | | | | | | | | 1 | | |
| | | 200 | | 199 | 99.5 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 1 | 0.5 |
| 4013 | 200 | 200 | 200 | | | | | | | | | | | | | | | | | |
| | | 200 | | 200 | 100.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 |

| Males | Sperm analysis - individual values - sperm morphology | Appendix 25 |
|---|---|---|

| | | | Normal | | | Decapitate | | | Head abnormal | | | Neck abnormal | | | Tail abnormal | | | Mid tail blob | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Animal number | Number of sperm examined | Total per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal | # per slide | # per animal | % per animal |
| Group 4 - 20,000 mg/m$^3$ | | | | | | | | | | | | | | | | | | | | |
| 4014 | 200 | 200 | 183 | | | 15 | | | 1 | | | | | | 1 | | | | | |
| | | 200 | | 183 | 91.5 | | 15 | 7.5 | | 1 | 0.5 | 0 | 0.0 | | 1 | 0.5 | | 0 | 0.0 |
| 4015 | 200 | 200 | 196 | | | | | | 1 | | | | | | 1 | | | 2 | | |
| | | 200 | | 196 | 98.0 | | 0 | 0.0 | | 1 | 0.5 | 0 | 0.0 | | 1 | 0.5 | | 2 | 1.0 |
| 4016 | 200 | 200 | 195 | | | | | | | | | | | | | | | 5 | | |
| | | 200 | | 195 | 97.5 | | 0 | 0.0 | | 0 | 0.0 | 0 | 0.0 | | 0 | 0.0 | | 5 | 2.5 |
| 4017 | 200 | 200 | 188 | | | 1 | | | | | | | | | | | | 11 | | |
| | | 200 | | 188 | 94.0 | | 1 | 0.5 | | 0 | 0.0 | 0 | 0.0 | | 0 | 0.0 | | 11 | 5.5 |
| 4018 | 200 | 200 | 195 | | | 2 | | | 1 | | | | | | 1 | | | 1 | | |
| | | 200 | | 195 | 97.5 | | 2 | 1.0 | | 1 | 0.5 | 0 | 0.0 | | 1 | 0.5 | | 1 | 0.5 |
| 4019 | 200 | 200 | 194 | | | | | | | | | | | | | | | 6 | | |
| | | 200 | | 194 | 97.0 | | 0 | 0.0 | | 0 | 0.0 | 0 | 0.0 | | 0 | 0.0 | | 6 | 3.0 |
| 4020 | 200 | 200 | 198 | | | | | | 1 | | | | | | 1 | | | | | |
| | | 200 | | 198 | 99.0 | | 0 | 0.0 | | 1 | 0.5 | 0 | 0.0 | | 1 | 0.5 | | 0 | 0.0 |
| 4021 | 200 | 200 | 198 | | | | | | | | | | | | | | | 2 | | |
| | | 200 | | 198 | 99.0 | | 0 | 0.0 | | 0 | 0.0 | 0 | 0.0 | | 0 | 0.0 | | 2 | 1.0 |
| 4022 | 200 | 200 | 192 | | | | | | 1 | | | | | | | | | 7 | | |
| | | 200 | | 192 | 96.0 | | 0 | 0.0 | | 1 | 0.5 | 0 | 0.0 | | 0 | 0.0 | | 7 | 3.5 |
| 4023 | 200 | 200 | 196 | | | | | | 1 | | | | | | 1 | | | 2 | | |
| | | 200 | | 196 | 98.0 | | 0 | 0.0 | | 1 | 0.5 | 0 | 0.0 | | 1 | 0.5 | | 2 | 1.0 |
| 4024 | 200 | 200 | 194 | | | 5 | | | | | | | | | 1 | | | | | |
| | | 200 | | 194 | 97.0 | | 5 | 2.5 | | 0 | 0.0 | 0 | 0.0 | | 1 | 0.5 | | 0 | 0.0 |
| 4025 | 200 | 200 | 191 | | | | | | 2 | | | | | | 2 | | | 5 | | |
| | | 200 | | 191 | 95.5 | | 0 | 0.0 | | 2 | 1.0 | 0 | 0.0 | | 2 | 1.0 | | 5 | 2.5 |
| 4026 | 200 | 200 | 196 | | | | | | | | | | | | 4 | | | | | |
| | | 200 | | 196 | 98.0 | | 0 | 0.0 | | 0 | 0.0 | 0 | 0.0 | | 4 | 2.0 | | 0 | 0.0 |

# Annex 1 Gasoline analysis

108_141022_002 VC-Run 1970 distillate batch 1.txt
CHEVRON RESEARCH GASOLINE ANALYSIS
ASTM DHAX METHOD

Sample ID: VC-Run 1970 distillate batch 1
Acquisition Date & Time: 10/22/2014 9:32:40 AM
Channel: C108 (Offline)
Analysis: 108_141022_002.dat

*** DETAILED COMPOSITION, PERCENT ***

| C NO. | PARA | OLEF | NAPH | AROM | UNCL HC | TOTALS BY C # | NORMAL PARA | NON-ALKYL I-PARA | ALKYL I-PARA | CYCLO-PENT | CYCLO-HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| => | BY WEIGHT | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 7.14 | **** | **** | **** | 2.82 | 9.97 | 0.30 | 6.84 | **** | **** | **** |
| 5 | 66.96 | **** | 4.97 | **** | **** | 71.93 | 0.20 | 66.76 | **** | 4.97 | **** |
| 6 | 3.68 | **** | 0.22 | **** | **** | 3.90 | 0.60 | 3.07 | **** | 0.18 | 0.04 |
| 7 | 0.98 | **** | 0.01 | **** | **** | 1.00 | **** | 0.98 | **** | **** | 0.01 |
| 8 | 12.91 | **** | 0.13 | **** | **** | 13.03 | 0.03 | 0.50 | 12.37 | **** | 0.13 |
| 9 | 0.02 | **** | 0.07 | 0.09 | **** | 0.18 | 0.01 | 0.01 | **** | 0.02 | 0.05 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 91.69 | **** | 5.40 | 0.09 | 2.82 | 100.00 | 1.15 | 78.17 | 12.37 | 5.18 | 0.22 |
| => | BY VOLUME | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 8.12 | **** | **** | **** | 2.29 | 10.41 | 0.33 | 7.79 | **** | **** | **** |
| 5 | 68.72 | **** | 4.25 | **** | **** | 72.97 | 0.20 | 68.52 | **** | 4.25 | **** |
| 6 | 3.58 | **** | 0.19 | **** | **** | 3.77 | 0.58 | 3.00 | **** | 0.16 | 0.03 |
| 7 | 0.91 | **** | 0.01 | **** | **** | 0.92 | **** | 0.91 | **** | **** | 0.01 |
| 8 | 11.69 | **** | 0.10 | **** | **** | 11.79 | 0.03 | 0.46 | 11.20 | **** | 0.10 |
| 9 | 0.02 | **** | 0.06 | 0.07 | **** | 0.14 | 0.01 | 0.01 | **** | 0.02 | 0.04 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 93.04 | **** | 4.60 | 0.07 | 2.29 | 100.00 | 1.15 | 80.69 | 11.20 | 4.42 | 0.18 |
| => | BY MOLAR | | | | | | | | | | |
| 3- | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 4 | 9.16 | **** | **** | **** | 3.62 | 12.78 | 0.38 | 8.78 | **** | **** | **** |
| 5 | 69.19 | **** | 5.28 | **** | **** | 74.48 | 0.21 | 68.99 | **** | 5.28 | **** |
| 6 | 3.18 | **** | 0.20 | **** | **** | 3.38 | 0.52 | 2.66 | **** | 0.16 | 0.03 |
| 7 | 0.73 | **** | 0.01 | **** | **** | 0.74 | **** | 0.73 | **** | **** | 0.01 |
| 8 | 8.42 | **** | 0.08 | **** | **** | 8.51 | 0.02 | 0.33 | 8.08 | **** | 0.08 |
| 9 | 0.01 | **** | 0.04 | 0.06 | **** | 0.11 | 0.01 | 0.01 | **** | 0.01 | 0.03 |
| 10 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 11 | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 12+ | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| TOT | 90.71 | **** | 5.61 | 0.06 | 3.62 | 100.00 | 1.14 | 81.49 | 8.08 | 5.46 | 0.15 |

GRP. TYPE, VOL %: P = 95.22, O = 0.00, N = 4.71, A = 0.07, Saturates = 99.93
DIENE CONTENT = 0 vol ppm AVG MW= 74.6 API GR.= 89.2 SP. GR.= 0.6411
OCTANE NUMBER: (from pure values) RON = 94.0 MON = 90.9
(from blending values) RON = 92.5 MON = 88.4
CARBON-HYDROGEN RATIO = 5.041 STOICH. AIR-FUEL RATIO = 15.25 lbs air/lbs fuel
BTU/lb = 19253 NET, 20735 GROSS; BTU/gal = 103002 NET, 110929 GROSS
REID VAPOR PRESSURE = 21.7 BROMINE NO. = 0.0

* DISTILLATION CURVES

108_141022_002 VC-Run 1970 distillate batch 1.txt

| VOL % | TBP | D86 |
|---|---|---|
| 0 | 11 | 83 |
| 5 | 11 | 83 |
| 10 | 82 | 83 |
| 15 | 82 | 83 |
| 20 | 82 | 83 |
| 25 | 82 | 83 |
| 30 | 82 | 83 |
| 35 | 82 | 83 |
| 40 | 82 | 83 |
| 45 | 82 | 83 |
| 50 | 82 | 83 |
| 55 | 82 | 83 |
| 60 | 82 | 83 |
| 65 | 82 | 83 |
| 70 | 82 | 83 |
| 75 | 82 | 83 |
| 80 | 121 | 121 |
| 85 | 181 | 181 |
| 90 | 211 | 210 |
| 95 | 211 | 238 |
| 100 | 337 | 238 |

* COMPOUND DICTIONARY NUMBERS AND AREAS AS READ IN

| CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA | CODE | AREA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 157883 | 4 | 6872 | 8 | 4974 | 7 | 1546917 | 6 | 4632 |
| 12 | 52022 | 800 | 118832 | 13 | 1771 | 10 | 9361 | 11 | 8555 |
| 9 | 14122 | 801 | 4383 | 18 | 854 | 20 | 1176 | 1009 | 59009 |
| 825 | 896 | 19 | 13594 | 15 | 4269 | 16 | 3166 | 37 | 184060 |
| 826 | 262 | 36 | 2298 | 31 | 6287 | 30 | 4663 | 39 | 3308 |
| 38 | 100926 | 34 | 430 | 24 | 400 | 831 | 1218 | 848 | 546 |
| 830 | 595 | 832 | 427 | 23 | 685 | 827 | 817 | 946 | 297 |
| 956 | 496 | 61 | 213 | 941 | 290 | 41 | 342 | 609 | 697 |
| 610 | 417 | 613 | 329 | 612 | 866 | | | | |

TOTAL UNCORRECTED AREA = 2324157
NUMBER OF PEAKS READ IN = 43

* DETAILED HYDROCARBON ANALYSIS, EXCLUDING COMPOUNDS BELOW 0.01 VOLUME PERCENT

NORMAL PARAFFINS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 4 | 0.38 | 0.33 | 0.30 | N-BUTANE |
| 6 | 0.21 | 0.20 | 0.20 | N-PENTANE |
| 9 | 0.52 | 0.58 | 0.60 | N-HEXANE |
| 23 | 0.02 | 0.03 | 0.03 | N-OCTANE |
| 41 | 0.01 | 0.01 | 0.01 | N-NONANE |

ISO-PARAFFINS

108_141022_002 VC-Run 1970 distillate batch 1.txt

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 5 | 8.78 | 7.79 | 6.84 | ISOBUTANE | |
| 8 | 0.22 | 0.23 | 0.21 | 22-DIME PROPANE | |
| 7 | 68.77 | 68.29 | 66.54 | ISOPENTANE | |
| 12 | 1.93 | 2.18 | 2.23 | 22-DIME BUTANE | |
| 13 | 0.07 | 0.07 | 0.08 | 23-DIME BUTANE | |
| 10 | 0.35 | 0.39 | 0.40 | 2-ME PENTANE | |
| 11 | 0.32 | 0.35 | 0.37 | 3-ME PENTANE | |
| 18 | 0.03 | 0.03 | 0.04 | 22-DIME PENTANE | |
| 20 | 0.04 | 0.05 | 0.05 | 24-DIME PENTANE | |
| 19 | 0.43 | 0.53 | 0.58 | 23-DIME PENTANE | |
| 15 | 0.14 | 0.17 | 0.18 | 2-ME HEXANE | |
| 16 | 0.10 | 0.13 | 0.14 | 3-ME HEXANE | |
| 37 | 5.12 | 7.22 | 7.84 | 224-TRIME PENTANE | * |
| 36 | 0.06 | 0.09 | 0.10 | 223-TRIME PENTANE | * |
| 31 | 0.17 | 0.25 | 0.27 | 25-DIME HEXANE | |
| 30 | 0.13 | 0.18 | 0.20 | 24-DIME HEXANE | |
| 39 | 0.09 | 0.12 | 0.14 | 234-TRIME PENTANE | * |
| 38 | 2.81 | 3.77 | 4.30 | 233-TRIME PENTANE | * |
| 34 | 0.01 | 0.02 | 0.02 | 2-ME-3-ET PENTANE | |
| 24 | 0.01 | 0.02 | 0.02 | 2-ME HEPTANE | |

CYCLOPENTANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 800 | 5.28 | 4.25 | 4.97 | CYCLOPENTANE |
| 801 | 0.16 | 0.16 | 0.18 | ME CYCLOPENTANE |
| 848 | 0.01 | 0.02 | 0.02 | 113T4-TETRME CPENT |

CYCLOHEXANES

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 825 | 0.03 | 0.03 | 0.04 | CYCLOHEXANE |
| 831 | 0.03 | 0.04 | 0.05 | 1C3-DIME CYCHEXANE |
| 830 | 0.02 | 0.02 | 0.02 | 1T2-DIME CYCHEXANE |
| 832 | 0.01 | 0.01 | 0.02 | 1T3-DIME CYCHEXANE |
| 827 | 0.02 | 0.03 | 0.03 | ETHYL CYCLOHEXANE |
| 946 | 0.01 | 0.01 | 0.01 | 113-TRIME CYCHEXANE |
| 956 | 0.01 | 0.02 | 0.02 | 1C3T5-TRIME CYCHEX |

AROMATIC HCS

| CODE | MOL. | VOL. | WT. | NAME | |
|---|---|---|---|---|---|
| 609 | 0.02 | 0.02 | 0.03 | 1-ME-3-ET BENZENE | |
| 610 | 0.01 | 0.01 | 0.02 | 1-ME-4-ET BENZENE | |
| 612 | 0.02 | 0.03 | 0.03 | 124-TRIME BENZENE | * |

UNCLASSIFIED HCS

| CODE | MOL. | VOL. | WT. | NAME |
|---|---|---|---|---|
| 1009 | 3.62 | 2.29 | 2.82 | ISOBUTANOL |

## Annex 2 Formulation analysis report

# Analytical Report

# Gasoline Isobutanol Vapor Condensate Analysis

# In Support of:

# Gasoline Isobutanol Vapor Condensate: A One-Generation Inhalation (Whole-Body) Reproduction Toxicity Study in Rats (GLP)

On 21 September 2015 the legal entity Huntingdon Life Sciences, Inc was renamed as Envigo CRS, Inc. No other changes to the legal entity have occurred.

| | |
|---|---|
| **Envigo study number:** | 14-4417 |
| **Method number:** | HLS-005-15R2 |
| **Version:** | Final Report |
| **Issue date:** | 23 March 2016 |

# Sponsor and Testing Facility Details

| | |
|---|---|
| **Sponsor** | Butamax Advanced Biofuels, LLC<br>200 Powder Mill Road<br>E356 Third Floor<br>Wilmington, DE 19880-0356<br>USA |
| **Testing Facility** | Envigo CRS, Inc.<br>Princeton Research Center<br>P.O. Box 2360<br>East Millstone, NJ 08875-2360<br>USA |

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# Signatures

## Gasoline Isobutanol Vapor Condensate Analysis

## Study Management

The [redacted]

[redacted] 23 Mar 16

[redacted] Date

Contributing Scientist
Formulation and Inhalation Analysis
Envigo

## Scientific Review and Approval

The following scientist has reviewed and approved this report:

[redacted] 23/mar/16

Nicki Iacono, BS Date

Vice President
Bioanalytical and Translational Sciences
Envigo

# Study Personnel

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Lin Wang, MS
Analyst
Formulation and Inhalation Analysis

# General Preface

This section provides a key to abbreviations and formulas commonly used throughout this report.

## List of Abbreviations

| | |
|---|---|
| $CS_2$ | Carbon disulfide |
| GC | Gas chromatography |
| FIA | Formulation and Inhalation Analysis |
| FID | Flame ionization detection |
| HLS | Huntingdon Life Sciences |
| $mg/m^3$ | milligram/cubic meter |
| µm | micrometer |
| m | meter |
| mm | millimeter |
| mV | millivolt |
| min | minute |
| PRC | Princeton Research Center |

# Summary

Samples of the test substance (Gasoline Isobutanol Vapor Condensate) were analyzed to characterize at least ten major components (comprising at least 80% by weight of the test substance) to show test substance stability and comparison between the neat liquid test substance and the vaporized test atmospheres. The analytical method (HLS-005-15R2) was validated at Envigo in Study No. 15-8287. The method involved the extraction of Gasoline Isobutanol Vapor Condensate from charcoal tubes with Carbon Disulfide ($CS_2$). The major components of the test substance were then characterized (relative area percent) utilizing Gas Chromatography with Flame Ionization Detection (FID).

# 1. Experimental Procedures

The charcoal tubes from each exposure chamber were received from the Inhalation Department at Envigo. These samples were analyzed to determine the percent of total peak area of the major components of Gasoline Isobutanol Vapor Condensate listed in method HLS-005-15R2. The samples were extracted with Carbon Disulfide ($CS_2$). The extracted solutions were analyzed by Gas Chromatography equipped with a Supelco Petrocol™ DH 150 (150 m x 0.25 mm, 1.0 µm) column and Flame Ionization Detector (FID).

# 2. Materials

**Test substance:** Gasoline Isobutanol Vapor Condensate (Neat Material)

**Control vehicle (matrix):** Charcoal tube

# 3. Analysis

The analytical method (HLS-005-15R2) was validated by the department of Formulation and Inhalation Analysis at Envigo in Study No. 15-8287. Details of the analytical method and method validation are maintained in the study file for Study No. 15-8287.

## 3.1. Exposure concentration determination

During each exposure, one charcoal tube sample per chamber pretest and per week was analyzed by gas chromatography to characterize at least 10 major components (comprising at least 80% by weight of the test substance) to show test substance stability and provide a comparison between the neat liquid test substance and the vaporized test atmospheres. The charcoal tubes were stored refrigerated (2 to 8ºC) for up to 7 days (based on stability assessment in Envigo Study No. 15-8287) unless extracted and analyzed on the same day of collection.

# 4. Data Acquisition and Integration

All data collection, processing and storage were performed using the Perkin-Elmer Nelson TotalChrom version 6.2.1 installed on a personal computer.

# 5. Good Laboratory Practices

The study was conducted in compliance with the following Good Laboratory Practice standards:

United States Environmental Protection Agency 79.60, CFR Vol. 59, No. 122, 27 June 1994

# 6. Archiving of Data

All data documenting experimental details, study procedures and observations were recorded and maintained as raw data in appropriate laboratory binders. At the completion of the study, all reports and raw data will be maintained in the archives of Envigo for a period of 1 year after the submission of the signed final report. Testing Facility-generated electronic raw data will be stored on the computer system on which the data application resides or archived off-line.

# 7. Results and Discussion

A summary of analytical runs is presented in Table 1. Typical GC chromatograms of Groups 1 through 4 are shown in Figure 1, Figure 2, Figure 3 and Figure 4.

Samples taken during the exposures were analyzed to determine the percent peak area of the test substance's major components in the chamber. The results of spiked control samples are presented in Table 2 and animal exposure results are presented in Table 3 through Table 20.

**Table 1 Analytical run summary**

| Date of Analysis | Analytical Run Number | Description |
|---|---|---|
| 18-23 March 2015 | 001 | Pretest and Exposure Day 2 |
| 25-26 March 2015 | 002 | Room Air, Hallway Air and Exposure Day 8 |
| 31 March 2015, 01-02 April 2015 | 003 | Exposure Day 15 |
| 08-09 April 2015 | 004 | Exposure Day 22 |
| 14-15 April 2015 | 005 | Exposure Day 29 |
| 22-23 April 2015 | 006 | Exposure Day 36 |
| 28-29 April 2015 | 007 | Exposure Day 43 |
| 06-07 May 2015 | 008 | Exposure Day 50 |
| 13-14 May 2015 | 009 | Exposure Day 57 |
| 19-20 May 2015 | 010 | Exposure Day 64 |
| 27-28 May 2015 | 011 | Exposure Day 71 |
| 03-04 June 2015 | 012 | Exposure Day 78 |
| 10-11 June 2015 | 013 | Exposure Day 85 |
| 16-17 June 2015 | 014 | Exposure Day 92 |
| 24-25 June 2015 | 015 | Exposure Day 99 |
| 02-03 July 2015 | 016 | Exposure Day 106 |
| 09-10 July 2015 | 017 | Exposure Day 113 |

**Table 2 Spiked control samples**

(% Peak Area)

| Component ID | Pretest and Exposure Day 2 | | | Exposure Day 8 | | Exposure Day 15 | | Exposure Day 22 | |
|---|---|---|---|---|---|---|---|---|---|
| | Spiked Control A | Spiked Control B | Spiked Control B[1] | Spiked Control A | Spiked Control B | Spiked Control A | Spiked Control B | Spiked Control A | Spiked Control B |
| Isobutane | 5.3 | 0.0 | 4.2 | 6.6 | 6.8 | 5.3 | 5.1 | 6.4 | 5.9 |
| N-Butane | 0.2 | 0.0 | 0.2 | 0.3 | 0.0 | 0.2 | 0.2 | 0.3 | 0.3 |
| 2-Methylbutane | 63.5 | 100[2] | 59.3 | 64.0 | 64.4 | 63.6 | 63.6 | 64.1 | 63.7 |
| N-Pentane | 0.2 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 2.4 | 0.0 | 2.6 | 2.3 | 2.3 | 2.4 | 2.4 | 2.4 | 2.4 |
| Cyclopentane | 5.6 | 7.0 | 5.9 | 5.4 | 5.4 | 5.6 | 5.6 | 5.5 | 5.5 |
| 2-Methylpentane | 0.5 | 0.0 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| 3-Methylpentane | 0.4 | 0.0 | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.7 | 0.0 | 0.8 | 0.7 | 0.7 | 0.8 | 0.8 | 0.7 | 0.7 |
| Isobutanol | 2.8 | 0.0 | 2.7 | 2.7 | 2.7 | 2.4 | 2.4 | 2.4 | 2.4 |
| Methylcyclopentane | 0.2 | 0.0 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.3 | 0.0 | 0.3 | 0.2 | 0.2 | 0.3 | 0.3 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.8 | 0.0 | 1.0 | 0.7 | 0.7 | 0.8 | 0.8 | 0.8 | 0.8 |
| 3-Methylhexane | 0.2 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2,4-Trimethylpentane | 11.0 | 0.0 | 13.7 | 10.3 | 10.2 | 11.3 | 11.3 | 10.7 | 11.0 |
| 2,3,3-trimethylpentane | 5.8 | 0.0 | 7.6 | 5.2 | 5.1 | 5.9 | 5.9 | 5.2 | 5.6 |

[1]Re-injected

[2]Insufficient sample volume in sample vial. Recovery tube inserted and sample re-analyzed.

**Table 2 (continued) Spiked control samples**

(% Peak Area)

| Component ID | Exposure Day 29 | | Exposure Day 36 | | Exposure Day 43 | | Exposure Day 50 | |
|---|---|---|---|---|---|---|---|---|
| | Spiked Control A | Spiked Control B | Spiked Control A | Spiked Control B | Spiked Control A | Spiked Control B | Spiked Control A | Spiked Control B |
| Isobutane | 4.8 | 5.1 | 5.7 | 5.2 | 4.0 | 4.1 | 4.4 | 5.7 |
| N-Butane | 0.2 | 0.2 | 0.3 | 0.2 | 0.2 | 0.2 | 0.0 | 0.3 |
| 2-Methylbutane | 63.4 | 63.6 | 64.0 | 63.2 | 62.1 | 62.4 | 63.5 | 64.2 |
| N-Pentane | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 2.5 | 2.4 | 2.4 | 2.4 | 2.5 | 2.5 | 2.5 | 2.4 |
| Cyclopentane | 5.8 | 5.7 | 5.6 | 5.6 | 6.0 | 5.9 | 5.9 | 5.6 |
| 2-Methylpentane | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| 3-Methylpentane | 0.5 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.4 |
| N-Hexane | 0.8 | 0.7 | 0.7 | 0.7 | 0.8 | 0.8 | 0.8 | 0.7 |
| Isobutanol | 2.6 | 2.6 | 2.3 | 2.7 | 2.9 | 2.7 | 2.4 | 2.3 |
| Methylcyclopentane | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.2 |
| 2-Methylhexane | 0.3 | 0.2 | 0.0 | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 |
| 2,3-Dimethylpentane | 0.8 | 0.8 | 0.8 | 0.8 | 0.9 | 0.9 | 0.8 | 0.8 |
| 3-Methylhexane | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2,4-Trimethylpentane | 11.5 | 11.1 | 11.2 | 11.5 | 12.3 | 12.2 | 11.8 | 10.8 |
| 2,3,3-trimethylpentane | 5.8 | 5.9 | 5.5 | 5.7 | 6.5 | 6.4 | 5.9 | 5.4 |

**Table 2 (continued) Spiked control samples**

(% Peak Area)

| Component ID | Exposure Day 57 | | Exposure Day 64 | | Exposure Day 71 | | Exposure Day 78 | |
|---|---|---|---|---|---|---|---|---|
| | Spiked Control A | Spiked Control B | Spiked Control A | Spiked Control B | Spiked Control A | Spiked Control B | Spiked Control A | Spiked Control B |
| Isobutane | 5.9 | 6.0 | 5.5 | 5.7 | 5.8 | 6.0 | 6.9 | 6.7 |
| N-Butane | 0.3 | 0.3 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 65.5 | 65.7 | 64.7 | 65.0 | 66.0 | 66.3 | 65.6 | 65.2 |
| N-Pentane | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 2.4 | 2.4 | 2.5 | 2.5 | 2.5 | 2.4 | 2.3 | 2.3 |
| Cyclopentane | 5.6 | 5.5 | 5.7 | 5.6 | 5.6 | 5.5 | 5.4 | 5.3 |
| 2-Methylpentane | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.4 | 0.4 |
| 3-Methylpentane | 0.4 | 0.4 | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.7 | 0.7 | 0.8 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 |
| Isobutanol | 1.9 | 2.2 | 2.4 | 2.4 | 2.2 | 2.1 | 2.1 | 2.3 |
| Methylcyclopentane | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.7 | 0.7 | 0.8 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 |
| 3-Methylhexane | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2,4-Trimethylpentane | 10.2 | 9.9 | 10.6 | 10.3 | 9.8 | 9.6 | 9.7 | 9.7 |
| 2,3,3-trimethylpentane | 5.0 | 4.8 | 5.1 | 5.0 | 4.7 | 4.7 | 4.8 | 5.1 |

**Table 2 (continued) Spiked control samples**

(% Peak Area)

| Component ID | Exposure Day 85 | | Exposure Day 92 | | Exposure Day 99 | | Exposure Day 106 | |
|---|---|---|---|---|---|---|---|---|
| | Spiked Control A | Spiked Control B | Spiked Control A | Spiked Control B | Spiked Control A | Spiked Control B | Spiked Control A | Spiked Control B |
| Isobutane | 5.7 | 5.7 | 6.2 | 6.4 | 6.6 | 6.3 | 5.7 | 6.1 |
| N-Butane | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 | 0.3 |
| 2-Methylbutane | 64.1 | 64.0 | 64.9 | 65.1 | 65.5 | 65.6 | 64.9 | 65.3 |
| N-Pentane | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 |
| Cyclopentane | 5.5 | 5.6 | 5.5 | 5.4 | 5.5 | 5.5 | 5.6 | 5.5 |
| 2-Methylpentane | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| 3-Methylpentane | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 |
| Isobutanol | 2.4 | 2.4 | 2.5 | 2.4 | 2.3 | 2.3 | 2.5 | 2.5 |
| Methylcyclopentane | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.8 | 0.8 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 |
| 3-Methylhexane | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.0 |
| 2,2,4-Trimethylpentane | 10.7 | 10.8 | 10.0 | 9.8 | 9.7 | 9.8 | 10.4 | 10.1 |
| 2,3,3-trimethylpentane | 5.6 | 5.7 | 5.2 | 5.1 | 4.7 | 4.8 | 5.1 | 4.9 |

**Table 2 (continued)  Spiked control samples**

(% Peak Area)

| Component ID | Exposure Day 113 | |
|---|---|---|
| | Spiked Control A | Spiked Control B |
| Isobutane | 5.5 | 5.5 |
| N-Butane | 0.2 | 0.2 |
| 2-Methylbutane | 63.5 | 63.8 |
| N-Pentane | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 2.4 | 2.4 |
| Cyclopentane | 5.7 | 5.7 |
| 2-Methylpentane | 0.5 | 0.5 |
| 3-Methylpentane | 0.5 | 0.4 |
| N-Hexane | 0.8 | 0.7 |
| Isobutanol | 2.5 | 2.5 |
| Methylcyclopentane | 0.2 | 0.2 |
| 2-Methylhexane | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.8 | 0.8 |
| 3-Methylhexane | 0.2 | 0.2 |
| 2,2,4-Trimethylpentane | 11.1 | 11.0 |
| 2,3,3-trimethylpentane | 5.6 | 5.5 |

**Table 3 Chamber components confirmation: Pretest**

Sequence #: 001

(% Peak Area)

| Component ID | Group 1 101 | Group 2 201 | Group 3 301 | Group 4 401 |
|---|---|---|---|---|
| Isobutane | 12.1[1] | 7.7 | 8.3 | 8.4 |
| N-Butane | 0.0 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 87.9[1] | 65.8 | 65.5 | 65.8 |
| N-Pentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 2.3 | 2.2 | 2.2 |
| Cyclopentane | 0.0 | 5.3 | 5.2 | 5.1 |
| 2-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.6 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 2.3 | 2.3 | 2.2 |
| Methylcyclopentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.6 | 0.6 | 0.6 |
| 3-Methylhexane | 0.0 | 0.1 | 0.2 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 8.9 | 8.9 | 8.9 |
| 2,3,3-trimethylpentane | 0.0 | 4.6 | 4.4 | 4.3 |

[1]Signal < 2% of spiked control sample signal

**Table 4 Chamber components confirmation: Exposure Day 2**

Sequence #: 001

(% Peak Area)

| Component ID | Group 1 1001M | Group 2 2001M | Group 3 3001M | Group 4 4001M |
|---|---|---|---|---|
| Isobutane | 0.0 | 7.0 | 7.6 | 7.5 |
| N-Butane | 0.0 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 100[1] | 65.9 | 66.1 | 65.7 |
| N-Pentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 2.3 | 2.3 | 2.3 |
| Cyclopentane | 0.0 | 5.3 | 5.3 | 5.3 |
| 2-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.7 | 0.7 | 0.6 |
| Isobutanol | 0.0 | 2.0 | 1.9 | 2.2 |
| Methylcyclopentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.2 | 0.0 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.7 | 0.7 | 0.7 |
| 3-Methylhexane | 0.0 | 0.2 | 0.2 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 9.4 | 9.3 | 9.3 |
| 2,3,3-trimethylpentane | 0.0 | 4.8 | 4.4 | 4.5 |

[1]Signal < 2% of spiked control sample signal

**Table 5 Chamber components confirmation: Room Air, Hallway Air and Exposure Day 8**

Sequence #: 002

(% Peak Area)

| Component ID | Room Air | Hallway Air | Group 1 1002M | Group 2 2002M | Group 3 3002M | Group 4 4002M |
|---|---|---|---|---|---|---|
| Isobutane | 0.0 | 0.0 | 0.0 | 8.7 | 8.3 | 8.7 |
| N-Butane | 0.0 | 0.0 | 0.0 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 100[1] | 0.0 | 100[1] | 65.8 | 66.5 | 65.5 |
| N-Pentane | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 0.0 | 0.0 | 2.2 | 2.3 | 2.2 |
| Cyclopentane | 0.0 | 0.0 | 0.0 | 5.1 | 5.2 | 5.1 |
| 2-Methylpentane | 0.0 | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.0 | 0.0 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.0 | 0.0 | 0.6 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 0.0 | 0.0 | 2.0 | 2.2 | 2.2 |
| Methylcyclopentane | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.0 | 0.0 | 0.6 | 0.6 | 0.6 |
| 3-Methylhexane | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 0.0 | 0.0 | 8.8 | 8.5 | 8.8 |
| 2,3,3-trimethylpentane | 0.0 | 0.0 | 0.0 | 4.3 | 4.0 | 4.4 |

[1]Signal < 2% of spiked control sample signal

**Table 6 Chamber components confirmation: Exposure Day 15**

Sequence #: 003

(% Peak Area)

| Component ID | Group 1 1003M | Group 2 2003M | Group 3 3003M | Group 4 4003M |
|---|---|---|---|---|
| Isobutane | 0.0 | 7.5 | 8.4 | 8.5 |
| N-Butane | 0.0 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 100[1] | 66.5 | 65.7 | 65.7 |
| N-Pentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 2.3 | 2.2 | 2.2 |
| Cyclopentane | 0.0 | 5.1 | 5.1 | 5.1 |
| 2-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.6 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 2.0 | 2.3 | 2.2 |
| Methylcyclopentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.6 | 0.6 | 0.6 |
| 3-Methylhexane | 0.0 | 0.1 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 9.0 | 8.7 | 8.8 |
| 2,3,3-trimethylpentane | 0.0 | 4.5 | 4.4 | 4.5 |

[1]Signal < 0.3% of spiked control sample signal

**Table 7 Chamber components confirmation: Exposure Day 22**

Sequence #: 004

(% Peak Area)

| Component ID | Group 1 1004M | Group 2 2004M | Group 3 3004M | Group 4 4004M |
|---|---|---|---|---|
| Isobutane | 12.7 | 3.3 | 7.9 | 7.7 |
| N-Butane | 0.0 | 0.2 | 0.3 | 0.3 |
| 2-Methylbutane | 86.6 | 68.9 | 66.1 | 65.8 |
| N-Pentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 2.4 | 2.3 | 2.3 |
| Cyclopentane | 0.0 | 5.2 | 5.3 | 5.3 |
| 2-Methylpentane | 0.0 | 0.5 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.7 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 2.0 | 2.1 | 2.2 |
| Methylcyclopentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.7 | 0.6 | 0.7 |
| 3-Methylhexane | 0.7 | 0.2 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 9.7 | 8.8 | 9.0 |
| 2,3,3-trimethylpentane | 0.0 | 5.0 | 4.4 | 4.6 |

**Table 8 Chamber components confirmation: Exposure Day 29**

Sequence #: 005

(% Peak Area)

| Component ID | Group 1 1005M | Group 2 2005M | Group 3 3005M | Group 4 4005M |
|---|---|---|---|---|
| Isobutane | 0.0 | 4.0 | 7.8 | 8.6 |
| N-Butane | 0.0 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 100[1] | 75.3 | 66.2 | 65.8 |
| N-Pentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 2.6 | 2.3 | 2.2 |
| Cyclopentane | 0.0 | 5.9 | 5.2 | 5.1 |
| 2-Methylpentane | 0.0 | 0.5 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.6 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 1.7 | 2.0 | 2.1 |
| Methylcyclopentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.1 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.5 | 0.6 | 0.6 |
| 3-Methylhexane | 0.0 | 0.1 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 5.5 | 8.9 | 8.7 |
| 2,3,3-trimethylpentane | 0.0 | 2.1 | 4.3 | 4.3 |

[1]Signal < 0.6% of spiked control sample signal

**Table 9 Chamber components confirmation: Exposure Day 36**

Sequence #: 006

(% Peak Area)

| Component ID | Group 1 1006M | Group 2 2006M | Group 3 3006M | Group 4 4006M |
|---|---|---|---|---|
| Isobutane | 0.0 | 6.7 | 8.0 | 8.0 |
| N-Butane | 0.0 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 100[1] | 67.6 | 65.8 | 66.5 |
| N-Pentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 2.3 | 2.2 | 2.3 |
| Cyclopentane | 0.0 | 5.2 | 5.2 | 5.3 |
| 2-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.6 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 1.9 | 2.3 | 2.3 |
| Methylcyclopentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.6 | 0.6 | 0.6 |
| 3-Methylhexane | 0.0 | 0.1 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 8.8 | 8.9 | 8.6 |
| 2,3,3-trimethylpentane | 0.0 | 4.3 | 4.4 | 4.0 |

[1]Signal < 0.6% of spiked control sample signal

**Table 10 Chamber components confirmation: Exposure Day 43**

Sequence #: 007

(% Peak Area)

| Component ID | Group 1 1007M | Group 2 2007M | Group 3 3007M | Group 4 4007M |
|---|---|---|---|---|
| Isobutane | 0.0 | 7.2 | 8.7 | 8.4 |
| N-Butane | 0.0 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 100[1] | 66.1 | 71.4 | 68.4 |
| N-Pentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 2.3 | 2.3 | 2.3 |
| Cyclopentane | 0.0 | 5.3 | 5.7 | 5.4 |
| 2-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.7 | 0.5 | 0.6 |
| Isobutanol | 0.0 | 2.0 | 2.0 | 2.2 |
| Methylcyclopentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.2 | 0.0 | 0.0 |
| 2,3-Dimethylpentane | 0.0 | 0.7 | 0.4 | 0.6 |
| 3-Methylhexane | 0.0 | 0.1 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 9.2 | 5.3 | 7.4 |
| 2,3,3-trimethylpentane | 0.0 | 4.6 | 2.0 | 3.1 |

[1]Signal < 0.6% of spiked control sample signal

**Table 11 Chamber components confirmation: Exposure Day 50**

Sequence #: 008

(% Peak Area)

| Component ID | Group 1 1008M | Group 2 2008M | Group 3 3008M | Group 4 4008M |
|---|---|---|---|---|
| Isobutane | 0.0 | 6.8 | 8.6 | 9.3 |
| N-Butane | 0.0 | 0.4 | 0.3 | 0.4 |
| 2-Methylbutane | 100[1] | 77.0 | 67.0 | 69.6 |
| N-Pentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 2.4 | 2.2 | 2.2 |
| Cyclopentane | 0.0 | 6.0 | 5.2 | 5.3 |
| 2-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.5 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 1.4 | 1.8 | 1.8 |
| Methylcyclopentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.0 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.3 | 0.6 | 0.5 |
| 3-Methylhexane | 0.0 | 0.1 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 3.0 | 8.2 | 6.4 |
| 2,3,3-trimethylpentane | 0.0 | 1.0 | 3.9 | 2.7 |

[1]Signal < 0.6% of spiked control sample signal

**Table 12 Chamber components confirmation: Exposure Day 57**

Sequence #: 009

(% Peak Area)

| Component ID | Group 1 1009M | Group 2 2009M | Group 3 3009M | Group 4 4009M |
|---|---|---|---|---|
| Isobutane | 12.3[1] | 4.2 | 8.6 | 8.1 |
| N-Butane | 0.0 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 86.1[1] | 70.6 | 67.6 | 66.1 |
| N-Pentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 2.4 | 2.3 | 2.3 |
| Cyclopentane | 0.0 | 5.4 | 5.3 | 5.2 |
| 2-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.7 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 1.7 | 1.9 | 2.2 |
| Methylcyclopentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.6 | 0.6 | 0.6 |
| 3-Methylhexane | 1.6 | 0.1 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 8.5 | 7.8 | 8.8 |
| 2,3,3-trimethylpentane | 0.0 | 4.0 | 3.6 | 4.2 |

[1]Signal < 0.6% of spiked control sample signal

**Table 13 Chamber components confirmation: Exposure Day 64**

Sequence #: 010

(% Peak Area)

| Component ID | Group 1 1010M | Group 2 2010M | Group 3 3010M | Group 4 4010M |
|---|---|---|---|---|
| Isobutane | 0.0 | 2.3 | 8.9 | 8.7 |
| N-Butane | 0.0 | 0.2 | 0.3 | 0.3 |
| 2-Methylbutane | 100[1] | 72.2 | 67.3 | 67.4 |
| N-Pentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 2.4 | 2.2 | 2.2 |
| Cyclopentane | 0.0 | 5.3 | 5.1 | 5.1 |
| 2-Methylpentane | 0.0 | 0.5 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.7 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 1.9 | 1.8 | 2.0 |
| Methylcyclopentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.6 | 0.6 | 0.6 |
| 3-Methylhexane | 0.0 | 0.1 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 8.6 | 7.9 | 7.9 |
| 2,3,3-trimethylpentane | 0.0 | 4.0 | 3.7 | 3.7 |

[1]Signal < 0.6% of spiked control sample signal

**Table 14 Chamber components confirmation: Exposure Day 71**

Sequence #: 011

(% Peak Area)

| Component ID | Group 1 1011M | Group 2 2011M | Group 3 3011M | Group 4 4011M |
|---|---|---|---|---|
| Isobutane | 0.0 | 5.2 | 8.4 | 8.6 |
| N-Butane | 0.0 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 100[1] | 70.9 | 67.1 | 67.0 |
| N-Pentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 2.4 | 2.2 | 2.2 |
| Cyclopentane | 0.0 | 5.5 | 5.2 | 5.2 |
| 2-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.6 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 1.6 | 1.8 | 2.0 |
| Methylcyclopentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.6 | 0.6 | 0.6 |
| 3-Methylhexane | 0.0 | 0.1 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 7.8 | 8.2 | 8.1 |
| 2,3,3-trimethylpentane | 0.0 | 3.6 | 4.0 | 3.9 |

[1]Signal < 3% of spiked control sample signal

## Table 15 Chamber components confirmation: Exposure Day 78

Sequence #: 012

(% Peak Area)

| Component ID | Group 1 1012M | Group 2 2012M | Group 3 3012M | Group 4 4012M |
|---|---|---|---|---|
| Isobutane | 0.0 | 5.9 | 8.6 | 8.0 |
| N-Butane | 0.0 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 92.9[1] | 68.3 | 67.2 | 66.1 |
| N-Pentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 2.3 | 2.2 | 2.3 |
| Cyclopentane | 0.0 | 5.2 | 5.1 | 5.2 |
| 2-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.6 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 1.9 | 1.8 | 2.3 |
| Methylcyclopentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.6 | 0.6 | 0.6 |
| 3-Methylhexane | 7.1[2] | 0.1 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 8.8 | 8.1 | 8.8 |
| 2,3,3-trimethylpentane | 0.0 | 4.5 | 3.8 | 4.3 |

[1]Signal < 0.5% of spiked control sample signal
[2]Not a peak

## Table 16 Chamber components confirmation: Exposure Day 85

Sequence #: 013

(% Peak Area)

| Component ID | Group 1 1013M | Group 2 2013M | Group 3 3013M | Group 4 4013M |
|---|---|---|---|---|
| Isobutane | 11.2[2] | 1.7 | 8.9 | 8.7 |
| N-Butane | 0.0 | 0.2 | 0.3 | 0.3 |
| 2-Methylbutane | 81.7[1] | 70.6 | 66.5 | 66.5 |
| N-Pentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 2.5 | 2.2 | 2.2 |
| Cyclopentane | 6.9[3] | 5.1 | 5.1 | 5.1 |
| 2-Methylpentane | 0.0 | 0.5 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.7 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 1.8 | 1.9 | 2.1 |
| Methylcyclopentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.7 | 0.6 | 0.6 |
| 3-Methylhexane | 0.3[4] | 0.2 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 9.9 | 8.2 | 8.3 |
| 2,3,3-trimethylpentane | 0.0 | 5.1 | 4.2 | 4.0 |

[1]Signal < 1.25% of spiked control sample signal
[2]Signal < 1.91% of spiked control sample signal
[3]Signal < 1.21% of spiked control sample signal
[4]Not a peak

**Table 17 Chamber components confirmation: Exposure Day 92**

Sequence #: 014

(% Peak Area)

| Component ID | Group 1 1014M | Group 2 2014M | Group 3 3014M | Group 4 4014M |
|---|---|---|---|---|
| Isobutane | 0.0 | 5.6 | 8.5 | 9.0 |
| N-Butane | 0.0 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 100[1] | 68.9 | 65.9 | 66.3 |
| N-Pentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 2.3 | 2.2 | 2.2 |
| Cyclopentane | 0.0 | 5.2 | 5.1 | 5.0 |
| 2-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.6 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 1.7 | 2.0 | 2.1 |
| Methylcyclopentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.6 | 0.6 | 0.6 |
| 3-Methylhexane | 0.0 | 0.1 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 8.7 | 8.7 | 8.2 |
| 2,3,3-trimethylpentane | 0.0 | 4.4 | 4.5 | 4.2 |

[1]Signal < 0.13% of spiked control sample signal

**Table 18 Chamber components confirmation: Exposure Day 99**

Sequence #: 015

(% Peak Area)

| Component ID | Group 1 1015M | Group 2 2015M | Group 3 3015M | Group 4 4015M |
|---|---|---|---|---|
| Isobutane | 100[1] | 3.1 | 8.9 | 9.0 |
| N-Butane | 0.0 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 0.0 | 71.3 | 66.6 | 66.2 |
| N-Pentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 2.4 | 2.2 | 2.2 |
| Cyclopentane | 0.0 | 5.4 | 5.1 | 5.1 |
| 2-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.7 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 1.7 | 1.9 | 2.1 |
| Methylcyclopentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.6 | 0.6 | 0.6 |
| 3-Methylhexane | 0.0 | 0.1 | 0.1 | 0.1 |
| 2,2,4-Trimethylpentane | 0.0 | 8.8 | 8.3 | 8.3 |
| 2,3,3-trimethylpentane | 0.0 | 4.2 | 4.0 | 4.0 |

[1]Signal < 0.6% of spiked control sample signal

**Table 19 Chamber components confirmation: Exposure Day 106**

Sequence #: 016

(% Peak Area)

| Component ID | Group 1[(1)] 1016M | Group 2 2016M | Group 3 3016M | Group 4 4016M |
|---|---|---|---|---|
| Isobutane | 0.0 | 5.7 | 9.1 | 9.1 |
| N-Butane | 0.0 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 0.0 | 69.0 | 66.5 | 66.5 |
| N-Pentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 2.3 | 2.2 | 2.2 |
| Cyclopentane | 0.0 | 5.3 | 5.1 | 5.1 |
| 2-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.6 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 1.7 | 1.8 | 2.0 |
| Methylcyclopentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.6 | 0.6 | 0.6 |
| 3-Methylhexane | 0.0 | 0.0 | 0.0 | 0.0 |
| 2,2,4-Trimethylpentane | 0.0 | 8.7 | 8.3 | 8.2 |
| 2,3,3-trimethylpentane | 0.0 | 4.2 | 4.0 | 4.0 |

(1) No peaks detected in sample

**Table 20 Chamber components confirmation: Exposure Day 113**

Sequence #: 017

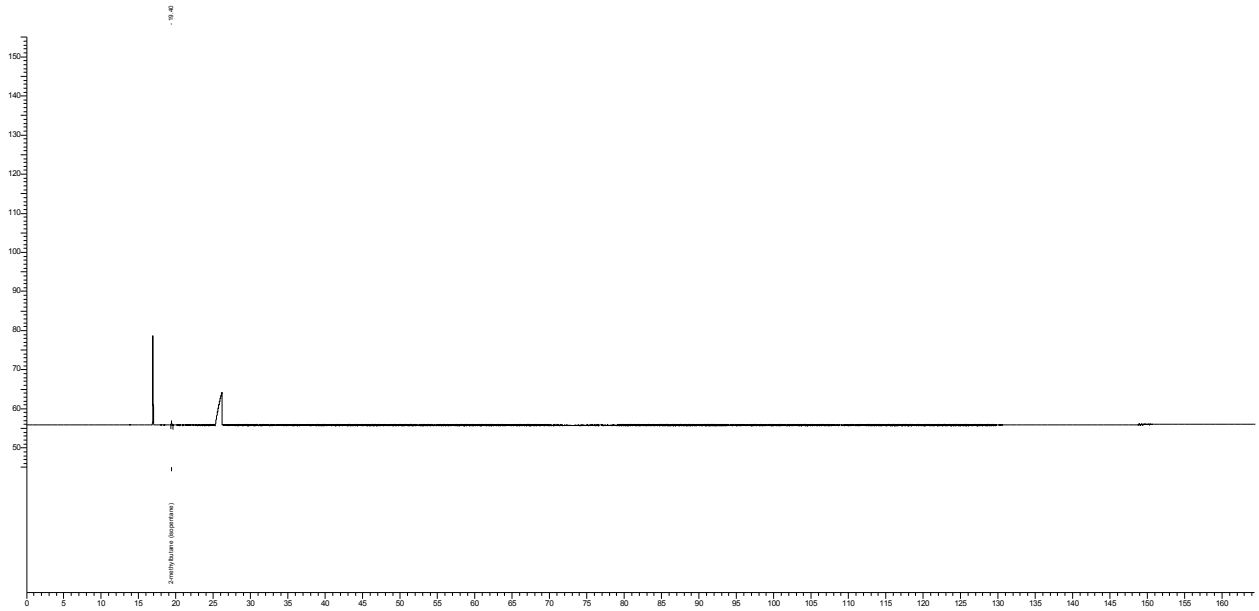
(% Peak Area)

| Component ID | Group 1[(1)] 1017M | Group 2 2017M | Group 3 3017M | Group 4 4017M |
|---|---|---|---|---|
| Isobutane | 0.0 | 3.5 | 8.8 | 8.1 |
| N-Butane | 0.0 | 0.3 | 0.3 | 0.3 |
| 2-Methylbutane | 0.0 | 69.0 | 71.3 | 65.3 |
| N-Pentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2,2-Dimethylbutane | 0.0 | 2.4 | 2.3 | 2.2 |
| Cyclopentane | 0.0 | 5.5 | 5.7 | 5.3 |
| 2-Methylpentane | 0.0 | 0.5 | 0.4 | 0.4 |
| 3-Methylpentane | 0.0 | 0.4 | 0.4 | 0.4 |
| N-Hexane | 0.0 | 0.7 | 0.6 | 0.6 |
| Isobutanol | 0.0 | 1.8 | 1.7 | 2.1 |
| Methylcyclopentane | 0.0 | 0.2 | 0.2 | 0.2 |
| 2-Methylhexane | 0.0 | 0.2 | 0.1 | 0.2 |
| 2,3-Dimethylpentane | 0.0 | 0.7 | 0.5 | 0.7 |
| 3-Methylhexane | 0.0 | 0.2 | 0.1 | 0.2 |
| 2,2,4-Trimethylpentane | 0.0 | 9.7 | 5.2 | 9.1 |
| 2,3,3-trimethylpentane | 0.0 | 4.8 | 2.1 | 4.5 |

[(1)]No peak detected

## Figure 1 Typical GC chromatogram of Group 1 charcoal tube (0 mg/m$^3$)

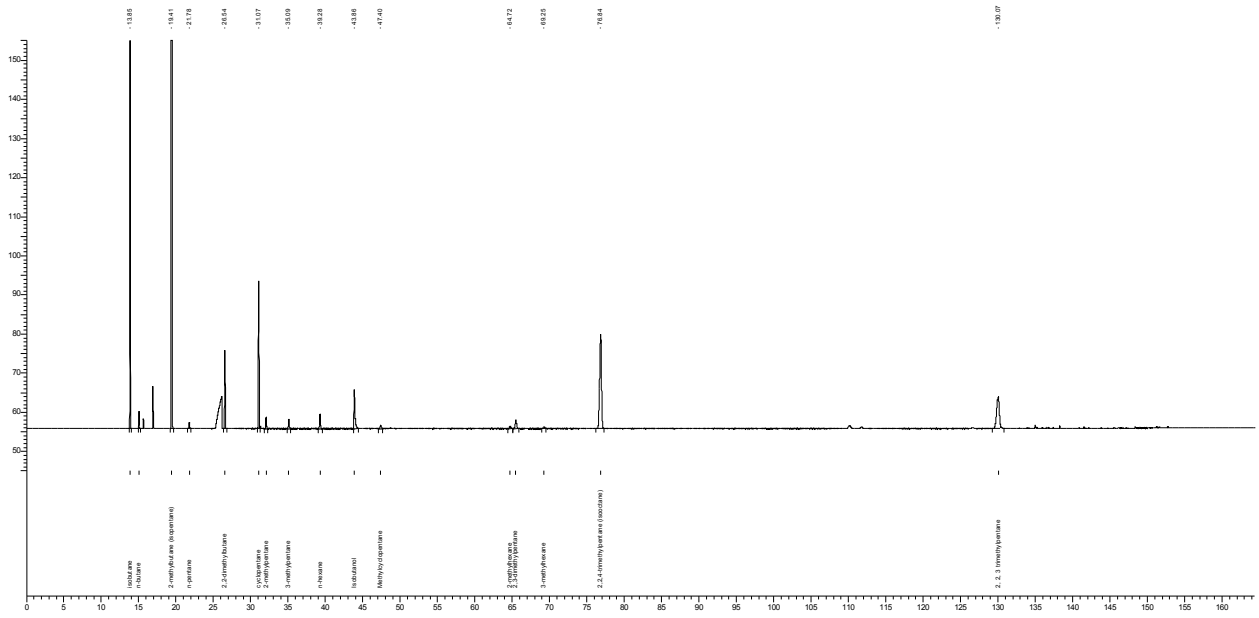
(File Name #: 003_003.rst, 14-4417)



**Response (mV) vs. Time (min.)**

## Figure 2 Typical GC chromatogram of Group 2 charcoal tube (2000 mg/m$^3$)

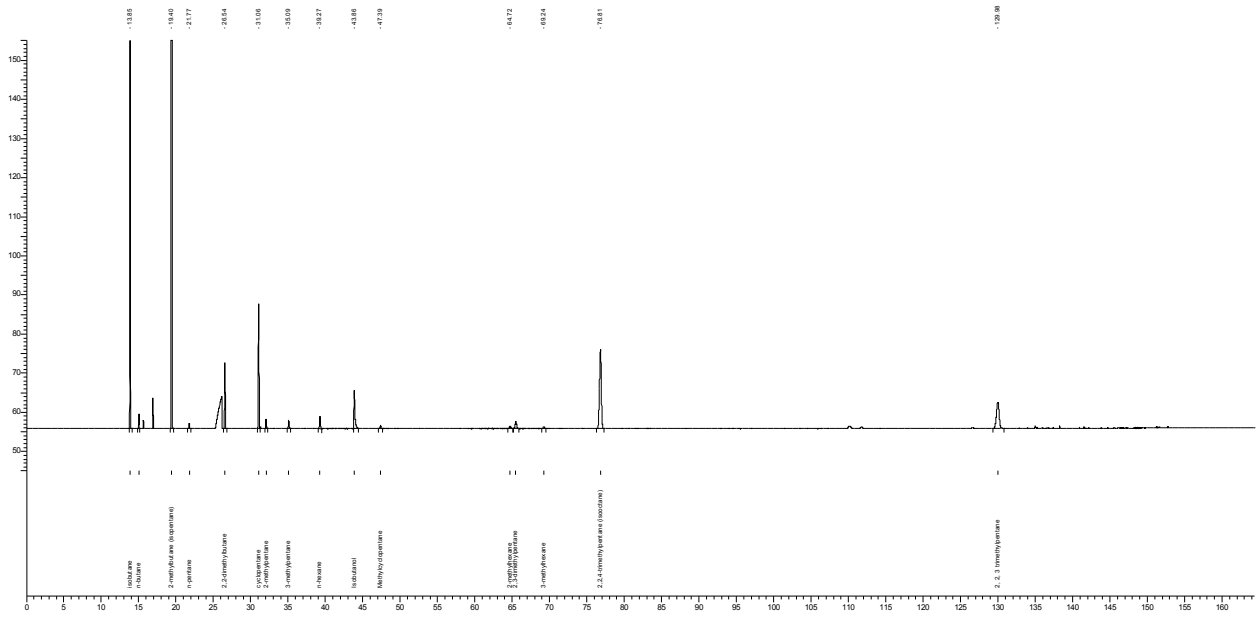
(File Name #: 003_004.rst, 14-4417)



**Response (mV) vs. Time (min.)**

## Figure 3 Typical GC chromatogram of Group 3 charcoal tube (10000 mg/m$^3$)

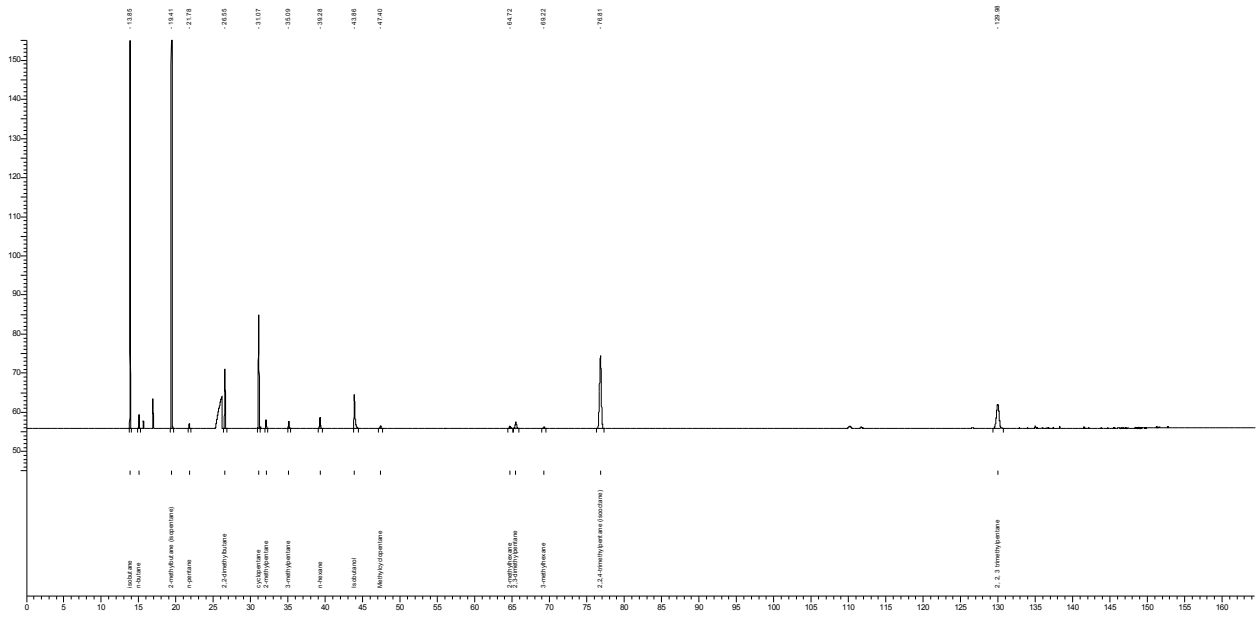
(File Name #: 003_005.rst, 14-4417)



**Response (mV) vs. Time (min.)**

## Figure 4 Typical GC chromatogram of Group 4 charcoal tube (20000 mg/m$^3$)

(File Name #: 003_006.rst, 14-4417)



**Response (mV) vs. Time (min.)**

# Annex 3 Inhalation technology report

# Inhalation Technology Report

On 21 September 2015 the legal entity Huntingdon Life Sciences, Inc. was renamed as Envigo CRS, Inc. No other changes to the legal entity have occurred.

| | |
|---|---|
| **Envigo study number:** | 14-4417 |
| **Version:** | Final |
| **Issue Date:** | 29 March 2016 |

# SIGNATURE PAGE

The following contributing scientist was responsible for this portion of the study:

[redacted]

Justine Damiano, BS
Divisional Manager/Aerosol Technologist
Inhalation Toxicology

29 Mar 16
Date

# 1. Pre-study Atmosphere Characterization

Inhalation exposure system characterized including determinations of:

- Achieved concentration
- Homogeneity of test substance distribution in the chamber

# 2. Test Substance Handling and Processing for Atmosphere Generation

As supplied, Gasoline Isobutanol Vapor Condensate (GIVC) provided in small #33 cylinders and large 100 gallon bulk supply #420 cylinders.

- GIVC metered directly from small Sponsor cylinder as a liquid for daily use
- Small Sponsor cylinders re-filled from large bulk supply cylinders as needed throughout study

# 3. Exposure System

A schematic of the exposure system is presented in Figures 1 and 2. Components of the exposure system included:

- Whole-body exposure chambers:
  - All Groups – 1500 L internal volume
- Animal Restraint:
  - Individually in whole-body restraint cages
- Atmosphere Generation System:
  - Single Sponsor cylinder per each test group (Groups 2 to 4)
  - Test substance vaporized by metering liquid from cylinders to a counter current glass volatilization vessel incorporating a heated glass helix
  - Test substance metering rate monitored continuously using in-line liquid flowmeters
  - Test substance vaporized into a low flow of nitrogen directed from the base of the chamber over the helix
  - Nitrogen gas flow monitored continuously using in-line gas flowmeters
  - Nitrogen purge flow over heating elements employed to minimize corrosion of nichrome heating wire
  - Vaporization temperature monitored continuously and adjusted as needed to maintain temperature in the range 20 to 40°C
  - Test substance vapor and nitrogen flow directed into the inlet of the 1500 L whole-body chamber
  - Test substance liquid flow adjusted as required based on Infrared Absorption Determination of the test substance concentrations
  - Room air and low nitrogen flow only delivered to Group 1 chamber

- Extract Airflow:
    - Drawn by in-house extract system
    - Drawn from base of exposure system
    - Filtered locally through a charcoal bed before discharge
    - Flow – individually calibrated to a minimum target of 300 L/minute:
        - Group 1 – 314 L/minute
        - Group 2 – 319 L/minute
        - Group 3 – 319 L/minute (Days 1 to 2)
        - Group 3 – 317 L/minute (Days 3 to 120)
        - Group 4 – 321 L/minute
- Airflow Monitoring:
    - Nitrogen flowmeters:
        - set to approximately 15 L/min for counter current flow
        - set to approximately 2 L/min purge flow
        - monitored continuously during exposures
        - recorded at approximately 30 minute intervals
    - Magnehelic gauges for chamber airflow and differential exposure system pressure:
        - calibrated before study start
        - monitored continuously during exposures
        - recorded at approximately 30 minute intervals

# 4. Administration

Exposure concentrations achieved by varying test substance flow rate.

Daily Procedure:

- Miran Infra-Red gas spectrophotometer calibration check performed
- Extract airflow runs continuously
- Rats loaded into designated exposure chamber
- Nitrogen and test substance flows initiated
- Sponsor cylinder flows (Groups 2 to 4) established
- Animals exposed for 6 hours
- Exposure system operational parameters monitored continuously
- Chamber temperature, humidity, airflow rate and static pressure documented at approximately 30 minute intervals throughout exposure
- Generation terminated – test substance cylinders and nitrogen switched off
- Animals remained in chambers for minimum $T_{99}$ system clear out period
- Animals returned to home cage at end of exposure

- Animals exposed in the same chamber throughout the study
- Animal position in chamber rotated on a weekly basis

# 5. Atmosphere Analysis

## 5.1 Concentration

The atmosphere concentration was determined as follows:

- Atmosphere analysis - IR spectrophotometer
- Instrument and conditions - Wilks Miran 1A-CVF ambient air analyzer:
  - Wavelength – 9.6 µm (Groups 1 to 4)
  - Pathlength – 2.80 dial setting (Groups 1 to 4)
- Measurement frequency:
  - minimum of 4 samples/group/exposure
  - room air environmental monitoring pretest and at the beginning, middle and end of study
- Sample position remained constant - H1 for chamber concentration (See Figure 1 and 2); exposure room for room air

## 5.2 Test Substance Characterization

The test substance atmosphere was characterized for at least 10 major components as follows:

- Atmosphere analysis – gas chromatography:
  - Refer to Formulation and Inhalation Analysis Department Analytical Report 14-4417 for method details and results
- Sample media – charcoal tube (Supelco Orbo-32 Large)
- Sample flow rate – 0.75 L/min
- Sample duration:
  - 40 minutes (Groups 1 and 2)
  - 8 minutes (Group 3)
  - 4 minutes (Group 4)
- Frequency - minimum of 1 sample/chamber pre-test and per week of exposure
- Sample position remained constant

## 5.3 Particle Size Analysis

Performed to demonstrate the absence of any condensation aerosol as follows:

- Atmosphere analysis – TSI Aerodynamic Particle Sizer
- Qualified pre-study to determine presence or absence of aerosol
- Frequency - minimum of 1 sample/chamber and room environment/week of exposure
- Sample position remained constant

## 5.4 Chamber Temperature and Relative Humidity

Monitored using Extech Humidity and Thermometer gauges as follows:

- Frequency – continuous monitoring; documented every 30 minutes
- Sample location – gauges located inside the exposure chamber
- Sample position remained constant

## 5.5 Static Pressure and Chamber Airflow

Monitored using Dwyer Magnehelic gauges as follows:

- Frequency – continuous monitoring; documented every 30 minutes
- Sample location – gauges located outside the exposure chamber

## 5.6 Chamber Oxygen Levels

Chamber oxygen samples collected as follows:

- Sample media – ServoFlex MiniMP (5200) Gas Analyzer
- Sample frequency – confirmed pretest and at the beginning, middle and end of study
- Sample position remained constant

## 5.7 Exposure Room Environment

- Air sample – collected from exposure room in vapor generation area:
    - Atmosphere analysis - IR spectrophotometer
    - Sample frequency – confirmed pretest and at the beginning, middle and end of study
- Light – collected from exposure room:
    - Instrumentation – Quantum Instruments Photo-Meter 1
    - Maintained at approximately 30 to 40 foot-candles
    - measured at 1.0 meter above floor
    - Sample frequency – confirmed pretest and at the beginning, middle and end of study
- Sound – collected from exposure room:
    - Instrumentation – SPER Scientific Digital Sound Level Meter (840029)
    - Maintained below 85 decibels
    - Sample frequency – confirmed pretest and at the beginning, middle and end of study
- Room environmental monitoring evaluated at both the front and back of the exposure laboratory

## 5.8 Nominal Concentration

Calculated daily for each test substance exposure chamber.

# 6. Data, Abbreviations and Calculations

Data not presented here is retained in the study raw data.

To minimize cumulative errors from repeated rounding of numbers, data in this report has been calculated continuously using unrounded numbers and only rounded for printing. Consequently, presented data may include rounding errors in the last significant figure.

## 6.1 Abbreviations

| | | |
|---|---|---|
| A | = | Airflow |
| C | = | Celsius |
| Conc. | = | Mean atmosphere concentration (mg/m$^3$) |
| D | = | Duration of exposure |
| E | = | Exposure |
| IR | = | Infrared |
| L | = | Liter |
| Min | = | Minute |
| SD | = | Standard Deviation |
| Wt | = | Weight |

## 6.2 Calculations

The IR spectrophotometer was calibrated using test substance directly from the Sponsor cylinder. Absorbance measurements acquired by the IR spectrophotometer were used to calculate analyzed concentration (mg/m$^3$) using a 3$^{rd}$ order fit subjected to least squares regression analysis.

$$\text{Nominal Conc. (mg/m}^3\text{)} = \frac{\text{wt (g)}}{\text{A}\left(\frac{\text{L}}{\text{min}}\right)\text{x D(min)}} \text{ X } \frac{1000\text{ mg}}{1\text{ g}} \text{X} \frac{1000\text{ L}}{1\text{ m3}}$$

# 7. Results and Discussion

Results are presented in Tables 1 to 6 of this report.

## 7.1 Atmosphere Concentration

Overall mean atmosphere and nominal concentrations are presented in Table 1 and summarized below:

| Group | Atmosphere Concentration ($mg/m^3$) | | Nominal Concentration ($mg/m^3$) |
|---|---|---|---|
| | Target | Achieved | Achieved |
| 1 | 0 | 0.296 | - |
| 2 | 2000 | 2089 | 2873 |
| 3 | 10000 | 10240 | 11390 |
| 4 | 20000 | 20410 | 23290 |

Group 1 occasionally showed low concentrations of the test substance (mean concentrations ranged from 0.506 to 7.598 $mg/m^{3)}$ however, for the majority of the study no Gasoline Isobutanol Vapor Condensate was detected.

Mean achieved atmosphere concentrations were 4.5%, 2.4% and 2.1% above target for Groups 2, 3 and 4, respectively.

For Group 2, the mean atmosphere concentration was 27% lower than the mean nominal concentration.

For Group 3, the mean atmosphere concentration was 10% lower than the mean nominal concentration.

For Group 4, the mean atmosphere concentration was 12% lower than the mean nominal concentration.

The differences between the nominal and measured concentrations for Group 2 may be attributed to the limited sensitivity of the balance used to weigh the test substance storage cylinders and the small amount of test substance dispensed during exposure.

These values were considered a reasonable experimental difference as seen previously at this laboratory.

## 7.2 Chamber Temperature and Relative Humidity

Overall mean chamber temperature and relative humidity is presented in Tables 2 and 3 and summarised below:

| Group | Temperature (°C) | Relative Humidity (%) |
|---|---|---|
| 1 | 22 | 55 |
| 2 | 22 | 55 |
| 3 | 22 | 55 |
| 4 | 22 | 51 |

There were occasions throughout the study where the temperature and relative humidity deviated from the target range in the protocol. The daily mean temperature ranged from 17 – 25°C and daily mean relative humidity ranged from 33 –72%. Although there were deviations from the design exposure conditions it was not considered to have been of sufficient magnitude to have impacted the outcome of the study. Overall study means for all groups were consistent for temperature and humidity.

## 7.3 Particle Size

Particle size analysis confirmed the absence of condensation aerosol in all groups during pretest evaluations and throughout the study (Table 4).

## 7.4 Chamber Oxygen

Individual and overall mean chamber oxygen levels are presented in Table 5. Overall on-test mean exposure values are summarised below:

| Group | Oxygen (%) |
|---|---|
| 1 | 19.7 |
| 2 | 19.7 |
| 3 | 19.6 |
| 4 | 19.7 |

Oxygen levels during animal exposure met protocol requirements of 19% or higher.

## 7.5 Room Environment

Individual and overall mean room air values, light and sound monitoring are presented in Table 6. On-test values are summarized below:

Air samples collected from the exposure room (front and back) confirmed the absence of Gasoline Isobutanol Vapor Condensate.

Overall mean light reading for the front room was 36 foot candles with values ranging from 34 to 37 foot candles.

Overall mean light reading for the back room was 36 foot candles with values ranging from 33 to 39 foot candles.

Overall mean noise level for the front room was 62.5 decibels with values ranging from 61.6 to 63.7 decibels.

Overall mean noise level for the back room was 59.6 decibels with values ranging from 58.2 to 61.1 decibels.

All room environmental monitoring was within protocol specifications.

**Figure 1 Schematic of Inhalation Exposure System – Control System**

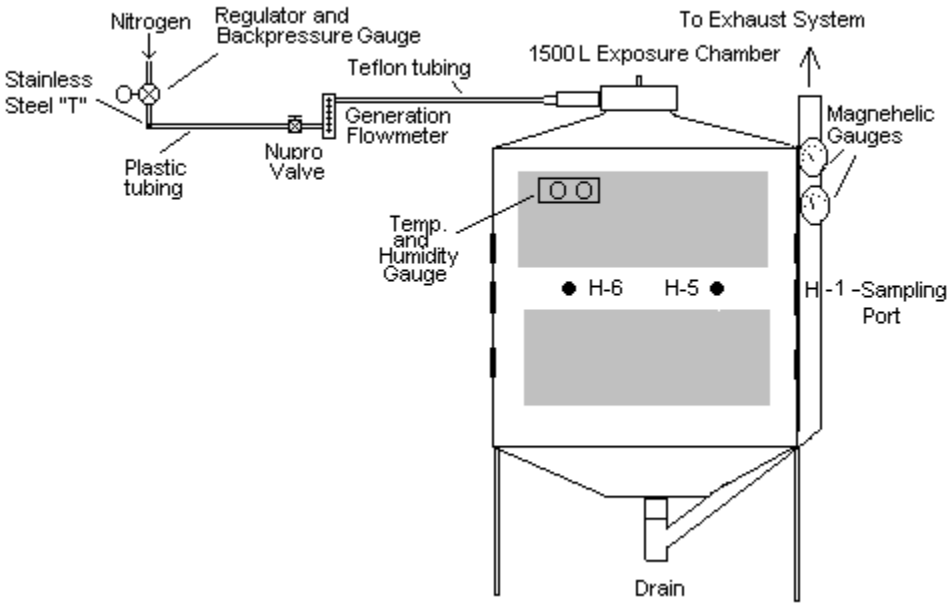


**Figure 2 Schematic of Inhalation Exposure System – Test System**

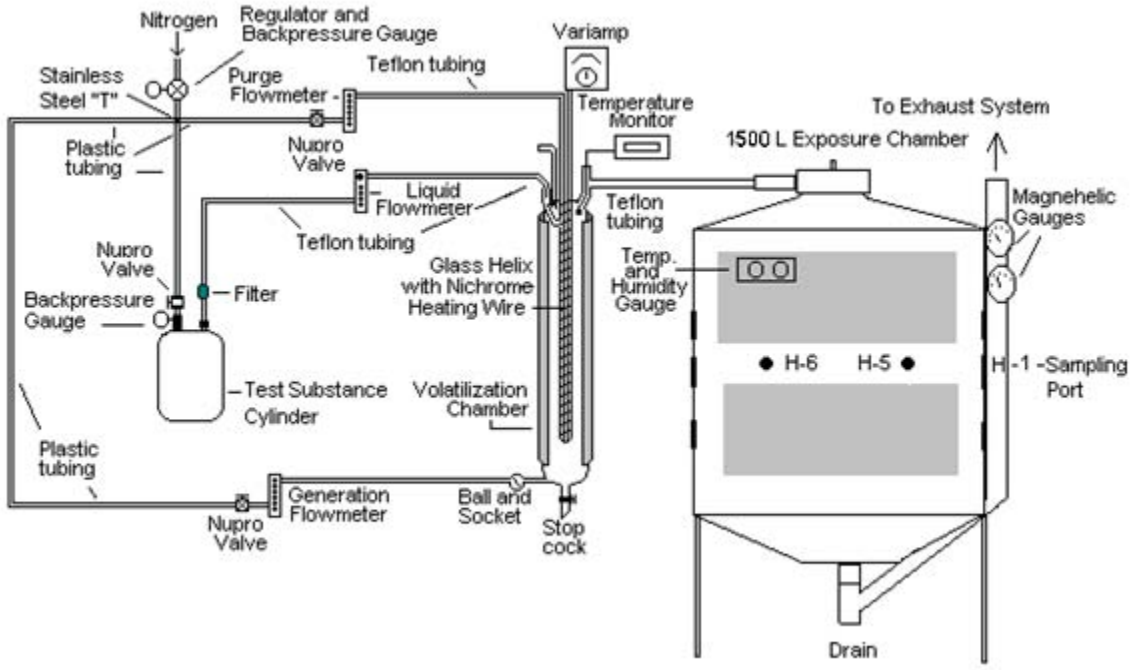


**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) and Nominal Concentration Values**

| Exp Day | Group 1 - Determined Concentration ($mg/m^3$)[a] | | | | | |
|---|---|---|---|---|---|---|
| | Individual Chamber Samples | | | | Mean | Nominal |
| 1 | 0.000 | 4.046 | 6.072 | 6.072 | 4.048 | N/A |
| 2 - 36 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | N/A |
| 37 | 30.39 | 0.000 | 0.000 | 0.000 | 7.598 | N/A |
| 38 | 4.048 | 26.33 | 0.000 | 0.000 | 7.595 | N/A |
| 39 - 41 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | N/A |
| 42 | 0.000 | 0.000 | 0.000 | 2.024 | 0.506 | N/A |
| 43 | 0.000 | 20.25 | 10.12 | 0.000 | 7.593 | N/A |
| 44 - 48 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | N/A |
| 49 | 30.39 | 0.000 | 0.000 | 0.000 | 7.598 | N/A |
| 50 - 118 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | N/A |
| Mean | 0.296 | | | | - | N/A |
| SD | 2.57 | | | | - | N/A |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) and Nominal Concentration Values (Cont.)**

| Exp Day | Group 2 - Determined Concentration ($mg/m^3$)[a] | | | | | |
|---|---|---|---|---|---|---|
| | Individual Chamber Samples | | | | Mean | Nominal |
| 1 | 3242 | 2864 | 2762 | 2156 | 2756 | 3483 |
| 2 | 2593 | 1643 | 2140 | 2227 | 2151 | 3483 |
| 3 | 1796 | 1762 | 2531 | 2025 | 2029 | 3483 |
| 4 | 2091 | 2265 | 2168 | 1965 | 2122 | 1742 |
| 5 | 1778 | 2025 | 1796 | 2142 | 1935 | 3483 |
| 6 | 1769 | 1682 | 1618 | 2390 | 1865 | 1742 |
| 7 | 1872 | 1942 | 2381 | 2267 | 2116 | 3483 |
| 8 | 1683 | 1933 | 2175 | 2016 | 1952 | 3483 |
| 9 | 1889 | 2397 | 1984 | 1796 | 2017 | 1742 |
| 10 | 2260 | 2421 | 2454 | 2397 | 2383 | 3483 |
| 11 | 2388 | 1721 | 1896 | 2697 | 2176 | 1742 |
| 12 | 2293 | 2225 | 2171 | 2077 | 2192 | 3483 |
| 13 | 2114 | 1776 | 2005 | 1801 | 1924 | 3483 |
| 14 | 2065 | 2089 | 2251 | 2269 | 2169 | 3483 |
| 15 | 2114 | 2210 | 2147 | 2037 | 2127 | 1742 |
| 16 | 2140 | 2241 | 2173 | 2236 | 2198 | 3483 |
| 17 | 2196 | 2210 | 2276 | 2175 | 2214 | 3483 |
| 18 | 2246 | 2225 | 2206 | 2121 | 2200 | 3483 |
| 19 | 2074 | 2019 | 1974 | 2390 | 2114 | 3483 |
| 20 | 1960 | 2046 | 2476 | 2196 | 2170 | 1742 |
| 21 | 2579 | 2416 | 2312 | 2369 | 2419 | 1742 |
| 22 | 2051 | 2293 | 1946 | 2067 | 2089 | 2734 |
| 23 | 2007 | 2005 | 1923 | 1785 | 1930 | 2595 |
| 24 | 1849 | 2215 | 2291 | 2086 | 2110 | 2682 |
| 25 | 1889 | 2189 | 2253 | 2159 | 2123 | 2734 |
| 26 | 1769 | 2016 | 1958 | 2274 | 2004 | 2786 |
| 27 | 1845 | 1979 | 2381 | 2039 | 2061 | 2682 |
| 28 | 2081 | 2117 | 2114 | 2357 | 2167 | 2769 |
| 29 | 1757 | 2241 | 2103 | 2117 | 2055 | 2717 |
| 30 | 2159 | 2074 | 2140 | 2128 | 2125 | 2752 |
| 31 | 2347 | 2208 | 2248 | 2178 | 2245 | 2734 |
| 32 | 2321 | 2014 | 2236 | 2142 | 2178 | 2647 |
| 33 | 2081 | 2121 | 1689 | 1666 | 1889 | 2438 |
| 34 | 1748 | 2203 | 1750 | 1916 | 1904 | 2438 |
| 35 | 1530 | 1865 | 2005 | 1801 | 1800 | 2543 |
| 36 | 1473 | 1410 | 1705 | 1769 | 1589 | 2692 |
| 37 | 1995 | 1810 | 2187 | 3156 | 2287 | 2908 |
| 38 | 2407 | 1923 | 2310 | 2298 | 2235 | 3030 |

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) and Nominal Concentration Values (Cont.)**

| Exp Day | Group 2 - Determined Concentration (mg/m$^3$)[a] | | | | | |
|---|---|---|---|---|---|---|
| | Individual Chamber Samples | | | | Mean | Nominal |
| 39 | 2110 | 2079 | 2112 | 2154 | 2114 | 2926 |
| 40 | 1659 | 1629 | 1643 | 1757 | 1672 | 2421 |
| 41 | 1796 | 1965 | 2070 | 1757 | 1897 | 2473 |
| 42 | 1942 | 2131 | 2030 | 1977 | 2020 | 2699 |
| 43 | 2135 | 1859 | 1946 | 1884 | 1956 | 2508 |
| 44 | 2021 | 1842 | 1993 | 1889 | 1936 | 2560 |
| 45 | 2025 | 1919 | 2258 | 2312 | 2129 | 2717 |
| 46 | 2128 | 1965 | 1654 | 1960 | 1927 | 2874 |
| 47 | 2000 | 2046 | 1875 | 2016 | 1984 | 2699 |
| 48 | 2091 | 1928 | 2000 | 1979 | 2000 | 2769 |
| 49 | 2081 | 2070 | 1902 | 2019 | 2018 | 2908 |
| 50 | 2110 | 2081 | 2060 | 2039 | 2073 | 2769 |
| 51 | 2072 | 2019 | 1810 | 2046 | 1987 | 2856 |
| 52 | 2016 | 2103 | 2051 | 2350 | 2130 | 2926 |
| 53 | 1773 | 1958 | 1944 | 1882 | 1889 | 2665 |
| 54 | 1662 | 1836 | 1953 | 1909 | 1840 | 2665 |
| 55 | 1712 | 2388 | 2051 | 1974 | 2031 | 2839 |
| 56 | 1712 | 2253 | 2051 | 1995 | 2003 | 3396 |
| 57 | 2100 | 2070 | 1789 | 1928 | 1972 | 2786 |
| 58 | 1902 | 2117 | 1960 | 1865 | 1961 | 2821 |
| 59 | 1882 | 1921 | 1960 | 2086 | 1962 | 2978 |
| 60 | 1974 | 2070 | 1898 | 1808 | 1938 | 2786 |
| 61 | 1801 | 2407 | 2210 | 2414 | 2208 | 3100 |
| 62 | 2338 | 2255 | 2215 | 2152 | 2240 | 3170 |
| 63 | 2596 | 2291 | 2147 | 1958 | 2248 | 3239 |
| 64 | 1909 | 2077 | 1849 | 2119 | 1889 | 3292 |
| 65 | 1892 | 2175 | 2081 | 1905 | 2013 | 3083 |
| 66 | 1988 | 2044 | 2051 | 2110 | 2048 | 3204 |
| 67 | 2021 | 2173 | 2138 | 2178 | 2128 | 3117 |
| 68 | 2196 | 2192 | 2622 | 2114 | 2281 | 3239 |
| 69 | 1773 | 2225 | 2369 | 2138 | 2126 | 3100 |
| 70 | 2016 | 2159 | 2159 | 1956 | 2073 | 2995 |
| 71 | 2149 | 2312 | 2098 | 2063 | 2156 | 3152 |
| 72 | 1937 | 2159 | 2100 | 2072 | 2067 | 3204 |
| 73 | 2019 | 2002 | 2149 | 2098 | 2067 | 3170 |
| 74 | 2014 | 2131 | 1845 | 1815 | 1951 | 2961 |
| 75 | 2225 | 2295 | 2243 | 2222 | 2246 | 3083 |
| 76 | 1930 | 2243 | 2156 | 2246 | 2144 | 3117 |

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) and Nominal Concentration Values (Cont.)**

| Exp Day | Group 2 - Determined Concentration (mg/m$^3$)[a] | | | | | |
|---|---|---|---|---|---|---|
| | Individual Chamber Samples | | | | Mean | Nominal |
| 77 | 1849 | 2072 | 1942 | 2258 | 2030 | 3117 |
| 78 | 1900 | 2469 | 2156 | 2084 | 2152 | 3030 |
| 79 | 2269 | 1819 | 1981 | 2194 | 2066 | 2734 |
| 80 | 2037 | 2002 | 2185 | 2388 | 2153 | 2995 |
| 81 | 2364 | 2128 | 2357 | 2350 | 2300 | 3117 |
| 82 | 2314 | 2218 | 2156 | 2100 | 2197 | 3013 |
| 83 | 2350 | 1930 | 1986 | 2302 | 2142 | 2821 |
| 84 | 2269 | 2051 | 2093 | 2149 | 2140 | 2821 |
| 85 | 2131 | 1930 | 2393 | 2234 | 2172 | 3083 |
| 86 | 2178 | 1991 | 2192 | 2194 | 2139 | 2821 |
| 87 | 2035 | 2376 | 2201 | 2376 | 2247 | 2961 |
| 88 | 2149 | 2185 | 2189 | 2028 | 2138 | 2891 |
| 89 | 2251 | 1949 | 1965 | 1879 | 2011 | 2665 |
| 90 | 2215 | 1981 | 1778 | 2400 | 2094 | 2612 |
| 91 | 2355 | 2019 | 1977 | 2138 | 2122 | 2752 |
| 92 | 1527 | 2620 | 1783 | 2390 | 2080 | 2821 |
| 93 | 1801 | 2065 | 2105 | 2028 | 2000 | 2839 |
| 94 | 2070 | 2258 | 2131 | 1944 | 2101 | 2839 |
| 95 | 2180 | 2201 | 2206 | 2178 | 2191 | 2978 |
| 96 | 2163 | 2180 | 2070 | 2051 | 2116 | 2700 |
| 97 | 2126 | 1847 | 2100 | 2028 | 2025 | 2908 |
| 98 | 2147 | 2175 | 2035 | 1981 | 2085 | 2821 |
| 99 | 2077 | 2286 | 2426 | 2265 | 2264 | 3083 |
| 100 | 2051 | 2182 | 2262 | 2324 | 2205 | 2961 |
| 101 | 2255 | 2236 | 2220 | 2267 | 2245 | 2908 |
| 102 | 1900 | 2258 | 2210 | 2182 | 2138 | 2978 |
| 103 | 1900 | 2189 | 2005 | 1882 | 1994 | 2682 |
| 104 | 2039 | 1819 | 2395 | 2196 | 2112 | 3065 |
| 105 | 1960 | 1923 | 2236 | 2189 | 2077 | 2839 |
| 106 | 1773 | 2114 | 1981 | 2152 | 2005 | 2769 |
| 107 | 2128 | 1767 | 1882 | 2276 | 2013 | 2821 |
| 108 | 2058 | 2159 | 2171 | 2149 | 2134 | 2752 |
| 109 | 2196 | 1893 | 2070 | 1977 | 2034 | 3030 |
| 110 | 1812 | 1979 | 1974 | 1963 | 1932 | 2734 |
| 111 | 2400 | 1889 | 1870 | 2374 | 2133 | 2908 |
| 112 | 2210 | 2234 | 2091 | 2178 | 2178 | 2665 |
| 113 | 1819 | 2035 | 2124 | 2274 | 2063 | 2926 |
| 114 | 1780 | 2232 | 2239 | 2161 | 2103 | 2874 |

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) and Nominal Concentration Values (Cont.)**

| Exp Day | Group 2 - Determined Concentration (mg/m$^3$)[a] | | | | | |
|---|---|---|---|---|---|---|
| | Individual Chamber Samples | | | | Mean | Nominal |
| 115 | 2307 | 2229 | 2154 | 2145 | 2209 | 3083 |
| 116 | 1916 | 2279 | 2243 | 2077 | 2129 | 2926 |
| 117 | 2272 | 2119 | 2107 | 2161 | 2165 | 2804 |
| 118 | 2248 | 2112 | 2147 | 2060 | 2142 | 2804 |
| 119 | 2156 | 2206 | 2378 | 2105 | 2211 | 2891 |
| Mean | | | 2089 | | - | 2873 |
| SD | | | 215 | | - | 392 |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) and Nominal Concentration Values (Cont.)**

| Exp Day | Group 3 - Determined Concentration (mg/m$^3$)[a] | | | | | |
|---|---|---|---|---|---|---|
| | Individual Chamber Samples | | | | Mean | Nominal |
| 1 | 8810 | 10090 | 10360 | 9846 | 9777 | 10450 |
| 2 | 8227 | 7852 | 7996 | 9045 | 8280 | 10450 |
| 3 | 9786 | 10780 | 10360 | 10360 | 10320 | 12270 |
| 4 | 10630 | 9726 | 8372 | 9281 | 9502 | 10520 |
| 5 | 10180 | 9875 | 10270 | 10180 | 10130 | 12270 |
| 6 | 14560 | 11420 | 9607 | 9548 | 11280 | 10520 |
| 7 | 10240 | 10240 | 10150 | 10030 | 10170 | 10520 |
| 8 | 10600 | 10870 | 10120 | 9340 | 10230 | 10520 |
| 9 | 10210 | 10300 | 10480 | 10240 | 10310 | 12270 |
| 10 | 9399 | 9786 | 9607 | 10360 | 9788 | 10520 |
| 11 | 8285 | 12090 | 11420 | 9163 | 10240 | 10520 |
| 12 | 9310 | 8663 | 11970 | 11880 | 10460 | 10520 |
| 13 | 10600 | 10660 | 10360 | 10780 | 10600 | 10520 |
| 14 | 10810 | 11080 | 10960 | 11080 | 10980 | 12270 |
| 15 | 11390 | 10960 | 10930 | 11080 | 11090 | 12270 |
| 16 | 10120 | 11570 | 9786 | 10150 | 10410 | 10520 |
| 17 | 10180 | 10630 | 11020 | 10810 | 10660 | 10520 |
| 18 | 10480 | 10570 | 10420 | 9667 | 10280 | 12270 |
| 19 | 10570 | 10270 | 10990 | 10600 | 10610 | 12270 |
| 20 | 10660 | 10660 | 10450 | 10390 | 10540 | 12270 |
| 21 | 7737 | 10960 | 11200 | 11020 | 10230 | 14020 |
| 22 | 10780 | 9905 | 10540 | 9340 | 10140 | 11570 |
| 23 | 10690 | 10180 | 11230 | 10810 | 10730 | 11110 |
| 24 | 10150 | 10630 | 10390 | 10300 | 10370 | 11150 |
| 25 | 10570 | 9281 | 10630 | 10060 | 10140 | 10870 |
| 26 | 10810 | 10450 | 10270 | 10480 | 10500 | 11530 |
| 27 | 11390 | 10960 | 10900 | 10750 | 11000 | 11950 |
| 28 | 10480 | 10360 | 10390 | 10330 | 10390 | 11620 |
| 29 | 11110 | 11140 | 11050 | 11110 | 11100 | 11990 |
| 30 | 10660 | 10810 | 10300 | 8839 | 10150 | 10830 |
| 31 | 9459 | 10600 | 10540 | 10180 | 10190 | 11340 |
| 32 | 10090 | 11020 | 10750 | 9548 | 10350 | 11320 |
| 33 | 10180 | 11110 | 10660 | 10600 | 10640 | 11290 |
| 34 | 9905 | 10990 | 10780 | 10840 | 10630 | 11620 |
| 35 | 10150 | 10120 | 10480 | 10660 | 10350 | 11230 |
| 36 | 10180 | 10930 | 10630 | 10480 | 10560 | 11780 |
| 37 | 11540 | 11230 | 11230 | 11140 | 11290 | 12150 |
| 38 | 10420 | 10630 | 10480 | 10660 | 10550 | 11480 |

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) and Nominal Concentration Values (Cont.)**

| Exp Day | Group 3 - Determined Concentration ($mg/m^3$)[a] | | | | | |
|---|---|---|---|---|---|---|
| | Individual Chamber Samples | | | | Mean | Nominal |
| 39 | 10300 | 10180 | 10180 | 10210 | 10220 | 11270 |
| 40 | 10180 | 10060 | 9607 | 9786 | 9908 | 10620 |
| 41 | 8722 | 10210 | 10270 | 9905 | 9777 | 10690 |
| 42 | 10120 | 11360 | 9846 | 10780 | 10530 | 11180 |
| 43 | 10630 | 10750 | 10600 | 10810 | 10700 | 11460 |
| 44 | 10300 | 9816 | 10780 | 10480 | 10340 | 11160 |
| 45 | 10660 | 10930 | 10750 | 10540 | 10720 | 11250 |
| 46 | 10390 | 11510 | 10660 | 10480 | 10760 | 11650 |
| 47 | 10300 | 11270 | 11200 | 11270 | 11010 | 11580 |
| 48 | 11080 | 11110 | 10750 | 11270 | 11050 | 11600 |
| 49 | 8810 | 9251 | 9696 | 10480 | 9559 | 11430 |
| 50 | 9192 | 10060 | 10360 | 10210 | 9956 | 11650 |
| 51 | 10060 | 9875 | 9935 | 9846 | 9929 | 11670 |
| 52 | 9846 | 10150 | 10060 | 10060 | 10030 | 11790 |
| 53 | 9875 | 10360 | 9935 | 10450 | 10160 | 11810 |
| 54 | 10510 | 10450 | 10450 | 10360 | 10440 | 11760 |
| 55 | 10660 | 10030 | 10420 | 8634 | 9936 | 11340 |
| 56 | 10660 | 10930 | 10420 | 10210 | 10560 | 11390 |
| 57 | 10120 | 10060 | 9192 | 9995 | 9842 | 10880 |
| 58 | 10180 | 10330 | 9696 | 9577 | 9946 | 10810 |
| 59 | 9340 | 11660 | 11200 | 11170 | 10840 | 11600 |
| 60 | 10210 | 10690 | 10810 | 10930 | 10660 | 11390 |
| 61 | 10750 | 10690 | 10840 | 10690 | 10740 | 11090 |
| 62 | 9846 | 10390 | 10210 | 9965 | 10100 | 10780 |
| 63 | 10720 | 10420 | 10420 | 10480 | 10510 | 11060 |
| 64 | 9459 | 9756 | 9875 | 10120 | 9803 | 11650 |
| 65 | 10180 | 10180 | 10240 | 10600 | 10300 | 11920 |
| 66 | 9637 | 10210 | 10330 | 10180 | 10090 | 11760 |
| 67 | 10420 | 10510 | 10450 | 10450 | 10460 | 12020 |
| 68 | 11630 | 9667 | 11140 | 9995 | 10610 | 11180 |
| 69 | 8025 | 8810 | 10030 | 10150 | 9254 | 11390 |
| 70 | 9667 | 10060 | 9905 | 9577 | 9802 | 11460 |
| 71 | 9667 | 10060 | 9995 | 10120 | 9961 | 11500 |
| 72 | 8927 | 10210 | 9637 | 10270 | 9761 | 11370 |
| 73 | 9816 | 10360 | 10270 | 10240 | 10170 | 11760 |
| 74 | 9399 | 8839 | 10240 | 9905 | 9596 | 11440 |
| 75 | 9370 | 9995 | 9995 | 10090 | 9863 | 11620 |
| 76 | 10150 | 10180 | 10180 | 10180 | 10170 | 11720 |

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) and Nominal Concentration Values (Cont.)**

| Exp Day | Group 3 - Determined Concentration ($mg/m^3$)[a] | | | | | |
|---|---|---|---|---|---|---|
| | Individual Chamber Samples | | | | Mean | Nominal |
| 77 | 9488 | 9786 | 9816 | 9905 | 9749 | 11460 |
| 78 | 9846 | 9607 | 9370 | 9370 | 9548 | 11340 |
| 79 | 9965 | 9995 | 10330 | 10360 | 10160 | 11600 |
| 80 | 11630 | 10210 | 10240 | 10150 | 10560 | 11760 |
| 81 | 10270 | 10450 | 9875 | 10060 | 10160 | 10760 |
| 82 | 8927 | 10240 | 10120 | 10570 | 9964 | 10810 |
| 83 | 10330 | 9518 | 9875 | 9548 | 9818 | 10390 |
| 84 | 8927 | 10960 | 10870 | 10870 | 10410 | 11460 |
| 85 | 11050 | 10780 | 10780 | 10660 | 10820 | 12020 |
| 86 | 10480 | 10750 | 10600 | 10630 | 10620 | 11430 |
| 87 | 10510 | 10420 | 10270 | 10810 | 10500 | 11290 |
| 88 | 9696 | 10840 | 10360 | 11230 | 10530 | 11340 |
| 89 | 10600 | 10360 | 10270 | 10330 | 10390 | 11250 |
| 90 | 11270 | 10300 | 10300 | 10060 | 10480 | 10950 |
| 91 | 10870 | 10150 | 11020 | 11140 | 10800 | 11160 |
| 92 | 10960 | 10660 | 10540 | 10150 | 10580 | 11290 |
| 93 | 9251 | 10510 | 9459 | 9816 | 9759 | 10940 |
| 94 | 10450 | 10390 | 10450 | 10420 | 10430 | 11650 |
| 95 | 10300 | 10060 | 9905 | 9846 | 10030 | 11580 |
| 96 | 9399 | 9637 | 9756 | 9905 | 9674 | 11340 |
| 97 | 9429 | 8957 | 9340 | 9429 | 9289 | 10920 |
| 98 | 10090 | 10240 | 9905 | 9935 | 10040 | 11360 |
| 99 | 10450 | 10450 | 10960 | 10810 | 10670 | 11530 |
| 100 | 10060 | 9756 | 10030 | 9816 | 9916 | 11290 |
| 101 | 10060 | 10360 | 10450 | 10300 | 10290 | 11510 |
| 102 | 10210 | 10180 | 10450 | 10330 | 10290 | 11650 |
| 103 | 9667 | 9965 | 9163 | 8868 | 9416 | 11230 |
| 104 | 9548 | 10210 | 10090 | 10060 | 9977 | 11320 |
| 105 | 10540 | 10570 | 10660 | 10330 | 10530 | 11460 |
| 106 | 10360 | 10240 | 10120 | 9846 | 10140 | 11180 |
| 107 | 9577 | 10390 | 8722 | 9607 | 9574 | 11300 |
| 108 | 10180 | 10270 | 10510 | 10360 | 10330 | 11900 |
| 109 | 10450 | 10330 | 10330 | 10480 | 10400 | 11690 |
| 110 | 9607 | 9816 | 10450 | 9756 | 9907 | 11150 |
| 111 | 10510 | 9163 | 10750 | 10210 | 10160 | 11370 |
| 112 | 9104 | 10330 | 9548 | 9905 | 9722 | 11530 |
| 113 | 9995 | 10390 | 9548 | 10450 | 10100 | 11720 |
| 114 | 9965 | 10060 | 10030 | 9965 | 10010 | 11360 |

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) and Nominal Concentration Values (Cont.)**

| Exp Day | Group 3 - Determined Concentration (mg/m$^3$)[a] | | | | | |
|---|---|---|---|---|---|---|
| | Individual Chamber Samples | | | | Mean | Nominal |
| 115 | 8927 | 10330 | 10690 | 10840 | 10200 | 11690 |
| 116 | 9696 | 10240 | 9399 | 10870 | 10050 | 11370 |
| 117 | 10600 | 10120 | 10180 | 9548 | 10110 | 10870 |
| 118 | 9816 | 9756 | 9846 | 9935 | 9838 | 11180 |
| 119 | 9816 | 10360 | 10570 | 10630 | 10340 | 11650 |
| 120 | 10270 | 9935 | 9756 | 10150 | 10030 | 11290 |
| Mean | | | 10240 | | - | 11390 |
| SD | | | 660 | | - | 531 |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) and Nominal Concentration Values (Cont.)**

| Exp Day | Group 4 - Determined Concentration (mg/m$^3$)[a] | | | | | |
|---|---|---|---|---|---|---|
| | Individual Chamber Samples | | | | Mean | Nominal |
| 1 | 19450 | 20600 | 19900 | 20250 | 20050 | 22500 |
| 2 | 19170 | 19770 | 18430 | 18780 | 19040 | 22500 |
| 3 | 18500 | 20510 | 20790 | 20570 | 20090 | 24230 |
| 4 | 19290 | 18430 | 15890 | 19610 | 18310 | 22500 |
| 5 | 19200 | 18560 | 20660 | 20220 | 19660 | 24230 |
| 6 | 19490 | 19390 | 18020 | 23410 | 20080 | 22500 |
| 7 | 19710 | 19770 | 19520 | 19040 | 19510 | 24230 |
| 8 | 18270 | 18310 | 20190 | 20030 | 19200 | 22500 |
| 9 | 19610 | 19140 | 21390 | 20630 | 20190 | 24230 |
| 10 | 19490 | 20980 | 21200 | 21710 | 20850 | 22500 |
| 11 | 20540 | 19960 | 22850 | 21200 | 21140 | 22500 |
| 12 | 21840 | 21140 | 20980 | 20470 | 21110 | 22500 |
| 13 | 21960 | 20540 | 19010 | 21520 | 20760 | 22500 |
| 14 | 19960 | 19010 | 19230 | 21010 | 19800 | 22500 |
| 15 | 18820 | 19420 | 21200 | 20280 | 19930 | 22500 |
| 16 | 17440 | 19490 | 22970 | 21050 | 20240 | 22500 |
| 17 | 20920 | 21550 | 21170 | 20510 | 21040 | 24230 |
| 18 | 20700 | 21110 | 20540 | 19930 | 20570 | 25960 |
| 19 | 20410 | 20350 | 21080 | 22280 | 21030 | 24230 |
| 20 | 20730 | 22090 | 21050 | 20980 | 21210 | 22500 |
| 21 | 20820 | 21170 | 20760 | 20820 | 20890 | 24230 |
| 22 | 21390 | 20850 | 20760 | 21080 | 21020 | 23830 |
| 23 | 21200 | 21080 | 20890 | 20700 | 20970 | 23730 |
| 24 | 21460 | 20980 | 20660 | 20660 | 20940 | 23970 |
| 25 | 20660 | 20160 | 22280 | 21520 | 21160 | 24350 |
| 26 | 19650 | 20570 | 20190 | 20410 | 20210 | 23800 |
| 27 | 19450 | 21050 | 20440 | 19200 | 20040 | 23760 |
| 28 | 19800 | 19900 | 20090 | 20190 | 20000 | 23520 |
| 29 | 20120 | 20000 | 19900 | 19770 | 19950 | 23300 |
| 30 | 18080 | 20060 | 20380 | 19840 | 19590 | 22340 |
| 31 | 20440 | 20600 | 21270 | 21050 | 20840 | 24060 |
| 32 | 21080 | 20600 | 21360 | 21200 | 21060 | 24160 |
| 33 | 20950 | 20700 | 22150 | 21050 | 21210 | 24130 |
| 34 | 18020 | 18020 | 21460 | 18940 | 19110 | 23230 |
| 35 | 21050 | 21010 | 20470 | 20470 | 20750 | 24110 |
| 36 | 20060 | 21330 | 21240 | 21550 | 21050 | 23940 |
| 37 | 19200 | 20470 | 19960 | 20920 | 20140 | 23210 |
| 38 | 19010 | 18980 | 20510 | 18110 | 19150 | 22450 |

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) and Nominal Concentration Values (Cont.)**

| Exp Day | Group 4 - Determined Concentration (mg/m$^3$)[a] | | | | | |
|---|---|---|---|---|---|---|
| | Individual Chamber Samples | | | | Mean | Nominal |
| 39 | 19230 | 20410 | 20160 | 19230 | 19760 | 23800 |
| 40 | 16900 | 18820 | 19770 | 20950 | 19110 | 22810 |
| 41 | 20600 | 19840 | 19390 | 19140 | 19740 | 22740 |
| 42 | 20660 | 18820 | 21840 | 21170 | 20620 | 23160 |
| 43 | 19770 | 20350 | 20060 | 19710 | 19970 | 23310 |
| 44 | 19650 | 20980 | 20310 | 21490 | 20610 | 23800 |
| 45 | 19420 | 19200 | 19550 | 19450 | 19410 | 23120 |
| 46 | 20000 | 20630 | 19930 | 19710 | 20070 | 23540 |
| 47 | 20820 | 21140 | 20440 | 20090 | 20620 | 23870 |
| 48 | 18590 | 21300 | 19870 | 20950 | 20180 | 23100 |
| 49 | 20790 | 20410 | 22630 | 21620 | 21360 | 23400 |
| 50 | 19450 | 17130 | 20630 | 19070 | 19070 | 23970 |
| 51 | 20220 | 20250 | 19870 | 19710 | 20010 | 24700 |
| 52 | 19770 | 19930 | 19140 | 19740 | 19650 | 23950 |
| 53 | 20030 | 20280 | 20250 | 19960 | 20130 | 24330 |
| 54 | 19070 | 20250 | 19960 | 19870 | 19790 | 26450 |
| 55 | 21270 | 22940 | 22940 | 21050 | 22050 | 23680 |
| 56 | 21650 | 22410 | 22370 | 21930 | 22090 | 24200 |
| 57 | 21490 | 21650 | 20980 | 20470 | 21150 | 23550 |
| 58 | 19770 | 21140 | 20600 | 20570 | 20520 | 22650 |
| 59 | 15630 | 16580 | 18080 | 17890 | 17050 | 22270 |
| 60 | 19960 | 20310 | 20380 | 20310 | 20240 | 24370 |
| 61 | 20120 | 19580 | 19450 | 19900 | 19760 | 23850 |
| 62 | 19490 | 20000 | 20060 | 20950 | 20130 | 24390 |
| 63 | 19260 | 20380 | 20220 | 19960 | 19960 | 24250 |
| 64 | 19770 | 20760 | 20510 | 20630 | 20420 | 24850 |
| 65 | 20600 | 20510 | 20160 | 19960 | 20310 | 24540 |
| 66 | 20700 | 19260 | 18850 | 18850 | 19420 | 23310 |
| 67 | 19200 | 19770 | 18340 | 20600 | 19480 | 24070 |
| 68 | 19740 | 19290 | 18850 | 18880 | 19190 | 23500 |
| 69 | 18020 | 19520 | 19900 | 19930 | 19340 | 23760 |
| 70 | 19610 | 17990 | 17640 | 19680 | 18730 | 21930 |
| 71 | 22280 | 22440 | 21840 | 21930 | 22120 | 24060 |
| 72 | 21740 | 20980 | 21930 | 21050 | 21430 | 23940 |
| 73 | 19420 | 20920 | 21900 | 21740 | 21000 | 22710 |
| 74 | 19450 | 20440 | 20700 | 19040 | 19910 | 21500 |
| 75 | 17860 | 22280 | 22410 | 20600 | 20790 | 22120 |
| 76 | 22940 | 21960 | 22940 | 22850 | 22670 | 22880 |

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) and Nominal Concentration Values (Cont.)**

| Exp Day | Group 4 - Determined Concentration (mg/m$^3$)[a] | | | | | |
|---|---|---|---|---|---|---|
| | Individual Chamber Samples | | | | Mean | Nominal |
| 77 | 22940 | 22910 | 21710 | 22660 | 22560 | 23280 |
| 78 | 22810 | 20890 | 20980 | 21810 | 21620 | 22640 |
| 79 | 19550 | 19840 | 18210 | 18880 | 19120 | 21200 |
| 80 | 20190 | 19710 | 20730 | 19740 | 20090 | 22270 |
| 81 | 17950 | 18210 | 18270 | 20220 | 18660 | 23590 |
| 82 | 17440 | 20000 | 15820 | 19490 | 18190 | 22980 |
| 83 | 18910 | 19290 | 18690 | 18590 | 18870 | 23520 |
| 84 | 18050 | 20510 | 20730 | 19900 | 19800 | 23870 |
| 85 | 20890 | 20380 | 20950 | 21360 | 20900 | 24610 |
| 86 | 20470 | 20280 | 20570 | 20410 | 20430 | 24440 |
| 87 | 19610 | 20100 | 19610 | 19800 | 19780 | 23880 |
| 88 | 20920 | 20250 | 20310 | 21050 | 20630 | 23900 |
| 89 | 19870 | 19290 | 20280 | 20280 | 19930 | 23380 |
| 90 | 18590 | 21430 | 21550 | 21300 | 20720 | 24850 |
| 91 | 21080 | 20600 | 20470 | 20600 | 20690 | 25130 |
| 92 | 19200 | 23410 | 22810 | 22470 | 21970 | 24330 |
| 93 | 22500 | 22120 | 22000 | 21650 | 22070 | 23750 |
| 94 | 20160 | 22590 | 20270 | 22120 | 21290 | 22950 |
| 95 | 21490 | 19740 | 22560 | 21680 | 21370 | 23680 |
| 96 | 21520 | 22150 | 19520 | 19650 | 20710 | 21530 |
| 97 | 20950 | 20700 | 20440 | 20310 | 20600 | 22330 |
| 98 | 22440 | 21930 | 22750 | 22590 | 22430 | 24000 |
| 99 | 23320 | 23220 | 22590 | 22310 | 22860 | 23880 |
| 100 | 21330 | 20660 | 21580 | 22180 | 21440 | 22930 |
| 101 | 21840 | 21520 | 21430 | 21200 | 21500 | 23400 |
| 102 | 21050 | 21330 | 20730 | 21080 | 21050 | 22970 |
| 103 | 21680 | 21490 | 20700 | 20790 | 21170 | 22850 |
| 104 | 20510 | 23030 | 20510 | 22780 | 21710 | 22600 |
| 105 | 20310 | 17800 | 18620 | 22410 | 19790 | 21060 |
| 106 | 20630 | 18150 | 19650 | 18850 | 19320 | 21950 |
| 107 | 21330 | 20600 | 21810 | 20570 | 21080 | 22360 |
| 108 | 20850 | 20790 | 20250 | 20980 | 20720 | 22150 |
| 109 | 20350 | 19330 | 17540 | 19140 | 19090 | 21510 |
| 110 | 19930 | 21740 | 20980 | 22090 | 21190 | 22640 |
| 111 | 20120 | 22340 | 22970 | 22000 | 21860 | 23160 |
| 112 | 18720 | 21430 | 19520 | 20510 | 20050 | 21270 |
| 113 | 21330 | 19960 | 20060 | 20410 | 20440 | 22360 |
| 114 | 20000 | 20510 | 20380 | 20120 | 20250 | 21770 |

**Table 1 Atmosphere Concentration – Mean Exposure (IR Analysis) and Nominal Concentration Values (Cont.)**

| Exp Day | Group 4 - Determined Concentration (mg/m$^3$)[a] | | | | | |
|---|---|---|---|---|---|---|
| | Individual Chamber Samples | | | | Mean | Nominal |
| 115 | 19450 | 19490 | 18660 | 22180 | 19950 | 21880 |
| 116 | 20660 | 21360 | 20250 | 20000 | 20570 | 21650 |
| 117 | 20920 | 20920 | 20760 | 20950 | 20890 | 21750 |
| 118 | 20600 | 21430 | 20920 | 20920 | 20970 | 22030 |
| Mean | 20410 | | | | - | 23290 |
| SD | 1261 | | | | - | 991 |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

**Table 2 Chamber Temperature - Mean Values**

| Exposure Day | Temperature (°C)[a] | | | |
|---|---|---|---|---|
| | Group 1 | Group 2 | Group 3 | Group 4 |
| 1 | 21 | 21 | 21 | 21 |
| 2 | 22 | 22 | 22 | 22 |
| 3 | 22 | 21 | 21 | 21 |
| 4 | 23 | 23 | 23 | 23 |
| 5 | 22 | 22 | 22 | 22 |
| 6 | 22 | 21 | 22 | 22 |
| 7 | 22 | 22 | 21 | 22 |
| 8 | 22 | 21 | 22 | 22 |
| 9 | 21 | 22 | 21 | 21 |
| 10 | 21 | 21 | 21 | 20 |
| 11 | 20 | 20 | 20 | 20 |
| 12 | 22 | 22 | 22 | 22 |
| 13 | 22 | 22 | 21 | 21 |
| 14 | 21 | 21 | 21 | 21 |
| 15 | 21 | 21 | 21 | 21 |
| 16 | 22 | 22 | 22 | 22 |
| 17 | 21 | 21 | 21 | 22 |
| 18 | 22 | 22 | 22 | 22 |
| 19 | 21 | 21 | 21 | 21 |
| 20 | 21 | 21 | 21 | 21 |
| 21 | 21 | 22 | 21 | 21 |
| 22 | 21 | 22 | 21 | 22 |
| 23 | 20 | 21 | 20 | 21 |
| 24 | 20 | 21 | 21 | 21 |
| 25 | 21 | 21 | 21 | 21 |
| 26 | 20 | 21 | 21 | 20 |
| 27 | 21 | 21 | 21 | 21 |
| 28 | 21 | 21 | 21 | 21 |
| 29 | 20 | 21 | 21 | 21 |
| 30 | 20 | 21 | 21 | 21 |
| 31 | 20 | 21 | 21 | 21 |
| 32 | 20 | 21 | 21 | 21 |
| 33 | 20 | 21 | 20 | 21 |
| 34 | 21 | 21 | 21 | 21 |
| 35 | 21 | 21 | 21 | 21 |
| 36 | 21 | 22 | 22 | 22 |
| 37 | 20 | 22 | 21 | 22 |
| 38 | 20 | 21 | 21 | 22 |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

**Table 2 Chamber Temperature - Mean Values (Cont.)**

| Exposure Day | Temperature (°C)[a] | | | |
|---|---|---|---|---|
| | Group 1 | Group 2 | Group 3 | Group 4 |
| 39 | 21 | 21 | 21 | 21 |
| 40 | 21 | 21 | 21 | 21 |
| 41 | 21 | 21 | 21 | 21 |
| 42 | 21 | 22 | 21 | 21 |
| 43 | 20 | 22 | 21 | 21 |
| 44 | 21 | 22 | 22 | 22 |
| 45 | 21 | 22 | 21 | 22 |
| 46 | 21 | 21 | 21 | 21 |
| 47 | 21 | 22 | 21 | 21 |
| 48 | 21 | 22 | 21 | 21 |
| 49 | 21 | 22 | 22 | 22 |
| 50 | 22 | 22 | 22 | 23 |
| 51 | 21 | 22 | 22 | 22 |
| 52 | 21 | 22 | 22 | 22 |
| 53 | 21 | 23 | 23 | 23 |
| 54 | 21 | 22 | 22 | 22 |
| 55 | 21 | 22 | 22 | 23 |
| 56 | 22 | 24 | 23 | 24 |
| 57 | 23 | 23 | 23 | 24 |
| 58 | 21 | 22 | 21 | 22 |
| 59 | 20 | 21 | 21 | 21 |
| 60 | 21 | 21 | 21 | 22 |
| 61 | 21 | 22 | 21 | 21 |
| 62 | 23 | 23 | 23 | 23 |
| 63 | 23 | 24 | 23 | 24 |
| 64 | 21 | 22 | 22 | 22 |
| 65 | 21 | 22 | 22 | 22 |
| 66 | 20 | 21 | 21 | 21 |
| 67 | 21 | 22 | 22 | 22 |
| 68 | 20 | 21 | 21 | 21 |
| 69 | 21 | 22 | 22 | 22 |
| 70 | 22 | 23 | 22 | 22 |
| 71 | 23 | 23 | 23 | 24 |
| 72 | 23 | 25 | 24 | 24 |
| 73 | 24 | 25 | 24 | 24 |
| 74 | 23 | 23 | 23 | 24 |
| 75 | 22 | 24 | 23 | 24 |
| 76 | 22 | 24 | 23 | 23 |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

**Table 2 Chamber Temperature - Mean Values (Cont.)**

| Exposure Day | Temperature (°C)[a] | | | |
|---|---|---|---|---|
| | Group 1 | Group 2 | Group 3 | Group 4 |
| 77 | 23 | 23 | 23 | 23 |
| 78 | 22 | 22 | 22 | 22 |
| 79 | 22 | 22 | 22 | 22 |
| 80 | 23 | 23 | 22 | 23 |
| 81 | 22 | 22 | 22 | 22 |
| 82 | 24 | 23 | 23 | 23 |
| 83 | 23 | 23 | 23 | 23 |
| 84 | 23 | 24 | 23 | 24 |
| 85 | 25 | 25 | 25 | 25 |
| 86 | 23 | 24 | 23 | 24 |
| 87 | 23 | 24 | 24 | 24 |
| 88 | 24 | 25 | 24 | 24 |
| 89 | 23 | 24 | 23 | 24 |
| 90 | 23 | 24 | 23 | 23 |
| 91 | 23 | 24 | 24 | 24 |
| 92 | 22 | 23 | 22 | 23 |
| 93 | 22 | 22 | 22 | 22 |
| 94 | 21 | 21 | 21 | 21 |
| 95 | 22 | 22 | 22 | 20 |
| 96 | 20 | 21 | 21 | 21 |
| 97 | 21 | 22 | 21 | 22 |
| 98 | 22 | 22 | 22 | 23 |
| 99 | 24 | 24 | 24 | 24 |
| 100 | 23 | 23 | 23 | 23 |
| 101 | 22 | 22 | 22 | 23 |
| 102 | 23 | 23 | 23 | 23 |
| 103 | 22 | 23 | 22 | 22 |
| 104 | 23 | 23 | 23 | 23 |
| 105 | 22 | 23 | 22 | 23 |
| 106 | 23 | 23 | 23 | 23 |
| 107 | 23 | 23 | 24 | 24 |
| 108 | 23 | 23 | 23 | 23 |
| 109 | 22 | 23 | 22 | 23 |
| 110 | 22 | 22 | 22 | 23 |
| 111 | 22 | 23 | 23 | 23 |
| 112 | 22 | 23 | 23 | 23 |
| 113 | 23 | 23 | 24 | 24 |
| 114 | 22 | 22 | 22 | 23 |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

**Table 2 Chamber Temperature - Mean Values (Cont.)**

| Exposure Day | Temperature (°C)[a] | | | |
|---|---|---|---|---|
| | Group 1 | Group 2 | Group 3 | Group 4 |
| 115 | 20 | 20 | 20 | 21 |
| 116 | 19 | 19 | 20 | 20 |
| 117 | 18 | 18 | 18 | 19 |
| 118 | 17 | 18 | 18 | 19 |
| 119 | - | 19 | 18 | - |
| 120 | - | - | 18 | - |
| Mean | 22 | 22 | 22 | 22 |
| SD | 1.3 | 1.3 | 1.3 | 1.2 |

[a] **Refer to Section 6 Data, Abbreviations and Calculations for details.**

**Table 3 Chamber Relative Humidity - Mean Values**

| Exposure Day | Relative Humidity (%)[a] | | | |
|---|---|---|---|---|
| | Group 1 | Group 2 | Group 3 | Group 4 |
| 1 | 51 | 52 | 51 | 46 |
| 2 | 48 | 46 | 44 | 39 |
| 3 | 45 | 45 | 44 | 39 |
| 4 | 43 | 43 | 43 | 37 |
| 5 | 42 | 44 | 43 | 39 |
| 6 | 48 | 46 | 46 | 40 |
| 7 | 46 | 46 | 46 | 40 |
| 8 | 48 | 46 | 46 | 42 |
| 9 | 46 | 46 | 45 | 42 |
| 10 | 57 | 57 | 57 | 52 |
| 11 | 51 | 53 | 53 | 46 |
| 12 | 47 | 45 | 46 | 41 |
| 13 | 48 | 46 | 47 | 42 |
| 14 | 45 | 47 | 45 | 40 |
| 15 | 48 | 46 | 46 | 42 |
| 16 | 48 | 47 | 47 | 42 |
| 17 | 44 | 45 | 45 | 40 |
| 18 | 62 | 61 | 60 | 56 |
| 19 | 51 | 50 | 51 | 46 |
| 20 | 45 | 45 | 45 | 40 |
| 21 | 47 | 46 | 46 | 42 |
| 22 | 65 | 62 | 63 | 58 |
| 23 | 50 | 50 | 50 | 45 |
| 24 | 51 | 51 | 52 | 47 |
| 25 | 60 | 60 | 59 | 56 |
| 26 | 52 | 53 | 53 | 51 |
| 27 | 45 | 45 | 44 | 41 |
| 28 | 50 | 49 | 49 | 45 |
| 29 | 62 | 61 | 57 | 53 |
| 30 | 38 | 36 | 38 | 33 |
| 31 | 40 | 38 | 39 | 34 |
| 32 | 67 | 68 | 65 | 60 |
| 33 | 72 | 69 | 68 | 62 |
| 34 | 45 | 44 | 46 | 40 |
| 35 | 62 | 62 | 62 | 58 |
| 36 | 55 | 55 | 54 | 50 |
| 37 | 49 | 48 | 48 | 42 |
| 38 | 41 | 41 | 42 | 36 |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

**Table 3 Chamber Relative Humidity - Mean Values (Cont.)**

| Exposure Day | Relative Humidity (%)[a] | | | |
|---|---|---|---|---|
| | Group 1 | Group 2 | Group 3 | Group 4 |
| 39 | 34 | 36 | 35 | 31 |
| 40 | 36 | 37 | 37 | 32 |
| 41 | 42 | 41 | 41 | 37 |
| 42 | 43 | 42 | 42 | 37 |
| 43 | 50 | 46 | 47 | 42 |
| 44 | 53 | 51 | 51 | 47 |
| 45 | 56 | 54 | 55 | 50 |
| 46 | 55 | 54 | 54 | 49 |
| 47 | 55 | 54 | 55 | 50 |
| 48 | 54 | 52 | 54 | 49 |
| 49 | 57 | 55 | 57 | 52 |
| 50 | 59 | 57 | 59 | 53 |
| 51 | 58 | 55 | 56 | 51 |
| 52 | 61 | 57 | 59 | 55 |
| 53 | 62 | 58 | 61 | 54 |
| 54 | 64 | 59 | 62 | 56 |
| 55 | 66 | 64 | 63 | 56 |
| 56 | 61 | 57 | 58 | 52 |
| 57 | 58 | 65 | 61 | 54 |
| 58 | 55 | 52 | 54 | 49 |
| 59 | 45 | 44 | 44 | 40 |
| 60 | 57 | 56 | 57 | 51 |
| 61 | 64 | 64 | 65 | 60 |
| 62 | 56 | 59 | 60 | 54 |
| 63 | 49 | 50 | 52 | 46 |
| 64 | 62 | 63 | 62 | 57 |
| 65 | 54 | 52 | 54 | 48 |
| 66 | 54 | 52 | 52 | 47 |
| 67 | 55 | 53 | 54 | 49 |
| 68 | 42 | 42 | 43 | 37 |
| 69 | 56 | 53 | 53 | 49 |
| 70 | 60 | 59 | 59 | 55 |
| 71 | 55 | 54 | 57 | 50 |
| 72 | 58 | 57 | 57 | 51 |
| 73 | 56 | 56 | 59 | 53 |
| 74 | 55 | 54 | 54 | 49 |
| 75 | 60 | 60 | 60 | 55 |
| 76 | 62 | 59 | 61 | 56 |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

**Table 3 Chamber Relative Humidity - Mean Values (Cont.)**

| Exposure Day | Relative Humidity (%)[a] | | | |
|---|---|---|---|---|
| | Group 1 | Group 2 | Group 3 | Group 4 |
| 77 | 55 | 54 | 55 | 49 |
| 78 | 58 | 58 | 58 | 52 |
| 79 | 58 | 60 | 61 | 57 |
| 80 | 56 | 56 | 57 | 52 |
| 81 | 59 | 60 | 62 | 56 |
| 82 | 55 | 58 | 59 | 55 |
| 83 | 54 | 55 | 56 | 50 |
| 84 | 55 | 55 | 59 | 53 |
| 85 | 61 | 64 | 65 | 60 |
| 86 | 57 | 57 | 58 | 53 |
| 87 | 60 | 58 | 59 | 54 |
| 88 | 57 | 59 | 58 | 53 |
| 89 | 60 | 58 | 59 | 54 |
| 90 | 62 | 62 | 60 | 55 |
| 91 | 63 | 62 | 62 | 57 |
| 92 | 60 | 63 | 63 | 59 |
| 93 | 57 | 61 | 59 | 53 |
| 94 | 58 | 63 | 60 | 56 |
| 95 | 59 | 66 | 64 | 62 |
| 96 | 64 | 62 | 64 | 61 |
| 97 | 65 | 66 | 69 | 68 |
| 98 | 58 | 61 | 60 | 60 |
| 99 | 62 | 63 | 62 | 62 |
| 100 | 59 | 59 | 59 | 58 |
| 101 | 61 | 58 | 58 | 58 |
| 102 | 60 | 60 | 59 | 60 |
| 103 | 62 | 59 | 59 | 61 |
| 104 | 61 | 59 | 61 | 61 |
| 105 | 61 | 60 | 63 | 61 |
| 106 | 61 | 64 | 60 | 58 |
| 107 | 59 | 58 | 59 | 59 |
| 108 | 58 | 58 | 57 | 57 |
| 109 | 59 | 58 | 57 | 59 |
| 110 | 61 | 60 | 60 | 63 |
| 111 | 61 | 60 | 59 | 58 |
| 112 | 62 | 61 | 59 | 60 |
| 113 | 61 | 64 | 60 | 60 |
| 114 | 66 | 69 | 66 | 67 |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

**Table 3 Chamber Relative Humidity - Mean Values (Cont.)**

| Exposure Day | Relative Humidity (%)[a] | | | |
|---|---|---|---|---|
| | Group 1 | Group 2 | Group 3 | Group 4 |
| 115 | 59 | 62 | 62 | 61 |
| 116 | 63 | 61 | 63 | 60 |
| 117 | 66 | 66 | 67 | 65 |
| 118 | 66 | 62 | 64 | 63 |
| 119 | - | 61 | 62 | - |
| 120 | - | - | 66 | - |
| Mean | 55 | 55 | 55 | 51 |
| SD | 7.5 | 7.6 | 7.6 | 8.4 |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.

**Table 4 Particle Size Analysis – Evaluation for Condensation Aerosol in Chambers**

| Exposure Week | Condensation Aerosol Evaluation[a] | | | |
|---|---|---|---|---|
| | Group 1 | Group 2 | Group 3 | Group 4 |
| Pretest | Absent | Absent | Absent | Absent |
| 1 | Absent | Absent | Absent | Absent |
| 2 | Absent | Absent | Absent | Absent |
| 3 | Absent | Absent | Absent | Absent |
| 4 | Absent | Absent | Absent | Absent |
| 5 | Absent | Absent | Absent | Absent |
| 6 | Absent | Absent | Absent | Absent |
| 7 | Absent | Absent | Absent | Absent |
| 8 | Absent | Absent | Absent | Absent |
| 9 | Absent | Absent | Absent | Absent |
| 10 | Absent | Absent | Absent | Absent |
| 11 | Absent | Absent | Absent | Absent |
| 12 | Absent | Absent | Absent | Absent |
| 13 | Absent | Absent | Absent | Absent |
| 14 | Absent | Absent | Absent | Absent |
| 15 | Absent | Absent | Absent | Absent |
| 16 | Absent | Absent | Absent | Absent |
| 17 | Absent | Absent | Absent | Absent |

[a] Condensation aerosol within the chambers was determined as either present or absent.

## Table 5 Chamber Oxygen Level – Individual and Mean Values

| Exposure Day | Oxygen (%)[a] | | | |
|---|---|---|---|---|
| | Group 1 | Group 2 | Group 3 | Group 4 |
| Pretest | 19.3 | 19.7 | 19.3 | 19.3 |
| Beginning | 19.6 | 19.8 | 19.7 | 19.6 |
| Middle | 19.2 | 19.3 | 19.2 | 19.4 |
| End | 20.2 | 20.0 | 19.9 | 20.0 |
| On-test Mean[b] | 19.7 | 19.7 | 19.6 | 19.7 |
| On-test SD[b] | 0.5 | 0.4 | 0.4 | 0.3 |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.
[b] Excludes pretest values; on-test exposure values only.

## Table 6 Exposure Room Environmental Monitoring

| Exposure Week | Room Air Conc.[a] mg/m$^3$ | | Light Foot Candles | | Noise Decibels | |
|---|---|---|---|---|---|---|
| | Front | Back | Front | Back | Front | Back |
| Pretest | 0 | 6.072 | 36 | 36 | 63.3 | 61.1 |
| Beginning | 0 | 0 | 37 | 39 | 63.7 | 60.5 |
| Middle | 0 | 0 | 34 | 33 | 61.6 | 60.0 |
| End | 0 | 0 | 36 | 35 | 62.2 | 58.2 |
| On-test Mean[b] | 0 | 0 | 36 | 36 | 62.5 | 59.6 |
| On-test SD[b] | - | - | 1.5 | 3.1 | 1.1 | 1.2 |

[a] Refer to Section 6 Data, Abbreviations and Calculations for details.
[b] Excludes pretest values; on-test exposure values only.

## Annex 4 Anatomic pathology report

# PATHOLOGY REPORT

# GASOLINE ISOBUTANOL VAPOR CONDENSATE:

# A ONE-GENERATION INHALATION (WHOLE-BODY) REPRODUCTION TOXICITY STUDY IN RATS

# (GLP)

On 21 September 2015 the legal entity Huntingdon Life Sciences, Inc was renamed as Envigo CRS, Inc. No other changes to the legal entity have occurred.

| | |
|---|---|
| **HLS study number:** | 14-4417 |
| **Version ID:** | Final |
| **Issue date:** | 29 March 2016 |

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## PATHOLOGY REPORT

### GASOLINE ISOBUTANOL VAPOR CONDENSATE: A ONE-GENERATION INHALATION (WHOLE-BODY) REPRODUCTION TOXICITY STUDY IN RATS

[redacted]

Cynthia L. Courtney DVM, DACVP
Pathologist

29 MAR 16
Date

# 1. Introduction

## 1.1 Objective

The objective of this reproduction study was to provide general information concerning the effects of gasoline isobutanol vapor condensate on the integrity and performance of the male and female reproductive systems, including gonadal function, the estrous cycle, mating behavior, conception, gestation, parturition and lactation.

Gasoline isobutanol vapor condensate was administered via whole-body inhalation to rats for 6 hours/day during the exposure period(s) at exposures of 2,000, 10,000, and 20,000 mg/m$^3$. $F_0$ males and females received at least 70 consecutive days (10 weeks) of exposure prior to mating and continued to be exposed daily throughout a 21 day cohabitation period. Mated females were exposed daily from Gestation Day (GD) 0 through 18. Lactating $F_0$ females were exposed daily beginning on Lactation Day (LD) 5 until sacrifice of the $F_1$ offspring on LD 21. $F_0$ females with no confirmed day of mating continued to be exposed for 25 days following completion of the mating period. $F_0$ females with a confirmed day of mating that did not deliver were euthanized on presumed GD Day 25. $F_0$ males were exposed daily until euthanasia which occurred after delivery of the last $F_1$ litter.

At the end of the dosing phases, animals were euthanized, examined for gross abnormalities, and a partial list of protocol-specified organs were weighed, collected, and processed to slide, including lungs and bronchi, testes, epididymides, prostate, seminal vesicles, ovaries, uterus, vagina, adrenal glands, pituitary gland, and gross abnormalities. The partial list of the protocol-specified organs was examined microscopically for unscheduled decedents, air controls, and 20,000 mg/m$^3$ exposed animals. Gross abnormalities only were examined from the 2,000 and 10,000 mg/m$^3$ exposed animals.

# 2. Results

## 2.1 Unscheduled Decedents

One female (Animal No. 4507) was found dead on Gestation Day 22. No clinical signs were observed in this gravid female prior to death. Discoloration of the lungs was noted at necropsy but no significant microscopic findings were noted in the tissues examined. The death was considered a parturition-related mortality. One male (Animal No. 3002) was euthanized for humane reasons on Day 39 due to hind limb dysfunction. No macroscopic or microscopic findings were observed.

## 2.2 Organ Weights

### 2.2.1 Terminal sacrifice

No test substance-related organ weight changes were present in any terminal sacrifice animals.

## 2.3 Macropathology

### 2.3.1 Terminal sacrifice

No test substance-related macroscopic findings were noted in any terminal sacrifice animals.

All macroscopic findings occurred sporadically or at similar incidence and severity in control and test article treated groups and were considered incidental and due to biological variability.

## 2.4 Histopathology

### 2.4.1 Terminal sacrifice

No test substance-related microscopic changes were present in any terminal sacrifice animals.

All microscopic findings occurred sporadically or at similar incidence and severity in control and test article treated groups and were considered incidental and due to biological variability.

# 3. Pathologist's Comments

Whole body inhalation exposure to gasoline isobutanol vapor condensate at 2,000, 10,000, and 20,000 mg/m$^3$ was not associated with any organ weight changes or macroscopic or microscopic pathology observations in male and female Sprague-Dawley rats.

# Annex 5 Statistical analysis report

# STATISTICAL ANALYSIS REPORT

## Gasoline Isobutanol Vapor Condensate: A One-Generation Inhalation (Whole-Body) Reproduction Toxicity Study in Rats (GLP)

| | |
|---|---|
| **Envigo study number:** | 14-4417 |
| **Version ID:** | Final Report |
| **Issue date:** | 25 February 2016 |

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# Signature Page

## STATISTICAL ANALYSIS REPORT

## Gasoline Isobutanol Vapor Condensate: A One-Generation Inhalation (Whole-Body) Reproduction Toxicity Study in Rats (GLP)

[redacted]

25 February 2016

Gareth Thomas, BSc (Hons)
Contributing Scientist
Global Head of Statistics and Data Management
Statistics and Data Management Department
Envigo

Date

# 1. Introduction

$F_0$ mating data were supplied for estrous cycles, number of days to mating, number mating, number conceiving, number fertile and the number of live litters. $F_1$ litter data were also supplied for number viable and number lactating for post natal days (PND) 1 to 21.

# 2. Methodology

For estrous cycles an exact one-tailed (upper-tail) Linear-by-linear test (Cytel 1995) was applied to all groups, using scores appropriate to the severity of the observation assuming 4 day cycles to be normal. The categories were scored as follows: a 4 day cycle was scored as 4, a 4/5 day cycle was scored as 4.5, a 5 day cycle was scored as 5 and irregular, extended and acyclic cycles were scored as 6. If the test was statistically significant ($p<0.05$), the highest dose group was excluded and the test re-applied. This 'step-down' process was repeated until the test was no longer statistically significant ($p\geq0.05$). If the exact version of the Linear-by-linear test could not be calculated (due to the size of the table containing the data), then the asymptotic version was used instead.

For number of days to mating an exact one-tailed (upper-tail) Linear-by-linear test (Cytel 1995) was applied to all groups, using the following scores: a 1-4 day interval was scored as 1, a 5-8 day intervals was scored as 2, a 9-14 day interval was scored as 3, a 15-21 day interval was scored as 4. If the test was statistically significant ($p<0.05$), the highest dose group was excluded and the test re-applied. This 'step-down' process was repeated until the test was no longer statistically significant ($p\geq0.05$). If the exact version of the Linear-by-linear test could not be calculated (due to the size of the table containing the data), then the asymptotic version was used instead.

For number mating, number conceiving, number fertile, number live, number viable and number lactating an exact one-tailed (lower-tail) Cochran-Armitage test (Cytel 1995) was applied to all groups. If the test was statistically significant ($p<0.05$), the highest dose group was excluded and the test re-applied. This 'step down' process was repeated until the test was no longer statistically significant ($p\geq0.05$).

Statistical significance was declared at the 5% level.

# 3. Data Handling

The data for were supplied by email in an Excel spreadsheet and were manually transferred to StatXact 3 (Cytel 1995) for analysis.

# 4. Results

**Estrous cycles**

The exact Linear-by-linear test with all groups included was not statistically significant ($p$=0.723).

**Number of days to mating**

The exact Linear-by-linear test with all groups included was not statistically significant ($p$=0.413).

**Number mating**

For both males and females, the exact Cochran-Armitage test with all groups included was not statistically significant at the ($p$=0.847).

**Number conceiving**

For both males and females, the exact Cochran-Armitage test with all groups included was not statistically significant at the ($p$=0.102).

**Number fertile**

For both males and females, the exact Cochran-Armitage test with all groups included was not statistically significant at the ($p$=0.184).

**Number live**

No test was applied as all pregnant animals delivered live pups.

**Number viable**

The exact Cochran-Armitage test with all groups included was not statistically significant at the ($p$=0.997).

**Number lactating**

The exact Cochran-Armitage test with all groups included was not statistically significant at the ($p$=0.998).

# 5. References

Cytel (1995) *StatXact 3 for Windows: Statistical Software for Exact Nonparametric Inference*. Cytel Software Corporation, NC, USA.