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Shell Oil Company

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Houston, Texas 77210

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Office of Toxic Substances
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460
ATTN: 8(e) Coordinator

ORIGINAL

Dear Sir:

SUBJECT: DECREASED MOTOR ACTIVITY FOLLOWING INHALATION OF BUTYL ACETATE IN AN ACUTE NEUROTOXICITY STUDY IN RATS

The following information is submitted under TSCA 8(e).

Transient decreased motor activity was observed in rats immediately following inhalation of 3000 and 6000 ppm butyl acetate in an acute neurotoxicity study; the effect was not seen the day after exposure. Although butyl acetate is known to be a central nervous system depressant at vapor concentrations of 7,000-17,500 ppm, the finding of transient decreased motor activity at lower doses is considered a previously unknown effect.

This study was sponsored by the Chemical Manufacturers Association Oxo Process Panel, to which Shell Oil Company is a member, as part of a program to evaluate the neurotoxicity potential of several industrial solvents. Attached is a copy of the unaudited progress report by Eastman Kodak Company Toxicological Sciences Laboratory, which was submitted to the CMA. The Agency will receive a complete final report from CMA when it is available.

This report is filed to provide information EPA may find useful. In no way is it intended as a waiver of any rights or privileges belonging to Shell Oil Company as the reporting corporation, its agents or employees. The reporting corporation, its agents and employees, reserve the right to object to this report's use or admissibility in any subsequent judicial or administrative proceeding against the corporation, its agents or employees.

This report has been compiled based on information available as of the date of filing. The corporation, its agents and employees reserve the right to supplement the data contained in this report, and to revise and amend any conclusions drawn therefrom.

51 pp.

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This report contains no confidential business information.

The following person should be contacted if you have questions or a need for discussion.

J. C. Willett
Manager, Product Safety and Compliance
Shell Oil Company
P.O. Box 4320
Houston, TX 77210
Telephone No. 713-241-6958
Fax. 713-241-3325

Very truly yours,

R. N. Shulman

R. N. Shulman, General Manager
Health, Safety and Environment
Shell Oil Company

Attachment

THG/sjh

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

OFFICE OF
PESTICIDES AND TOXIC
SUBSTANCES

AUG 16 1994

R.N. Shulman
General Manager
Health, Safety, and Environment
Shell Oil Company
One Shell Plaza
P.O. Box 4320
Houston, Texas 77210

EPA acknowledges the receipt of information submitted by your organization on a "For Your Information" (FYI) voluntary basis. For your reference, copies of the first page(s) of your submission(s) are enclosed and display the TSCA FYI Document Control Number (e.g., FYI-00-0000) assigned by EPA to your submission(s). Please cite this number when submitting follow-up or supplemental information and refer to the reverse side of this page for "EPA Information Requests".

All FYI submissions are placed in the public files unless confidentiality is claimed according to the same procedures as outlined in Part X of EPA's TSCA §8(e) policy statement (43 FR 11110, March 16, 1978). The enclosure "Support Information for Confidentiality Claims" is included for your reference.

Please address any further correspondence with the Agency related to this FYI submission to:

Document Processing Center (7407)
Attn: FYI Coordinator
Office of Pollution Prevention and Toxics
U.S. Environmental Protection Agency
Washington, D.C. 20460-0001

EPA looks forward to continued cooperation with your organization in its ongoing efforts to evaluate and manage potential risks posed by chemicals to health and the environment.

Sincerely,

Terry R. O'Bryan

Terry R. O'Bryan
Risk Analysis Branch

Enclosure

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Contains No CBI

UNAUDITED PROGRESS REPORT

n-BUTYL ACETATE

AN ACUTE INHALATION NEUROTOXICITY STUDY IN THE RAT

HAEL NO. 93-0305 KAN 900710
CAS NO. 000123-86-4

PERFORMING LABORATORY

Toxicological Sciences Laboratory
Corporate Health and Environment Laboratories
Eastman Kodak Company
1100 Ridgeway Avenue
B-320 Kodak Park
Rochester, New York 14652-3615

STUDY SPONSOR

Oxo Process Panel
Chemical Manufacturers Association
2501 M Street, NW
Washington, DC 20037

Sponsor's Representative:
Barbara O. Francis

LABORATORY PROJECT ID

93-0305I2

UNAUDITED PROGRESS REPORT

n-BUTYL ACETATE

AN ACUTE INHALATION NEUROTOXICITY STUDY IN THE RAT

HAEL NO. 93-0305 KAN 900710
CAS NO. 000123-86-4

SUMMARY

Male and female Sprague-Dawley rats (CRL:CD®(SD)BR/VAF Plus™) were randomly distributed into 4 groups of 10 per sex per group which were further separated into 4 replicates of 5 animals per group per replicate. Two replicates consisted of male rats and the other two replicates consisted of female rats. Each replicate was exposed to concentrations of 0, 1500, 3000, and 6000 ppm of n-butyl acetate (99% pure) for a single 6-hour period. The replicates were exposed on consecutive days to allow time for post-exposure motor activity measurement and a functional-observational battery. Test atmospheres were generated by pumping the liquid onto glass beads in a distillation column which was connected to a round-bottom flask. Evaporation was enhanced by wrapping the column with heating tape. Exhaust from the generator was mixed with HEPA-filtered dilution air prior to entering the 420L chamber. The absence of aerosol particles greater than > 0.3 μm was confirmed by sampling with a Micro Laser Particle Counter. The exposure concentrations were monitored by IR spectroscopy using a Miran 1A spectrometer. Readings were recorded at least every hour. The time-weighted averages were within 10% of the target concentrations and are presented in the attached tables. Air flow, temperature, and humidity were recorded every 30 minutes. Mean values for temperature and humidity are presented in the attached tables. The oxygen concentration was measured during exposure to insure that a minimum of 19% was present.

Motor activity was determined using a San Diego Instruments horizontal photobeam cage-activity system. The measurement period was 60 minutes with the cumulative beam breaks at each 10 minute interval tabulated. The total ambulations (single beam breaks) were also tabulated. The motor activity of each replicate was measured prior to exposure on Day -6 at the same approximate time of day as the scheduled measurement post-exposure. Motor activity was also measured on Day 0 (day of exposure) immediately after the exhausting of the chamber (~ 30 min), on Day 1 approximately 26 hrs after the initiation of exposure, and on Days 7 and 14. Mean beam breaks and standard deviations are presented in the attached tables. The data from the control group in each replicate were compared statistically to determine if significance differences occurred. Since none were found, the data from each replicate of the same sex were combined for further analysis. Total motor activity and total ambulations on Day 0 (post-exposure) by the 3000 and 6000 ppm male and female groups were significantly lower than by the control groups. Mean total motor activity by the 3000

and 6000 ppm groups was roughly half of the activity by the control groups. No differences were noted on Days 1, 7, or 14.

A functional-observational battery (FOB) was performed on all animals the Friday prior to the exposure, and again after motor activity determination on Day 0. FOB was also performed on Days 7 and 14. On Day 0, the hair coat scores of the 6000 ppm male and female groups were significantly higher than the control groups indicating that the hair coat appeared slightly unkempt. In addition, forelimb grip strength of the female 3000 ppm group on Day 0 was significantly higher than of the control group. No differences were noted on Days 7 and 14. Tables summarizing the FOB scores and incidences of behavior are attached.

Individual animal body weights were measured on Day 0 prior to exposure, and on Days 7 and 14 after FOB. Male 6000 ppm rats had lower mean body weights on Days 7 and 14 than did the control group. Male 1500 ppm rats also had lower mean body weights on Day 7, but not at any other time. The differences in body weight between treated and control groups were less than 10%. No differences were noted among female rats.

Animals were observed every 30 minutes during exposure and daily thereafter unless FOB was performed. Observations made during exposures only included the animals which were visible through the inhalation chamber windows. It was not possible to record animal numbers or assign clinical sign severity scores to individual animals, thus it should be recognized that the during exposure observations were incomplete and subjective. No clinical conditions were observed in control animals. Treated groups had minimal reduced activity (hypoactivity) and response to external stimulus (tapping on the chamber) beginning immediately after onset of exposure and continuing until the end of exposure. At 6000 ppm, the severity of hypoactivity progressed to minor and moderate. At 3000 ppm, the severity of hypoactivity in female rats progressed to minor while male 3000 ppm rats were characterized as having minimal hypoactivity. Only minimal hypoactivity was observed at 1500 ppm. Sialorrhea was also observed in treated male rats, but only occasionally in female treated rats. Tearing was also noted occasionally in female treated rats. No deaths were noted during exposure and no clinical conditions were noted at any time post-exposure.

No treatment-related gross lesions were noted at necropsy.

Conclusion

The range-finding study with n-butyl acetate demonstrated that CNS depression occurs at high exposure concentrations. The results of the present study confirm that concentrations of 3000 and 6000 ppm reduce activity during exposure, as well as motor activity immediately after exposure. This effect is transient in that no differences were noted the day after exposure, and the effects were not observable during the FOB after motor activity on Day 0. The no-observed effect level (NOEL) for reduction in motor activity was 1500 ppm although exposure to this concentration was associated with reduced activity during exposure.

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SUMMARY OF EXPOSURE CONDITIONS

TARGET CONCENTRATION (PPM)	0	1500	3000	6000
TIME-WEIGHTED AVERAGE (PPM)				
Male	0.0[a] 0.0 2	1559.8 24.9 2	3195.1 198.5 2	6255.1 305.9 2
Female	0.0 0.0 2	1549.1 96.3 2	3122.7 5.8 2	6296.7 195.6 2
NOMINAL CONCENTRATION (PPM)				
Male	0.00[a] 0.0 2	1899.45 0.0 2	3920.70 0.0 2	9352.15 0.0 2
Female	0.00 0.0 2	2107.30 0.0 2	4198.75 0.0 2	9221.05 0.0 2
TEMPERATURE (F)				
Male	74.6[a] 0.8 12	74.9 0.6 12	77.7 3.2 12	75.6 0.9 12
Female	74.0 0.7 12	74.4 0.3 12	77.1 1.8 12	75.0 0.6 12
RELATIVE HUMIDITY (%)				
Male	66.3[a] 5.3 12	43.9 3.1 12	59.0 6.9 12	60.0 9.8 12
Female	65.7 10.7 12	55.4 9.7 12	66.1 13.1 12	51.0 13.8 12

Key: a = Data presented as mean, standard deviation, and number of samples.

FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY - MALE RATS

	PRE-EXPOSURE			
	Control	1500 ppm	3000 ppm	6000 ppm
AUTONOMIC PARAMETERS				
Lacrimation Score	1.0	1.0	1.0	1.0
Salivation Score	1.0	1.0	1.0	1.0
Nasal Discharge Score	1.1	1.0	1.0	1.0
Palpebral Closure Score	1.0	1.0	1.0	1.0
Mean No. Urination Pools	0.7	0.7	0.6	1.3
Mean No. Defecation	4.8	4.6	3.5	4.1
Pupillary Size				
Normal	9	10	9	9
Dilated	0	0	0	0
Constricted	1	0	1	1
NEUROMUSCULAR PARAMETERS				
Muscle Tone				
Normal	10	10	10	10
Tense and firm	0	0	0	0
Soft and flabby	0	0	0	0
Mean Grip Strength (grams)				
Forelimb	570	535	568	528
Hindlimb	236	246	244	271
Landing Foot Splay (mm)	11.11	10.67	10.68	11.34
Righting Reflex Score	1.0	1.0	1.0	1.0
Hypotonic Gait Score				
Forelimb	1.0	1.0	1.0	1.0
Hindlimb	1.0	1.0	1.0	1.0
Ataxic Gait Score	1.0	1.0	1.0	1.0
Abnormal Gait				
Normal	10	10	10	10
Steppage	0	0	0	0
Spastic Gait	0	0	0	0
Hypermetia	0	0	0	0
Duck-walk	0	0	0	0
Scissor Gait	0	0	0	0
Knuckling-over	0	0	0	0
Crossing-over	0	0	0	0
Splayed Walking	0	0	0	0

Data presented as mean severity score or incidence of behavior/appearance.

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FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY - MALE RATS

	PRE-EXPOSURE			
	Control	1500 ppm	3000 ppm	6000 ppm
SENSORIMOTOR RESPONSES				
Approach Response Score	1.1	1.5	1.2	1.5
Touch Response Score	1.1	1.2	1.3	1.3
Pinna Touch Response Score	2.0	2.1	1.8	2.0
Visual Placing Score	1.0	1.2	1.0	1.1
Tail Pinch Response Score	1.5	1.8	1.2	1.7
Auditory Orientation				
Oriented	10	10	9	10
Did Not Orient	0	0	1	0
CNS EXCITABILITY				
Removal From Cage Score	1.4	1.5	1.5	1.9
Arousal Level Score	1.1	1.2	1.1	1.3
Level of Arousal/Alertness				
Increased Arousal	1	2	1	3
Decreased Arousal	0	0	0	0
Spontaneous Vocalization				
No vocalizations	5	5	5	4
1-5 vocalizations	2	3	5	5
Most vocalizations occur during handling	3	2	0	1
Vocalizes without stimulation	0	0	0	0
Tremor Severity Score	1.0	1.0	1.0	1.0
Tremor Induction				
Intentional Tremors	0	0	0	0
Resting Tremors	0	0	0	0
Convulsion Severity	1.0	1.0	1.0	1.0
Convulsion Induction				
Intentional Convulsions	0	0	0	0
Spontaneous Convulsions	0	0	0	0
Type of Convulsion				
No Convulsions	10	10	10	10
Chewing Only	0	0	0	0
Clonic Tremors of Entire Body	0	0	0	0
Tonic Convulsion	0	0	0	0
Spasmodic Jumping	0	0	0	0

Data presented as mean severity score or incidence of behavior/appearance.

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FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY - MALE RATS

	PRE-EXPOSURE			
	Control	1500 ppm	3000 ppm	6000 ppm
CNS ACTIVITY				
Body Position - Home Cage				
Normal	10	10	10	10
Flattened, limbs may be extended	0	0	0	0
Lying on side	0	0	0	0
Sitting, head held low	0	0	0	0
Rearing repeatedly	0	0	0	0
Vertical jumping	0	0	0	0
Circiing Purposelessly	0	0	0	0
Pacing Purposelessly	0	0	0	0
Writhing	0	0	0	0
No observation - Animal in Feeder	0	0	0	0
Body Position - Open Field				
Normal	10	10	10	10
Flattened, limbs may be extended	0	0	0	0
Lying on side, nonresponsive	0	0	0	0
Sitting, head held low	0	0	0	0
Rearing repeatedly	0	0	0	0
Vertical jumping	0	0	0	0
Circling Purposelessly	0	0	0	0
Pacing Purposelessly	0	0	0	0
Writhing	0	0	0	0
Stereotypies				
Normal	10	10	10	10
Head flick	0	0	0	0
Head search	0	0	0	0
Prancing	0	0	0	0
Circling	0	0	0	0
Waltzing	0	0	0	0
Side-to-side rocking	0	0	0	0

Data presented as mean severity score or incidence of behavior/appearance.

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FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY - MALE RATS

	PRE-EXPOSURE			
	Control	1500 ppm	3000 ppm	6000 ppm
CNS ACTIVITY, CONTINUED				
Bizarre Behavior				
Normal	10	10	10	10
Hallucinatory	0	0	0	0
Compulsive biting	0	0	0	0
Self-destructive biting	0	0	0	0
Compulsive licking	0	0	0	0
Upright walking	0	0	0	0
Aimless wandering	0	0	0	0
Retropulsion	0	0	0	0
Spatial disorientation	0	0	0	0
PHYSIOLOGICAL				
Hair Coat Score	1.0	1.0	1.0	1.0
General Body Condition Score	1.0	1.0	1.0	1.0
Feces Amount Score	1.0	1.0	1.0	1.0
Feces Consistency Score	1.0	1.0	1.0	1.0
Piloerection				
None	10	10	10	10
Present	0	0	0	0
Eye Prominence				
Normal	10	10	10	10
Exophthalmos	0	0	0	0
Respiratory Difficulty				
Normal	10	10	10	10
Rales	0	0	0	0
Retching	0	0	0	0
Dyspneic	0	0	0	0
Gasping	0	0	0	0

Data presented as mean severity score or incidence of behavior/appearance.

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FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY - MALE RATS

	DAY 0				DAY 7				DAY 14			
	Control	1500 ppm	3000 ppm	6000 ppm	Control	1500 ppm	3000 ppm	6000 ppm	Control	1500 ppm	3000 ppm	6000 ppm
CNS ACTIVITY, CONTINUED												
Bizarre Behavior												
Normal	10	10	10	10	10	10	10	10	10	10	10	10
Hallucinatory	0	0	0	0	0	0	0	0	0	0	0	0
Compulsive biting	0	0	0	0	0	0	0	0	0	0	0	0
Self-destructive biting	0	0	0	0	0	0	0	0	0	0	0	0
Compulsive licking	0	0	0	0	0	0	0	0	0	0	0	0
Upright walking	0	0	0	0	0	0	0	0	0	0	0	0
Aimless wandering	0	0	0	0	0	0	0	0	0	0	0	0
Retropulsion	0	0	0	0	0	0	0	0	0	0	0	0
Spatial disorientation	0	0	0	0	0	0	0	0	0	0	0	0
PHYSIOLOGICAL												
Hair Coat Score	1.0	1.0	1.0	1.3 [a]	1.0	1.0	1.1	1.0	1.1	1.0	1.0	1.0
General Body Condition Score	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Feces Amount Score	...	...	...	...	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Feces Consistency Score	...	...	...	...	1.0	1.0	1.1	1.0	1.0	1.0	1.0	1.0
Piloerection												
None	9	10	10	9	10	10	9	10	9	10	10	10
Present	1	0	0	1	0	0	1	0	1	0	0	0
Eye Prominence												
Normal	9	10	10	10	10	10	10	9	10	10	10	10
Exophthalmos	1	0	0	0	0	0	0	1	0	0	0	0
Respiratory Difficulty												
Normal	10	10	10	10	10	10	10	10	10	10	10	10
Rales	0	0	0	0	0	0	0	0	0	0	0	0
Retching	0	0	0	0	0	0	0	0	0	0	0	0
Dyspneic	0	0	0	0	0	0	0	0	0	0	0	0
Gasping	0	0	0	0	0	0	0	0	0	0	0	0

[a] Significantly different from control group, one way ANOVA, p</= 0.05

... No data were collected because animals were in cages only fifteen minutes prior to FOB.

Data presented as mean severity score or incidence of behavior/appearance.

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FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY - MALE RATS

	DAY 0				DAY 7				DAY 14			
	Control	1500 ppm	3000 ppm	6000 ppm	Control	1500 ppm	3000 ppm	6000 ppm	Control	1500 ppm	3000 ppm	6000 ppm
CNS ACTIVITY												
Body Position - Home Cage												
Normal	9	10	10	10	10	10	10	10	10	10	10	10
Flattened, limbs may be extended	0	0	0	0	0	0	0	0	0	0	0	0
Lying on side	0	0	0	0	0	0	0	0	0	0	0	0
Sitting, head held low	1	0	0	0	0	0	0	0	0	0	0	0
Rearing repeatedly	0	0	0	0	0	0	0	0	0	0	0	0
Vertical jumping	0	0	0	0	0	0	0	0	0	0	0	0
Circling Purposelessly	0	0	0	0	0	0	0	0	0	0	0	0
Pacing Purposelessly	0	0	0	0	0	0	0	0	0	0	0	0
Writhing	0	0	0	0	0	0	0	0	0	0	0	0
No observation - Animal in Feeder	0	0	0	0	0	0	0	0	0	0	0	0
Body Position - Open Field												
Normal	9	10	9	8	10	10	9	10	10	10	10	9
Flattened, limbs may be extended	1	0	0	0	0	0	0	0	0	0	0	0
Lying on side, nonresponsive	0	0	0	0	0	0	0	0	0	0	0	0
Sitting, head held low	0	0	1	2	0	0	1	0	0	0	0	1
Rearing repeatedly	0	0	0	0	0	0	0	0	0	0	0	0
Vertical jumping	0	0	0	0	0	0	0	0	0	0	0	0
Circling Purposelessly	0	0	0	0	0	0	0	0	0	0	0	0
Pacing Purposelessly	0	0	0	0	0	0	0	0	0	0	0	0
Writhing	0	0	0	0	0	0	0	0	0	0	0	0
Stereotypies												
Normal	10	10	10	10	10	10	10	10	10	10	10	10
Head flick	0	0	0	0	0	0	0	0	0	0	0	0
Head search	0	0	0	0	0	0	0	0	0	0	0	0
Prancing	0	0	0	0	0	0	0	0	0	0	0	0
Circling	0	0	0	0	0	0	0	0	0	0	0	0
Waltzing	0	0	0	0	0	0	0	0	0	0	0	0
Side-to-side rocking	0	0	0	0	0	0	0	0	0	0	0	0

Data presented as mean severity score or incidence of behavior/appearance.

UNAUDITED

FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY - MALE RATS

	DAY 0				DAY 7				DAY 14			
	Control	1500 ppm	3000 ppm	6000 ppm	Control	1500 ppm	3000 ppm	6000 ppm	Control	1500 ppm	3000 ppm	6000 ppm
SENSORIMOTOR RESPONSES												
Approach Response Score	1.4	1.5	1.5	1.5	1.5	1.5	1.4	1.4	1.3	1.5	1.4	1.2
Touch Response Score	1.4	1.2	1.1	1.4	1.4	1.3	1.0	1.3	1.5	1.3	1.2	1.5
Pinna Touch Response Score	1.3	2.2	2.7	2.1	1.4	2.0	1.4	1.6	1.6	1.5	1.4	1.9
Visual Placing Score	1.2	1.2	1.0	1.1	1.2	1.2	1.1	1.0	1.1	1.2	1.1	1.0
Tail Pinch Response Score	1.8	1.9	1.4	1.9	1.8	1.6	1.3	1.7	1.8	2.1	1.4	1.7
Auditory Orientation												
Oriented	10	10	9	10	10	10	10	10	10	10	10	9
Did Not Orient	0	0	1	0	0	0	0	0	0	0	0	1
CNS EXCITABILITY												
Removal From Cage Score	1.5	1.6	1.5	1.6	1.4	1.5	1.5	1.6	1.3	1.4	1.5	1.4
Arousal Level Score	1.2	1.3	1.0	1.5	1.2	1.1	1.2	1.1	1.3	1.2	1.2	1.5
Level of Arousal/Alertness												
Increased Arousal	1	2	0	1	0	0	0	0	0	2	0	3
Decreased Arousal	1	1	0	4	2	1	2	1	3	0	2	2
Spontaneous Vocalization												
No vocalizations	2	4	4	7	0	5	5	4	4	4	5	5
1-5 vocalizations	5	2	5	3	9	4	4	6	3	5	5	4
Most vocalizations occur during handling	3	4	1	0	1	1	1	0	3	1	0	1
Vocalizes without stimulation	0	0	0	0	0	0	0	0	0	0	0	0
Tremor Severity Score	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Tremor Induction												
Intentional Tremors	0	0	0	0	0	0	0	0	0	0	0	0
Resting Tremors	0	0	0	0	0	0	0	0	0	0	0	0
Convulsion Severity	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Convulsion Induction												
Intentional Convulsions	0	0	0	0	0	0	0	0	0	0	0	0
Spontaneous Convulsions	0	0	0	0	0	0	0	0	0	0	0	0
Type of Convulsion												
No Convulsions	10	10	10	10	10	10	10	10	10	10	10	10
Chewing Only	0	0	0	0	0	0	0	0	0	0	0	0
Clonic Tremors of Entire Body	0	0	0	0	0	0	0	0	0	0	0	0
Tonic Convulsion	0	0	0	0	0	0	0	0	0	0	0	0
Spasmodic Jumping	0	0	0	0	0	0	0	0	0	0	0	0

Data presented as mean severity score or incidence of behavior/appearance.

UNAUDITED

3

FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY - MALE RATS

	DAY 0				DAY 7				DAY 14			
	Control	1500 ppm	3000 ppm	6000 ppm	Control	1500 ppm	3000 ppm	6000 ppm	Control	1500 ppm	3000 ppm	6000 ppm
AUTONOMIC PARAMETERS												
Lacrimation Score	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Salivation Score	1.0	1.0	1.0	1.2	1.0	1.0	1.0	1.0	1.1	1.0	1.0	1.2
Nasal Discharge Score	1.0	1.0	1.0	1.0	1.1	1.0	1.0	1.1	1.0	1.0	1.0	1.0
Palpebral Closure Score	1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Mean No. Urination Pools	0.4	0.7	0.2	0.4	0.2	0.3	0.1	0.3	0.0	0.4	0.2	0.2
Mean No. Defecation	2.3	2.3	1.4	2.1	3.4	3.4	2.6	2.3	3.0	2.9	2.2	1.4
Pupillary Size												
Normal	8	6	7	7	8	9	9	5	8	7	6	7
Dilated	0	0	0	0	0	0	0	0	0	0	0	0
Constricted	2	4	3	3	2	1	1	5	2	3	4	3
NEUROMUSCULAR PARAMETERS												
Muscle Tone												
Normal	10	10	10	10	10	10	10	10	10	10	10	10
Tense and firm	0	0	0	0	0	0	0	0	0	0	0	0
Soft and flabby	0	0	0	0	0	0	0	0	0	0	0	0
Mean Grip Strength (grams)												
Forelimb	610	656	616	601	677	700	696	604	747	642	809	653
Hindlimb	334	328	340	386	400	407	377	470	372	390	[illegible]	433
Landing Foot Splay (mm)	10.00	10.37	9.45	9.90	10.24	10.59	11.33	9.79	10.85	10.18	[illegible]	10.18
Righting Reflex Score	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Hypotonic Gait Score												
Forelimb	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.0	1.0	1.0	1.0	1.0
Hindlimb	1.1	1.1	1.0	1.2	1.1	1.0	1.1	1.0	1.1	1.0	1.0	1.0
Ataxic Gait Score	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Abnormal Gait												
Normal	10	10	10	10	10	10	10	10	10	10	10	
Steppage	0	0	0	0	0	0	0	0	0	0	0	0
Spastic Gait	0	0	0	0	0	0	0	0	0	0	0	0
Hypermetia	0	0	0	0	0	0	0	0	0	0	0	0
Duck-walk	0	0	0	0	0	0	0	0	0	0	0	0
Scissor Gait	0	0	0	0	0	0	0	0	0	0	0	0
Knuckling-over	0	0	0	0	0	0	0	0	0	0	0	0
Crossing-over	0	0	0	0	0	0	0	0	0	0	0	0
Splayed Walking	0	0	0	0	0	0	0	0	0	0	0	0

Data presented as mean severity score or incidence of behavior/appearance.

FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY - FEMALE RATS

	PRE-EXPOSURE			
	Control	1500 ppm	3000 ppm	6000 ppm
AUTONOMIC PARAMETERS				
Lacrimation Score	1.0	1.0	1.0	1.0
Salivation Score	1.0	1.0	1.0	1.0
Nasal Discharge Score	1.0	1.0	1.0	1.0
Palpebral Closure Score	1.0	1.0	1.0	1.0
Mean No. Urination Pools	0.5	0.4	0.2	0.5
Mean No. Defecation	1.2	1.6	1.9	1.3
Pupillary Size				
Normal	10	10	10	8
Dilated	0	0	0	0
Constricted	0	0	0	2
NEUROMUSCULAR PARAMETERS				
Muscle Tone				
Normal	10	10	10	10
Tense and firm	0	0	0	0
Soft and flabby	0	0	0	0
Mean Grip Strength (grams)				
Forelimb	499	453	471	481
Hindlimb	232	246	216	211
Landing Foot Splay (mm)	8.65	8.78	9.61	7.74
Righting Reflex Score	1.0	1.0	1.0	1.0
Hypotonic Gait Score				
Forelimb	1.0	1.0	1.0	1.0
Hindlimb	1.0	1.0	1.0	1.0
Ataxic Gait Score	1.0	1.0	1.0	1.0
Abnormal Gait				
Normal	10	10	10	10
Steppage	0	0	0	0
Spastic Gait	0	0	0	0
Hypermetia	0	0	0	0
Duck-walk	0	0	0	0
Scissor Gait	0	0	0	0
Knuckling-over	0	0	0	0
Crossing-over	0	0	0	0
Splayed Walking	0	0	0	0

Data presented as mean severity score or incidence of behavior/appearance.

UNAUDITED

FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY - FEMALE RATS

	PRE-EXPOSURE			
	Control	1500 ppm	3000 ppm	6000 ppm
SENSORIMOTOR RESPONSES				
Approach Response Score	1.2	1.5	1.2	1.3
Touch Response Score	1.0	1.1	1.0	1.0
Pinna Touch Response Score	1.1	2.3	1.5	1.9
Visual Placing Score	1.1	1.0	1.0	1.0
Tail Pinch Response Score	1.5	1.6	1.4	1.4
Auditory Orientation				
Oriented	10	10	9	10
Did Not Oriented	0	0	1	0
CNS EXCITABILITY				
Removal From Cage Score	1.5	1.7	1.6	1.7
Arousal Level Score	1.3	1.6	1.3	1.4
Level of Arousal/Alertness				
Increased Arousal	2	5	3	4
Decreased Arousal	0	0	0	0
Spontaneous Vocalization				
No vocalizations	4	1	2	2
1-5 vocalizations	2	4	5	3
Most vocalizations occur during handling	4	5	3	5
Vocalizes without stimulation	0	0	0	0
Tremor Severity Score	1.0	1.0	1.0	1.0
Tremor Induction				
Intentional Tremors	0	0	0	0
Resting Tremors	0	0	0	0
Convulsion Severity	1.0	1.0	1.0	1.0
Convulsion Induction				
Intentional Convulsions	0	0	0	0
Spontaneous Convulsions	0	0	0	0
Type of Convulsion				
No Convulsions	10	10	10	10
Chewing Only	0	0	0	0
Clonic Tremors of Entire Body	0	0	0	0
Tonic Convulsion	0	0	0	0
Spasmodic Jumping	0	0	0	0

Data presented as mean severity score or incidence of behavior/appearance.

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FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY - FEMALE RATS

	PRE-EXPOSURE			
	Control	1500 ppm	3000 ppm	6000 ppm
CNS ACTIVITY				
Body Position - Home Cage				
Normal	10	10	10	10
Flattened, limbs may be extended	0	0	0	0
Lying on side	0	0	0	0
Sitting, head held low	0	0	0	0
Rearing repeatedly	0	0	0	0
Vertical jumping	0	0	0	0
Circling Purposelessly	0	0	0	0
Pacing Purposelessly	0	0	0	0
Writhing	0	0	0	0
No observation - Animal in Feeder	0	0	0	0
Body Position - Open Field				
Normal	10	10	10	10
Flattened, limbs may be extended	0	0	0	0
Lying on side, nonresponsive	0	0	0	0
Sitting, head held low	0	0	0	0
Rearing repeatedly	0	0	0	0
Vertical jumping	0	0	0	0
Circling Purposelessly	0	0	0	0
Pacing Purposelessly	0	0	0	0
Writhing	0	0	0	0
Stereotypies				
Normal	10	10	10	10
Head flick	0	0	0	0
Head search	0	0	0	0
Prancing	0	0	0	0
Circling	0	0	0	0
Waltzing	0	0	0	0
Side-to-side rocking	0	0	0	0

Data presented as mean severity score or incidence of behavior/appearance.

UNAUDITED

FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY - FEMALE RATS

	PRE-EXPOSURE			
	Control	1500 ppm	3000 ppm	6000 ppm
CNS ACTIVITY, CONTINUED				
Bizarre Behavior				
Normal	10	10	10	10
Hallucinatory	0	0	0	0
Compulsive biting	0	0	0	0
Self-destructive biting	0	0	0	0
Compulsive licking	0	0	0	0
Upright walking	0	0	0	0
Aimless wandering	0	0	0	0
Retropulsion	0	0	0	0
Spatial disorientation	0	0	0	0
PHYSIOLOGICAL				
Hair Coat Score	1.0	1.0	1.0	1.0
General Body Condition Score	1.0	1.0	1.0	1.0
Feces Amount Score	1.0	1.0	1.1	1.0
Feces Consistency Score	1.0	1.0	1.0	1.0
Piloerection				
None	10	10	10	10
Present	0	0	0	0
Eye Prominence				
Normal	10	10	10	10
Exophthalmos	0	0	0	0
Respiratory Difficulty				
Normal	10	10	10	10
Rales	0	0	0	0
Retching	0	0	0	0
Dyspneic	0	0	0	0
Gasping	0	0	0	0

Data presented as mean severity score or incidence of behavior/appearance.

UNAUDITED

FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY - FEMALE RATS

	DAY 0				DAY 7				DAY 14			
	Control	1500 ppm	3000 ppm	6000 ppm	Control	1500 ppm	3000 ppm	6000 ppm	Control	1500 ppm	3000 ppm	6000 ppm
CNS ACTIVITY, CONTINUED												
Bizarre Behavior												
Normal	10	10	10	10	10	10	10	10	10	10	10	10
Hallucinatory	0	0	0	0	0	0	0	0	0	0	0	0
Compulsive biting	0	0	0	0	0	0	0	0	0	0	0	0
Self-destructive biting	0	0	0	0	0	0	0	0	0	0	0	0
Compulsive licking	0	0	0	0	0	0	0	0	0	0	0	0
Upright walking	0	0	0	0	0	0	0	0	0	0	0	0
Aimless wandering	0	0	0	0	0	0	0	0	0	0	0	0
Retropulsion	0	0	0	0	0	0	0	0	0	0	0	0
Spatial disorientation	0	0	0	0	0	0	0	0	0	0	0	0
PHYSIOLOGICAL												
Hair Coat Score	1.0	1.0	1.0	1.6 [a]	1.0	1.0	1.0	1.0	1.1	1.0	1.0	1.0
General Body Condition Score	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Feces Amount Score	---	---	---	---	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Feces Consistency Score	---	---	---	---	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Piloerection												
None	10	10	10	9	10	10	10	10	10	10	10	10
Present	0	0	0	1	0	0	0	0	0	0	0	0
Eye Prominence												
Normal	10	10	10	10	10	10	10	10	9	9	10	10
Exophthalmos	0	0	0	0	0	0	0	0	1	1	0	0
Respiratory Difficulty												
Normal	10	10	10	10	10	10	10	10	10	10	10	10
Rales	0	0	0	0	0	0	0	0	0	0	0	0
Retching	0	0	0	0	0	0	0	0	0	0	0	0
Dyspneic	0	0	0	0	0	0	0	0	0	0	0	0
Gasping	0	0	0	0	0	0	0	0	0	0	0	0

[a] Significantly different from control group, one way ANOVA, p</= 0.05.

--- No data were collected because animals were in cages only fifteen minutes prior to FOB.

Data presented as mean severity score or incidence of behavior/appearance

UNAUDITED

FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY - FEMALE RATS

	DAY 0				DAY 7				DAY 14			
	Control	1500 ppm	3000 ppm	6000 ppm	Control	1500 ppm	3000 ppm	6000 ppm	Control	1500 ppm	3000 ppm	6000 ppm
CNS ACTIVITY												
Body Position - Home Cage												
Normal	10	9	10	10	10	10	10	10	10	10	10	10
Flattened, limbs may be extended	0	0	0	0	0	0	0	0	0	0	0	0
Lying on side	0	0	0	0	0	0	0	0	0	0	0	0
Sitting, head held low	0	1	0	0	0	0	0	0	0	0	0	0
Rearing repeatedly	0	0	0	0	0	0	0	0	0	0	0	0
Vertical jumping	0	0	0	0	0	0	0	0	0	0	0	0
Circling Purposelessly	0	0	0	0	0	0	0	0	0	0	0	0
Pacing Purposelessly	0	0	0	0	0	0	0	0	0	0	0	0
Writhing	0	0	0	0	0	0	0	0	0	0	0	0
No observation - Animal in Feeder	0	0	0	0	0	0	0	0	0	0	0	0
Body Position - Open Field												
Normal	10	10	10	9	10	9	10	10	10	9	10	10
Flattened, limbs may be extended	0	0	0	0	0	0	0	0	0	0	0	0
Lying on side, nonresponsive	0	0	0	0	0	0	0	0	0	0	0	0
Sitting, head held low	0	0	0	1	0	1	0	0	0	1	0	0
Rearing repeatedly	0	0	0	0	0	0	0	0	0	0	0	0
Vertical jumping	0	0	0	0	0	0	0	0	0	0	0	0
Circling Purposelessly	0	0	0	0	0	0	0	0	0	0	0	0
Pacing Purposelessly	0	0	0	0	0	0	0	0	0	0	0	0
Writhing	0	0	0	0	0	0	0	0	0	0	0	0
Stereotypies												
Normal	10	10	10	10	10	10	10	10	10	10	10	10
Head flick	0	0	0	0	0	0	0	0	0	0	0	0
Head search	0	0	0	0	0	0	0	0	0	0	0	0
Prancing	0	0	0	0	0	0	0	0	0	0	0	0
Circling	0	0	0	0	0	0	0	0	0	0	0	0
Waltzing	0	0	0	0	0	0	0	0	0	0	0	0
Side-to-side rocking	0	0	0	0	0	0	0	0	0	0	0	0

Data presented as mean severity score or incidence of behavior/appearance.

UNAUDITED

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FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY - FEMALE RATS

	DAY 0				DAY 7				DAY 14			
	Control	1500 ppm	3000 ppm	6000 ppm	Control	1500 ppm	3000 ppm	6000 ppm	Control	1500 ppm	3000 ppm	6000 ppm
SENSORIMOTOR RESPONSES												
Approach Response Score	1.4	1.3	1.2	1.5	1.3	1.6	1.5	1.3	1.4	1.5	1.2	1.4
Touch Response Score	1.2	1.0	1.1	1.0	1.1	1.1	1.4	1.2	1.1	1.3	1.4	1.2
Pinna Touch Response Score	1.4	2.1	1.8	2.0	1.5	1.8	1.4	2.5	1.4	2.0	1.6	2.1
Visual Placing Score	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Tail Pinch Response Score	1.3	1.9	1.8	1.5	1.6	1.8	2.3	1.6	1.6	1.8	1.8	1.7
Auditory Orientation												
Oriented	9	10	10	9	9	8	10	8	9	7	10	9
Did Not Oriented	1	0	0	1	1	2	0	2	1	3	0	1
CNS EXCITABILITY												
Removal From Cage Score	1.4	1.5	1.5	1.6	1.4	1.5	1.5	1.6	1.5	1.5	1.5	1.6
Arousal Level Score	1.5	1.5	1.2	1.6	1.4	1.7	1.2	1.5	1.7	1.8	1.7	1.9
Level of Arousal/Alertness												
Increased Arousal	5	5	2	3	4	5	2	4	5	6	6	7
Decreased Arousal	0	0	0	2	0	1	0	0	0	0	0	0
Spontaneous Vocalization												
No vocalizations	4	3	2	4	6	7	4	7	2	7	4	5
1-5 vocalizations	5	4	6	6	4	3	5	3	6	3	6	4
Most vocalizations occur during handling	1	3	2	0	0	0	1	0	2	0	0	1
Vocalizes without stimulation	0	0	0	0	0	0	0	0	0	0	0	0
Tremor Severity Score	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Tremor Induction												
Intentional Tremors	0	0	0	0	0	0	0	0	0	0	0	0
Resting Tremors	0	0	0	0	0	0	0	0	0	0	0	0
Convulsion Severity	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Convulsion Induction												
Intentional Convulsions	0	0	0	0	0	0	0	0	0	0	0	0
Spontaneous Convulsions	0	0	0	0	0	0	0	0	0	0	0	0
Type of Convulsion												
No Convulsions	10	10	10	10	10	10	10	10	10	10	10	10
Chewing Only	0	0	0	0	0	0	0	0	0	0	0	0
Clonic Tremors of Entire Body	0	0	0	0	0	0	0	0	0	0	0	0
Tonic Convulsion	0	0	0	0	0	0	0	0	0	0	0	0
Spasmodic Jumping	0	0	0	0	0	0	0	0	0	0	0	0

Data presented as mean severity score or incidence of behavior/appearance.

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FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY - FEMALE RATS

	DAY 0				DAY 7				DAY 14			
	Control	1500 ppm	3000 ppm	6000 ppm	Control	1500 ppm	3000 ppm	6000 ppm	Control	1500 ppm	3000 ppm	6000 ppm
AUTONOMIC PARAMETERS												
Lacrimation Score	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Salivation Score	1.0	1.1	1.1	1.3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Nasal Discharge Score	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Palpebral Closure Score	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Mean No. Urination Pools	0.1	0.1	0.2	0.1	0.0	0.3	0.0	0.1	0.1	0.2	0.0	0.2
Mean No. Defecation	0.1	0.1	0.1	0.1	0.0	1.4	0.0	0.6	0.0	0.6	0.0	0.6
Pupillary Size												
Normal	5	5	9	6	6	8	10	7	6	8	8	7
Dilated	0	0	0	0	0	0	0	0	0	0	0	0
Constricted	5	5	1	4	4	2	0	3	4	2	2	3
NEUROMUSCULAR PARAMETERS												
Muscle Tone												
Normal	10	10	10	10	10	10	10	10	10	9	10	10
Tense and firm	0	0	0	0	0	0	0	0	0	0	0	0
Soft and flabby	0	0	0	0	0	0	0	0	0	1	0	0
Mean Grip Strength (grams)												
Forelimb	542	606	642 [a]	539	579	559	567	566	601	628	576	599
Hindlimb	304	282	266	318	338	317	350	357	317	353	312	359
Landing Foot Splay (num)	8.41	8.87	8.35	8.59	8.53	8.71	9.01	8.29	8.15	9.32	8.87	8.79
Righting Reflex Score	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Hypotonic Gait Score												
Forelimb	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Hindlimb	1.0	1.0	1.0	1.1	1.0	1.1	1.0	1.0	1.0	1.1	1.0	1.1
Ataxic Gait Score	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Abnormal Gait												
Normal	10	10	10	10	10	9	10	10	10	9	10	10
Steppage	0	0	0	0	0	0	0	0	0	0	0	0
Spastic Gait	0	0	0	0	0	0	0	0	0	0	0	0
Hypermetia	0	0	0	0	0	0	0	0	0	0	0	0
Duck-walk	0	0	0	0	0	0	0	0	0	0	0	0
Scissor Gait	0	0	0	0	0	0	0	0	0	0	0	0
Knuckling-over	0	0	0	0	0	0	0	0	0	0	0	0
Crossing-over	0	0	0	0	0	0	0	0	0	0	0	0
Splayed Walking	0	0	0	0	0	1	0	0	0	1	0	0

[a] Significantly different from control group, one way ANOVA, p</= 0.05.

Data presented as mean severity score or incidence of behavior/appearance.

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MOTOR ACTIVITY BY MALE RATS

GROUP	TIME INTERVAL (minutes) 10	20	30	40	50	60	Total Motor Activity	Total Ambulations
				PRE-EXPOSURE				
CONTROL	124.1 [a]	102.0	75.5	87.5	83.0	73.0	545.7	216.3
	36.1	23.0	23.5	29.5	30.6	37.3	152.2	79.2
	10	10	10	10	10	10	10	10
1500 ppm	138.1	107.8	92.3	89.2	81.5	75.7	584.6	224.8
	22.0	32.7	10.5	37.3	21.0	14.4	97.5	68.2
	10	10	10	10	10	10	10	10
3000 ppm	121.8	100.3	87.5	98.9	87.6	71.1	567.2	229.3
	27.9	31.2	51.5	46.9	40.7	32.6	176.3	124.1
	10	10	10	10	10	10	10	10
6000 ppm	122.3	105.8	76.5	64.0	68.6	56.0	493.2	164.4
	27.0	24.2	15.9	20.0	33.9	32.1	109.9	65.9
	10	10	10	10	10	10	10	10

[a] Data presented as mean beam breaks, standard deviation, and animals per group.

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AC MOTOR ACTIVITY BY MALE RATS

GROUP	TIME INTERVAL (minutes) 10	20	30	40	50	60	Total Motor Activity	Total Ambulations
DAY 0								
CONTROL	89.7[a]	59.5	41.8	42.3	31.9	28.5	293.7	84.6
	27.9	18.0	27.7	22.9	28.1	32.5	85.4	46.0
	10	10	10	10	10	10	10	10
1500 ppm	91.4	60.3	48.1	36.8	33.7	12.5[c]	282.8	76.6
	16.5	27.8	17.2	29.6	30.6	25.6	90.0	53.7
	10	10	10	10	10	10	10	10
3000 ppm	81.2	40.2	23.7	3.6	10.9	4.3[c]	163.9[b]	35.6[b]
	23.8	33.0	19.9	4.8	15.6	8.2	71.1	27.6
	10	10	10	10	10	10	10	10
6000 ppm	61.5[b]	43.3	10.5[b]	12.2[c]	25.6	8.0[c]	161.1[b]	25.1[b]
	35.1	22.0	16.3	17.4	23.0	9.2	61.3	17.9
	10	10	10	10	10	10	10	10
DAY 1								
CONTROL	91.4	63.3	49.2	54.9	50.5	41.2	350.5	106.8
	36.7	16.9	22.3	22.3	23.9	21.6	99.6	50.7
	10	10	10	10	10	10	10	10
1500 ppm	100.0	78.6	67.8	61.0	69.0	48.3	424.7	145.6
	19.0	25.7	25.2	34.9	29.6	32.6	131.4	91.5
	10	10	10	10	10	10	10	10
3000 ppm	105.4	63.7	59.0	53.7	51.0	43.7	376.5	118.6
	29.0	33.0	22.6	34.3	29.7	31.6	139.2	76.4
	10	10	10	10	10	10	10	10
6000 ppm	114.7	62.9	58.1	48.6	41.6	46.1	372.0	96.3
	29.4	16.5	20.8	23.0	31.7	39.6	95.0	47.8
	10	10	10	10	10	10	10	10

[a] Data presented as mean beam breaks, standard deviation, and animals per group.

[b] Significantly different from control group, one way ANOVA, p </= 0.05.

[c] Significantly different from control group, Mann Whitney, p </= 0.05.

UNAUDITED

MOTOR ACTIVITY BY MALE RATS

GROUP	TIME INTERVAL (minutes) 10	20	30	40	50	60	Total Motor Activity	Total Ambulations
				DAY 7				
CONTROL	96.9 [a]	69.6	51.9	43.9	33.8	41.1	337.2	95.2
	25.3	29.3	26.8	26.4	23.0	33.4	136.7	62.6
	10	10	10	10	10	10	10	10
1500 ppm	108.8	73.1	57.9	41.4	33.7	42.5	357.4	109.7
	20.6	30.0	18.0	28.7	26.2	26.7	109.2	63.1
	10	10	10	10	10	10	10	10
3000 ppm	99.5	72.2	53.3	42.8	27.5	40.4	335.7	97.3
	35.2	14.6	14.0	34.7	26.5	27.4	100.7	42.8
	10	10	10	10	10	10	10	10
6000 ppm	99.3	64.3	61.2	50.8	34.6	21.7	331.9	91.6
	27.7	22.8	31.9	28.8	26.1	28.3	99.4	44.3
	10	10	10	10	10	10	10	10
				DAY 14				
CONTROL	106.5	72.9	48.3	42.4	41.8	40.9	352.8	107.3
	19.4	27.3	21.4	21.4	24.8	29.3	93.8	50.4
	10	10	10	10	10	10	10	10
1500 ppm	113.8	77.4	62.4	61.8	53.2	34.4	403.0	145.1
	26.9	18.0	20.8	17.6	39.9	26.3	64.5	39.0
	10	10	10	10	10	10	10	10
3000 ppm	104.8	76.2	57.0	57.3	39.9	38.9	374.1	118.8
	34.0	26.3	21.5	39.3	20.8	27.6	93.6	60.8
	10	10	10	10	10	10	10	10
6000 ppm	114.7	64.6	56.2	42.8	30.5	16.2	325.0	94.3
	31.0	16.9	28.0	30.0	27.4	15.5	94.5	45.7
	10	10	10	10	10	10	10	10

[a] Data presented as mean beam breaks, standard deviation, and animals per group.

UNAUDITED

MOTOR ACTIVITY BY FEMALE RATS

GROUP	TIME INTERVAL (minutes) 10	20	30	40	50	60	Total Motor Activity	Total Ambulations
				PRE-EXPOSURE				
CONTROL	127.8 [a]	103.7	96.9	64.8	38.1	47.6	478.9	174.0
	20.3	26.7	33.6	49.2	46.6	57.0	186.8	86.3
	10	10	10	10	10	10	10	10
1500 ppm	116.8	76.0	82.7	53.1	51.7	56.1	436.4	156.8
	26.7	39.8	37.5	42.8	37.1	37.5	184.1	81.4
	10	10	10	10	10	10	10	10
3000 ppm	124.7	89.4	100.9	79.1	66.6	51.4	512.1	171.5
	18.4	23.8	29.0	16.4	34.2	38.6	106.8	43.5
	10	10	10	10	10	10	10	10
6000 ppm	121.2	94.4	72.9	67.4	46.1	46.7	448.7	156.6
	19.3	15.1	35.0	39.5	36.1	27.8	130.4	56.8
	10	10	10	10	10	10	10	10

[a] Data presented as mean beam breaks, standard deviation, and animals per group.

UNAUDITED

MOTOR ACTIVITY BY FEM RATS

GROUP	TIME INTERVAL (minutes) 10	20	30	40	50	60	Total Motor Activity	Total Ambulations
				DAY 0				
CONTROL	123.5 [a]	78.7	57.7	40.2	46.8	57.7	404.6	138.3
	29.1	29.7	32.6	43.5	39.2	35.7	158.6	92.9
	10	10	10	10	10	10	10	10
1500 ppm	99.7	68.3	37.2	28.9	20.2	20.9 [c]	275.2	80.9
	42.4	36.1	37.0	36.3	22.3	30.8	136.9	55.8
	10	10	10	10	10	10	10	10
3000 ppm	100.7	49.9 [b]	21.5	13.9	20.0	13.9 [c]	219.9 [b]	57.0 [c]
	14.2	26.1	23.0	26.5	35.2	23.2	67.1	22.0
	10	10	10	10	10	10	10	10
6000 ppm	79.9 [b]	28.1 [b]	29.7	11.7	10.9	0.0 [c]	160.3 [b]	29.0 [c]
	35.9	27.5	25.0	23.1	22.3	0.0	87.4	30.3
	10	10	10	10	10	10	10	10
				DAY 1				
CONTROL	122.5	84.9	75.4	78.9	72.5	50.8	485.0	188.7
	35.8	34.9	39.4	34.0	39.9	44.5	190.9	114.0
	10	10	10	10	10	10	10	10
1500 ppm	101.6	76.4	53.5	43.5	44.8	38.9	358.7	112.9
	36.7	28.8	22.3	26.3	40.1	37.9	112.4	69.2
	10	10	10	10	10	10	10	10
3000 ppm	108.7	84.0	77.3	63.6	80.1	68.9	482.6	180.1
	18.7	16.2	19.4	34.4	48.9	29.2	88.6	55.9
	10	10	10	10	10	10	10	10
6000 ppm	92.2	61.1	56.0	49.7	59.7	40.7	359.4	125.1
	19.8	33.6	33.8	31.5	39.2	33.5	135.9	62.8
	10	10	10	10	10	10	10	10

[a] Data presented as mean beam breaks, standard deviation, and animals per group.

[b] Significantly different from control group, one way ANOVA, p </= 0.05.

[c] Significantly different from control group, Mann Whitney, p </= 0.05.

MOTOR ACTIVITY BY FEMALE RATS

GROUP	TIME INTERVAL (minutes) 10	20	30	40	50	60	Total Motor Activity	Total Ambulations
				DAY 7				
CONTROL	122.5[a]	88.5	67.9	54.5	45.8	37.6	416.8	154.2
	35.7	27.6	36.9	37.4	38.0	43.3	192.6	115.1
	10	10	10	10	10	10	10	10
1500 ppm	112.0	75.4	59.1	42.0	26.1	42.3	356.9	106.6
	40.0	34.4	34.1	34.7	26.3	34.5	155.5	55.7
	10	10	10	10	10	10	10	10
3000 ppm	121.3	82.9	70.3	44.6	43.6	53.0	415.7	155.0
	20.0	19.5	28.4	19.9	40.5	33.3	86.3	52.1
	10	10	10	10	10	10	10	10
6000 ppm[b]	117.2	94.8	55.0	47.6	45.4	68.2	428.2	159.8
	20.6	28.8	30.7	36.0	34.2	34.7	131.4	79.8
	10	10	10	10	10	10	10	10
				DAY 14				
CONTROL	119.8	100.3	68.5	64.7	56.2	57.6	467.1	161.8
	35.7	33.6	27.3	35.0	31.8	30.0	156.0	104.8
	10	10	10	10	10	10	10	10
1500 ppm	115.9	86.2	58.5	58.0	49.1	38.9	406.6	134.7
	29.0	24.0	28.1	32.7	37.4	26.6	117.2	57.3
	10	10	10	10	10	10	10	10
3000 ppm	123.4	90.3	78.0	73.2	51.8	42.3	459.0	162.2
	23.2	24.4	30.9	27.3	34.0	38.1	90.4	49.6
	10	10	10	10	10	10	10	10
6000 ppm	118.5	84.4	57.0	62.2	64.0	37.7	423.8	151.0
	32.2	38.2	38.6	40.3	30.7	29.6	159.0	78.9
	10	10	10	10	10	10	10	10

[a] Data presented as mean beam breaks, standard deviation, and animals per group.

UNAUDITED

MEAN ANIMAL BODY WEIGHTS (GRAMS) - MALES

	0 PPM	1500 PPM	3000 PPM	6000 PPM
WEEK # 1				
PRE-EXP	290.0 8.0 10	286.0 10.1 10	292.0 10.9 10	282.3 10.8 10
DAY 0	322.6 11.6 10	313.4 14.4 10	323.9 14.9 10	311.7 12.9 10
DAY 7	367.4 14.8 10	351.8 * 18.7 10	361.2 18.9 10	332.9 * 11.7 10
WEEK # 2				
DAY 14	405.5 20.6 10	385.4 23.9 10	403.0 24.5 10	375.6 * 13.8 10

KEY: FOR EACH GROUP, VALUES ARE REPORTED AS - MEAN
+/- STANDARD DEVIATION
NUMBER PER GROUP

* - STATISTICALLY DIFFERENT FROM CONTROL (P</= 0.05)

UNA D

MEAN ANIMAL BODY WE S (GRA ALES

	0 PPM	15	PM	6000 PPM
WEEK # 1				
PRE-EXP	211		10.2 7.5 10	213.2 5.7 10
DAY 0	23 1	9 0 0	225.1 8.4 10	227.9 10.1 10
DAY 7	246.8 11.5 10	243 12	238.7 11.7 10	235.9 13.8 10
WEEK # 2				
DAY 14	253.9 14.2 10	256 17. 10	248.1 13.4 10	252.2 13.0 10

KEY: FOR EACH GROUP, VALUES ARE REPORTED AS -
ANDARD DEVIATION
NUMBER PER GROUP

UNAUDITED

Severity of Clinical Signs During Exposure

Male Rats

Repetition A

Group/Dose Level	Time	Normal	Hypoactivity - reduced response to stimulus	Sialorrhea
Group 1 0 ppm	6:58	N		
	7:33	N		
	8:02	N		
	8:30	N		
	9:00	N		
	9:30	N		
	10:00	N		
	10:30	N		
	11:00	N		
	11:30	N		
	12:00	N		
Group 2 1500 ppm	6:58		1	
	7:33		1	1
	8:02		1	1
	8:30		1	1
	9:00		1	
	9:30		1	
	10:00		1	
	10:30		1	
	11:00		1	
	11:30		1	
	12:00		1	
Group 3 3000 ppm	6:58		1	1
	7:33		1	1
	8:02		1	1
	8:30		1	1
	9:00		1	
	9:30		1	
	10:00		1	
	10:30		1	
	11:00		1	
	11:30		1	
	12:00		1	
Group 4 6000 ppm	6:58		1	1
	7:33		1	1
	8:02		1	1
	8:30		1	1
	9:00		1	
	9:30		2	
	10:00		2	
	10:30		2	
	11:00		2	
	11:30		2	
	12:00		2	

Severities: N = Normal, 1 = Minimal, 2 = Minor, 3 = Moderate, 4 = Severe.

UNAUDITED

Severity of Clinical Signs During Exposure

Rats

Repetition B

Group/Dose Level	Time	Normal	Hypoactivity - reduced response to stimulus	Sialorrhea
Group 1 0 ppm	6:45	N		
	7:15	N		
	7:45	N		
	8:12	N		
	8:45	N		
	9:15	N		
	9:42	N		
	10:15	N		
	10:45	N		
	11:15	N		
	11:45	N		
	12:15	N		
Group 2 1500 ppm	6:45		1	
	7:15		1	
	7:45		1	
	8:12		1	
	8:45		1	
	9:15		1	
	9:42		1	
	10:15		1	
	10:45		1	
	11:15		1	
	11:45		1	
	12:15		1	
Group 3 3000 ppm	6:45		1	2
	7:15		1	2
	7:45		1	
	8:12		1	
	8:45		1	
	9:15		1	
	9:42		1	
	10:15		1	
	10:45		1	
	11:15		1	
	11:45		1	
	12:15		1	
Group 4 6000 ppm	6:45		1	3
	7:15		1	3
	7:45		2	2
	8:12		2	2
	8:45		2	2
	9:15		2	2
	9:42		2	2
	10:15		3	
	10:45		3	
	11:15		3	
	11:45		3	
	12:15		3	

Severities: N = Normal, 1 = Minimal, 2 = Minor, 3 = Moderate, 4 = Severe.

UNAUDITED

Severity of Clinical Signs During Exposure

Female Rats

Repetition C

Group/Dose Level	Time	Normal	Hypoactivity - reduced response to stimulus	Sialorrhea	Tearing
Group 1 0 ppm	6:50	N			
	7:24	N			
	7:55	N			
	8:25	N			
	8:52	N			
	9:17	N			
	9:50	N			
	10:20	N			
	10:50	N			
	11:20	N			
	11:50	N			
	12:15	N			
Group 2 1500 ppm	6:50		1		
	7:24		1		
	7:55		1		
	8:25		1		
	8:52		1		
	9:17		1		
	9:50		1		
	10:20		1		
	10:50		1		
	11:20		1		
	11:50		1		
	12:15		1		
Group 3 3000 ppm	6:50		1		
	7:24		1	1	
	7:55		2		
	8:25		2		
	8:52		2		
	9:17		1		
	9:50		1		
	10:20		1		
	10:50		1		
	11:20		2		
	11:50		2		
	12:15		2		
Group 4 6000 ppm	6:50		1		
	7:24		2	1	1
	7:55		3		
	8:25		3		
	8:52		2		
	9:17		2		
	9:50		2		
	10:20		2		
	10:50		2		
	11:20		3		
	11:50		3		
	12:15		3		

Severities: N = Normal, 1 = Minimal, 2 = Minor, 3 = Moderate 4 = Severe.

UNAUDITED

Severity of Clinical Signs During Exposure

Female Rats
Repetition D

Group/Dose Level	Time	Normal	Hypoactivity - reduced response to stimulus	Sialorrhea	Tearing
Group 1 0 ppm	6:45	N			
	7:15	N			
	7:50	N			
	8:15	N			
	8:40	N			
	9:15	N			
	9:45	N			
	10:15	N			
	10:45	N			
	11:15	N			
	11:45	N			
	12:15	N			
Group 2 1500 ppm	6:45		1		
	7:15		1		
	7:50		1		
	8:15		1		
	8:40		1		
	9:15		1		
	9:45		1		
	10:15		1		
	10:45		1		
	11:15		1		
	11:45		1		
	12:15		1		
Group 3 3000 ppm	6:45		1	1	
	7:15		1	2	
	7:50		1	2	
	8:15		2		
	8:40		2		
	9:15		2		
	9:45		2		
	10:15		2		
	10:45		2		
	11:15		2		
	11:45		2		
	12:15		2		
Group 4 6000 ppm	6:45		2	3	1
	7:15		2	3	1
	7:50		2	2	
	8:15		3		
	8:40		3		
	9:15		3		
	9:45		3		
	10:15		3		
	10:45		3		
	11:15		3		
	11:45		3		
	12:15		3		

Severities: N = Normal, 1 = Minimal, 2 = Minor, 3 = Moderate, 4 = Severe.

GROUPED SUMMARY OF CLINICAL SIGNS - MALE RATS

OBSERVATION PERIOD - A.M.

CLINICAL SIGN	NO. OF ANIMALS	MEAN ONSET DAY	ONSET S.D. #DAYS	ANIMALS AFFECTED
GROUP 1 - 0.000 PPM				
MOTOR ACTIVITY PERFORMED	10	1.	0.	201-210
FOB PERFORMED	10	7.	0.	201-210
INDUCED DEATH, SODIUM PENTOBARBITAL	3	16.	0.	201,204,210
INDUCED DEATH, CARBON DIOXIDE	7	16.	0.	202-203,205-209
GROUP 2 - 1500.000 PPM				
MOTOR ACTIVITY PERFORMED	10	1.	0.	211-220
FOB PERFORMED	10	7.	0.	211-220
INDUCED DEATH, SODIUM PENTOBARBITAL	3	16.	0.	211-212,218
INDUCED DEATH, CARBON DIOXIDE	7	16.	0.	213-217,219-220
GROUP 3 - 3000.000 PPM				
MOTOR ACTIVITY PERFORMED	10	1.	0.	221-230
FOB PERFORMED	10	7.	0.	221-230
INDUCED DEATH, SODIUM PENTOBARBITAL	3	16.	0.	221,223,226
INDUCED DEATH, CARBON DIOXIDE	7	16.	0.	222,224-225,227-230
GROUP 4 - 6000.000 PPM				
MOTOR ACTIVITY PERFORMED	10	1.	0.	231-240
FOB PERFORMED	10	7.	0.	231-240
INDUCED DEATH, CARBON DIOXIDE	7	16.	0.	231-233,235-236,239-240
INDUCED DEATH, SODIUM PENTOBARBITAL	3	16.	0.	234,237-238

KEY: *-INDICATES ANIMALS SHOWING ONLY CLINICAL EXAM NORMAL, MORIBUNDITY/MORTALITY CHECK NORMAL, CAGESIDE OBSERVATION NORMAL, OR CHAMBER OBSERVATION NORMAL

UNAUDITED

GROUPED SUMMARY OF CLINICAL SIGNS - MALE RATS

OBSERVATION PERIOD - P.M.

CLINICAL SIGN	NO. OF ANIMALS	MEAN ONSET DAY	ONSET S.D. #DAYS	ANIMALS AFFECTED
GROUP 1 - 0.000 PPM				
FOB PERFORMED	10	0.	0.	201-210
MOTOR ACTIVITY PERFORMED	10	0.	0.	201-210
GROUP 2 - 1500.000 PPM				
FOB PERFORMED	10	0.	0.	211-220
MOTOR ACTIVITY PERFORMED	10	0.	0.	211-220
GROUP 3 - 3000.000 PPM				
FOB PERFORMED	10	0.	0.	221-230
MOTOR ACTIVITY PERFORMED	10	0.	0.	221-230
GROUP 4 - 6000.000 PPM				
FOB PERFORMED	10	0.	0.	231-240
MOTOR ACTIVITY PERFORMED	10	0.	0.	231-240

KEY: *-INDICATES ANIMALS SHOWING ONLY CLINICAL EXAM NORMAL, MORIBUNDITY/MORTALITY CHECK NORMAL, CAGESIDE OBSERVATION NORMAL, OR CHAMBER OBSERVATION NORMAL

UNAUDITED

SUMMARY OF CLINICAL SIGNS - FEMALE RATS

OBSERVATION PERIOD - A.M.

CLINICAL SIGN	NO. OF ANIMALS	MEAN ONSET DAY	ONSET S.D. #DAYS	ANIMALS AFFECTED
GROUP 1 - 0.000 PPM				
MOTOR ACTIVITY PERFORMED	10	1.	0.	241-250
FOB PERFORMED	10	7.	0.	241-250
INDUCED DEATH, CARBON DIOXIDE	7	18.	0.	241-242,245-249
INDUCED DEATH, SODIUM PENTOBARBITAL	3	18.	0.	243-244,250
GROUP 2 - 1500.000 PPM				
MOTOR ACTIVITY PERFORMED	10	1.	0.	251-260
FOB PERFORMED	10	7.	0.	251-260
INDUCED DEATH, SODIUM PENTOBARBITAL	4	18.	0.	251-252,256,259
INDUCED DEATH, CARBON DIOXIDE	6	18.	0.	253-255,257-258,260
GROUP 3 - 3000.000 PPM				
MOTOR ACTIVITY PERFORMED	10	1.	0.	261-270
FOB PERFORMED	10	7.	0.	261-270
INDUCED DEATH, CARBON DIOXIDE	7	18.	0.	261,263-264,266-268,270
INDUCED DEATH, SODIUM PENTOBARBITAL	3	18.	0.	262,265,269
GROUP 4 - 6000.000 PPM				
MOTOR ACTIVITY PERFORMED	10	1.	0.	271-280
FOB PERFORMED	10	7.	0.	271-280
INDUCED DEATH, CARBON DIOXIDE	7	18.	0.	271-272,274-276,278,280
INDUCED DEATH, SODIUM PENTOBARBITAL	3	18.	0.	273,277,279

KEY: *-INDICATES ANIMALS SHOWING ONLY CLINICAL EXAM NORMAL, MORIBUNDITY/MORTALITY CHECK NORMAL, CAGESIDE OBSERVATION NORMAL, OR CHAMBER OBSERVATION NORMAL

UNAUDITED

GROUPED SUMMARY OF CAL SIGNS - FEMALE RATS

OBSERVATION PERIOD - P.M.

CLINICAL SIGN	NO. OF ANIMALS	MEAN ONSET DAY	ONSET S.D. #DAYS	ANIMALS AFFECTED
GROUP 1 - 0.000 PPM				
FOB PERFORMED	10	0.	0.	241-250
MOTOR ACTIVITY PERFORMED	10	0.	0.	241-250
GROUP 2 - 1500.000 PPM				
FOB PERFORMED	10	0.	0.	251-260
MOTOR ACTIVITY PERFORMED	10	0.	0.	251-260
GROUP 3 - 3000.000 PPM				
FOB PERFORMED	10	0.	0.	261-270
MOTOR ACTIVITY PERFORMED	10	0.	0.	261-270
GROUP 4 - 6000.000 PPM				
FOB PERFORMED	10	0.	0.	271-280
MOTOR ACTIVITY PERFORMED	10	0.	0.	271-280

KEY: *-INDICATES ANIMALS SHOWING ONLY CLINICAL EXAM NORMAL, MORIBUNDITY/MORTALITY CHECK NORMAL, CAGESIDE OBSERVATION NORMAL, OR CHAMBER OBSERVATION NORMAL

UNAUDITED

INDIVIDUAL ANIMAL CLINICAL SIGN - MALE RATS
0.00 PPM

ANIMAL #	201	202	203	204	205	206	207	208	209	210
OBSERVATION PERIOD - A.M.										
DAY # 0										
CLINICAL EXAMINATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 1										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 2										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 3										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 4										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 5										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 6										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 7										
FOB PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 8										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 9										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 10										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 11										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 12										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 13										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 14										
FOB PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 15										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
INDUCED DEATH, SODIUM PENTOBARBITAL										P
INDUCED DEATH, CARBON DIOXIDE						P	P	P	P	
DAY # 16										
CLINICAL EXAMINATION, NORMAL	N	N	N	N	N					
INDUCED DEATH, SODIUM PENTOBARBITAL		P		P						
INDUCED DEATH, CARBON DIOXIDE		P	P		P					
OBSERVATION PERIOD - P.M.										
DAY # 0										
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P
FOB PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 7										
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 14										
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P

UNAUDITED

INDIVIDUAL ANIMAL CLINICAL SIGNS - MALE RATS
1500.00 PPM

ANIMAL #	211	212	213	214	215	216	217	218	219	220
OBSERVATION PERIOD - A.M.										
DAY # 0										
CLINICAL EXAMINATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 1										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 2										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 3										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 4										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 5										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 6										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 7										
FOB PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 8										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 9										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 10										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 11										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 12										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 13										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 14										
FOB PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 15										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
INDUCED DEATH, SODIUM PENTOBARBITAL									P	
INDUCED DEATH, CARBON DIOXIDE						P	P		P	P
DAY # 16										
CLINICAL EXAMINATION, NORMAL	N	N	N	N	N					
INDUCED DEATH, SODIUM PENTOBARBITAL		P	P							
INDUCED DEATH, CARBON DIOXIDE			P	P	P					
OBSERVATION PERIOD - P.M.										
DAY # 0										
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P
FOB PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 7										
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 14										
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P

UNAUDITED

INDIVIDUAL ANIMAL CLINICAL SIGNS - MALE RATS
3000.00 PPM

ANIMAL #	221	222	223	224	225	226	227	228	229	230
OBSERVATION PERIOD - A.M.										
DAY # 0										
CLINICAL EXAMINATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 1										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 2										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 3										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 4										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 5										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 6										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 7										
FOB PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 8										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 9										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 10										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 11										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 12										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 13										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 14										
FOB PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 15										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
INDUCED DEATH, SODIUM PENTOBARBITAL							P			
INDUCED DEATH, CARBON DIOXIDE							P	P	P	P
DAY # 16										
CLINICAL EXAMINATION, NORMAL	N	N	N	N	N					
INDUCED DEATH, SODIUM PENTOBARBITAL		P		P						
INDUCED DEATH, CARBON DIOXIDE		P		P	P					
OBSERVATION PERIOD - P.M.										
DAY # 0										
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P
FOB PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 7										
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 14										
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P

UNAUDITED

INDIVIDUAL ANIMAL CLINICAL SIGNS - MALE RATS
6000.00 PPM

ANIMAL #	231	232	233	234	235	236	237	238	239	240
OBSERVATION PERIOD - A.M.										
DAY # 0										
CLINICAL EXAMINATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 1										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 2										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 3										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 4										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 5										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 6										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 7										
FOB PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 8										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 9										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 10										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 11										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 12										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 13										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 14										
FOB PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 15										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
INDUCED DEATH, SODIUM PENTOBARBITAL								P	P	
INDUCED DEATH, CARBON DIOXIDE						P			P	P
DAY # 16										
CLINICAL EXAMINATION, NORMAL	N	N	N	N	N					
INDUCED DEATH, SODIUM PENTOBARBITAL					P					
INDUCED DEATH, CARBON DIOXIDE	P	P	P		P					
OBSERVATION PERIOD - P.M.										
DAY # 0										
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P
FOB PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 7										
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 14										
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P

UNAUDITED

INDIVIDUAL ANIMAL CLINICAL SIGNS - FEMALE RATS

0.00 PPM

ANIMAL #	241	242	243	244	245	246	247	248	249	250
OBSERVATION PERIOD - A.M.										
DAY # 0										
CLINICAL EXAMINATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 1										
CLINICAL EXAMINATION, NORMAL	N	N	N	N	N	N	N	N	N	N
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 2										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 3										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 4										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 5										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 6										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 7										
FOB PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 8										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 9										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 10										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 11										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 12										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 13										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 14										
FOB PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 15										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
INDUCED DEATH, SODIUM PENTOBARBITAL										P
INDUCED DEATH, CARBON DIOXIDE						P	P	P	P	
DAY # 16										
CLINICAL EXAMINATION, NORMAL	N	N	N	N	N					
INDUCED DEATH, SODIUM PENTOBARBITAL				P	P					
INDUCED DEATH, CARBON DIOXIDE	P	P			P					
OBSERVATION PERIOD - P.M.										
DAY # 0										
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P
FOB PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 7										
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 14										
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P

UNAUDITED

INDIVIDUAL ANIMAL CLINICAL [illegible] - FEMALE RATS
1500.00 P[illegible]

ANIMAL #	251	252	253	254	255	256	257	258	259	260
OBSERVATION PERIOD - A.M.										
DAY # 0										
CLINICAL EXAMINATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 1										
CLINICAL EXAMINATION, NORMAL	N	N	N	N	N	N	N	N	N	N
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 2										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 3										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 4										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 5										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 6										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 7										
FOB PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 8										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 9										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 10										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 11										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 12										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 13										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 14										
FOB PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 15										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
INDUCED DEATH, SODIUM PENTOBARBITAL						P				P
INDUCED DEATH, CARBON DIOXIDE							P	P		P
DAY # 16										
CLINICAL EXAMINATION, NORMAL	N	N	N	N	N					
INDUCED DEATH, SODIUM PENTOBARBITAL		P	P							
INDUCED DEATH, CARBON DIOXIDE			P	P	P					
OBSERVATION PERIOD - P.M.										
DAY # 0										
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P
FOB PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 7										
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 14										
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P

UNAUDITED

INDIVIDUAL ANIMAL CLINICAL SIGNS - FEMALE RATS
3000.00 PPM

ANIMAL #	261	262	263	264	265	266	267	268	269	270
OBSERVATION PERIOD - A.M.										
DAY # 0										
CLINICAL EXAMINATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 1										
CLINICAL EXAMINATION, NORMAL	N	N	N	N	N	N	N	N	N	N
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 2										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 3										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 4										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 5										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 6										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 7										
FOB PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 8										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 9										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 10										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 11										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 12										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 13										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 14										
FOB PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 15										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
INDUCED DEATH, SODIUM PENTOBARBITAL										P
INDUCED DEATH, CARBON DIOXIDE						P	P	P		P
DAY # 16										
CLINICAL EXAMINATION, NORMAL	N	N	N	N	N					
INDUCED DEATH, SODIUM PENTOBARBITAL			P			P				
INDUCED DEATH, CARBON DIOXIDE	P		P	P						
OBSERVATION PERIOD - P.M.										
DAY # 0										
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P
FOB PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 7										
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 14										
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P

UNAUDITED

INDIVIDUAL ANIMAL CLINICAL SIGNS - FEMALE RATS
6000.00 PPM

ANIMAL #	271	272	273	274	275	276	277	278	279	280
OBSERVATION PERIOD - A.M.										
DAY # 0										
CLINICAL EXAMINATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 1										
CLINICAL EXAMINATION, NORMAL	N	N	N	N	N	N	N	N	N	N
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 2										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 3										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 4										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 5										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 6										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 7										
FOB PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 8										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 9										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 10										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 11										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 12										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 13										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
DAY # 14										
FOB PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 15										
CAGESIDE OBSERVATION, NORMAL	N	N	N	N	N	N	N	N	N	N
INDUCED DEATH, SODIUM PENTOBARBITAL								P		P
INDUCED DEATH, CARBON DIOXIDE						P		P		P
DAY # 16										
CLINICAL EXAMINATION, NORMAL	N	N	N	N	N					
INDUCED DEATH, SODIUM PENTOBARBITAL				P						
INDUCED DEATH, CARBON DIOXIDE	P	P		P	P					
OBSERVATION PERIOD - P.M.										
DAY # 0										
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P
FOB PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 7										
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P
DAY # 14										
MOTOR ACTIVITY PERFORMED	P	P	P	P	P	P	P	P	P	P

SUMMARY GROSS PATHOLOGY INCIDENCE TABLE - MALE RATS

GROUP	0.000 PPM	1500.000 PPM	3000.000 PPM	6000.000 PPM
BRAIN	3	3	3	3
SPINAL CORD	3	3	3	3
SCIATIC NERVE	3	3	3	3
TIBIAL NERVE	3	3	3	3
SKIN, NOS	1	0	0	0
SKIN OF ARM				
ALOPECIA	1	0	0	0

NUMBERS REPRESENT NUMBER OF TISSUES EXAMINED, OR IN THE CASE OF ABNORMAL FINDINGS, THE NUMBER OF TISSUES WITH EACH ABNORMALITY

UNAUDITED

SUMMARY GROSS PATHOLOGY INCIDENCE TABLE - FEMALES

GROUP	0.000 PPM	1500.000 PPM	3000.000 PPM	6000.000 PPM
BRAIN	3	3	3	3
MENINGES HEMORRHAGE	0	1	0	0
SPINAL CORD	3	3	3	3
MENINGES HEMORRHAGE	0	1	0	0
SCIATIC NERVE	3	3	3	3
TIBIAL NERVE	3	3	3	3
THYMUS	0	0	1	1
HEMORRHAGE	0	0	1	1

NUMBERS REPRESENT NUMBER OF TISSUES EXAMINED, OR IN THE CASE OF ABNORMAL FINDINGS, THE NUMBER OF TISSUES WITH EACH ABNORMALITY

UNAUDITED

INDIVIDUAL ANIMAL GROSS PATHOLOGY INCIDENCE TABLE - MALE RATS

0.000 PPM

ANIMAL #	201	202	203	204	205	206	207	208	209	210
DAYS ON TEST	16			16						15
BRAIN	N			N						N
SPINAL CORD	N			N						N
SCIATIC NERVE	N			N						N
TIBIAL NERVE	N			N						N
*SKIN, NOS										
SKIN OF ARM										
ALOPECIA				1						

1500.000 PPM

ANIMAL #	211	212	213	214	215	216	217	218	219	220
DAYS ON TEST	16	16						15		
BRAIN	N	N						N		
SPINAL CORD	N	N						N		
SCIATIC NERVE	N	N						N		
TIBIAL NERVE	N	N						N		

3000.000 PPM

ANIMAL #	221	222	223	224	225	226	227	228	229	230
DAYS ON TEST	16		16			15				
BRAIN	N		N			N				
SPINAL CORD	N		N			N				
SCIATIC NERVE	N		N			N				
TIBIAL NERVE	N		N			N				

6000.000 PPM

ANIMAL #	231	232	233	234	235	236	237	238	239	240
DAYS ON TEST				16			15	15		
BRAIN				N			N	N		
SPINAL CORD				N			N	N		
SCIATIC NERVE				N			N	N		
TIBIAL NERVE				N			N	N		

KEY:N-NORMAL AND TISSUE COLLECTED FOR HISTOPATHOLOGY,1-MINIMAL,2-MINOR,3-MODERATE,4-SEVERE
P-PRESENT,A-ABSENT,*-SEE COMMENT REPORT, X=NORMAL BUT NOT COLLECTED

UNAUDITED

INDIVIDUAL ANIMAL GROSS PATHOLOGY INC ENCE TABLE - FEMALE RATS

0.000 PPM

ANIMAL #	241	242	243	244	245	246	247	248	249	250
DAYS ON TEST			16	16						15
BRAIN			N	N						N
SPINAL CORD			N	N						N
SCIATIC NERVE			N	N						N
TIBIAL NERVE			N	N						N

1500.000 PPM

ANIMAL #	251	252	253	254	255	256	257	258	259	260
DAYS ON TEST	16	16				16				
*BRAIN	N	N								
MENINGES HEMORRHAGE						2				
*SPINAL CORD	N	N								
MENINGES HEMORRHAGE						2				
SCIATIC NERVE	N	N				N				
TIBIAL NERVE	N	N				N				

3000.000 PPM

ANIMAL #	261	262	263	264	265	266	267	268	269	270
DAYS ON TEST		16			16				15	
BRAIN		N			N				N	
SPINAL CORD		N			N				N	
SCIATIC NERVE		N			N				N	
TIBIAL NERVE		N			N				N	
THYMUS HEMORRHAGE		2								

6000.000 PPM

ANIMAL #	271	272	273	274	275	276	277	278	279	280
DAYS ON TEST			16				15		15	
BRAIN			N				N		N	
SPINAL CORD			N				N		N	
SCIATIC NERVE			N				N		N	
TIBIAL NERVE			N				N		N	
THYMUS HEMORRHAGE			2							

KEY:N-NORMAL AND TISSUE COLLECTED FOR HISTOPATHOLOGY,1-MINIMAL,2-MINOR,3-MODERATE,4-SEVERE
P-PRESENT,A-ABSENT,*-SEE COMMENT REPORT, X=NORMAL BUT NOT COLLECTED

UNAUDITED

GROSS PATHOLOGY COMMENT REPORT

DAY	DOSE LEVEL	ANIMAL #	COMMENT
30	0.000 PPM	204	SKIN: FOREARM - ALOPECIA
30	1500.000 PPM	256	BRAIN: SUBARACHNOID HEMORRHAGE OVER CEREBELLUM+POSTERIOR CEREBRAL HEMISPHERES.
30	1500.000 PPM	256	CERVICAL SPINAL CORD:SUBARACHNOID HEMORRHAGE OVER DORSAL PART OF SPINAL CORD.
30	1500.000 PPM	256	THORACIC SPINAL CORD:SUBARACHNOID HEMORRHAGE OVER DORSAL PART OF SPINAL CORD.

Triage of 8(e) Submissions

Date sent to triage: AUG 19 1994 NON-CAP CAP

Submission number: 13034A TSCA Inventory: Y N D

Study type (circle appropriate):

Group 1 - Dick Clements (1 copy total)

ECO AQUATO

Group 2 - Ernie Falke (1 copy total)

ATOX SBTOX SEN w/NEUR

Group 3 - Elizabeth Margosches (1 copy each)

STOX CTOX EPI RTOX GTOX

STOX/ONCO CTOX/ONCO IMMUNO CYTO NEUR

Other (FATE, EXPO, MET, etc.):

Notes:

THIS IS THE ORIGINAL 8(e) SUBMISSION; PLEASE REFILE AFTER TRIAGE DATABASE ENTRY

For Contractor Use Only

entire document: 0 1 2 **pages** 1, 2 **pages** 1, 4, 5 (2-sided)

Notes:

Contractor reviewer : DMC **Date:** 8/1

CECATS\TRIAGE TRACKING DBASE ENTRY FORM

CECATS DATA:
Submission # 8EHQ- 0594 - 13034 SEQ. A

TYPE: INT. SUPP FLWP

SUBMITTER NAME: Shell Oil Company

INFORMATION REQUESTED: FLWP DATE:
0501 NO INFO REQUESTED
0502 INFO REQUESTED (TECH)
0503 INFO REQUESTED (VOL ACTIONS)
0504 INFO REQUESTED (REPORTING RATIONALE)

DISPOSITION:
0639 REFER TO CHEMICAL SCREENING
0678 CAP NOTICE

VOLUNTARY ACTIONS:
0401 NO ACTION REPORTED
0402 STUDIES PLANNED/UNDERWAY
0403 NOTIFICATION OF WORKER/OTHERS
0404 LABEL/MSDS CHANGES
0405 PROCESS/HANDLING CHANGES
0406 APP./USE DISCONTINUED
0407 PRODUCTION DISCONTINUED
0408 CONFIDENTIAL

SUB. DATE: 05/06/94 OTS DATE: 05/17/94 CSRAD DATE: 06/16/94

CHEMICAL NAME:

CAS#
123-86-4

INFORMATION TYPE:		P F C	INFORMATION TYPE:		P F C	INFORMATION TYPE:		P F C
0201	ONCO (HUMAN)	01 02 04	0216	EPI/CLIN	01 02 04	0241	IMMUNO (ANIMAL)	01 02 04
0202	ONCO (ANIMAL)	01 02 04	0217	HUMAN EXPOS (PROD CONTAM)	01 02 04	0242	IMMUNO (HUMAN)	01 02 04
0203	CELL TRANS (IN VITRO)	01 02 04	0218	HUMAN EXPOS (ACCIDENTAL)	01 02 04	0243	CHEM/PHYS PROP	01 02 04
0204	MUTA (IN VITRO)	01 02 04	0219	HUMAN EXPOS (MONITORING)	01 02 04	0244	CLASTO (IN VITRO)	01 02 04
0205	MUTA (IN VIVO)	01 02 04	0220	ECO/AQUA TOX	01 02 04	0245	CLASTO (ANIMAL)	01 02 04
0206	REPRO/TERATO (HUMAN)	01 02 04	0221	ENV. OCCC/REL/FATE	01 02 04	0246	CLASTO (HUMAN)	01 02 04
0207	REPRO/TERATO (ANIMAL)	01 02 04	0222	EMER INCI OF ENV CONTAM	01 02 04	0247	DNA DAM/REPAIR	01 02 04
0208	NEURO (HUMAN)	01 02 04	0223	RESPONSE REQEST DELAY	01 02 04	0248	PROD/USE/PROC	01 02 04
0209	NEURO (ANIMAL)	01 02 04	0224	PROD/COMP/CHEM ID	01 02 04	0251	MSDS	01 02 04
0210	ACUTE TOX. (HUMAN)	01 02 04	0225	REPORTING RATIONALE	01 02 04	0299	OTHER	01 02 04
0211	CHR. TOX. (HUMAN)	01 02 04	0226	CONFIDENTIAL	01 02 04			
0212	ACUTE TOX. (ANIMAL)	01 02 04	0227	ALLERG (HUMAN)	01 02 04			
0213	SUB ACUTE TOX (ANIMAL)	01 02 04	0228	ALLERG (ANIMAL)	01 02 04			
0214	SUB CHRONIC TOX (ANIMAL)	01 02 04	0239	METAB/PHARMACO (ANIMAL)	01 02 04			
0215	CHRONIC TOX (ANIMAL)	01 02 04	0240	METAB/PHARMACO (HUMAN)	01 02 04			

TRIAGE DATA:

NON-CBI INVENTORY	ONGOING REVIEW	SPECIES	TOXICOLOGICAL CONCERN:	USE:	PRODUCTION:
YES (CONTINUE)	YES (DROP/REFER)	RAT	LOW Acute inhalation Toxicity		
NO (DROP)	NO (CONTINUE)		MED		
DETERMINE	REFER:		HIGH		

COMMENTS: Non-Cap

8(e)-13034A
LOW

Acute inhalation toxicity in the rat is low concern based on 0% mortality. Rats (10 sex/dose) were exposed to 1500, 3000, or 6000 ppm for 6-hours. Clinical signs during exposure included hypoactivity and decreased response to external stimulus (all doses). No treatment-related gross lesions were noted at necropsy. NOEL= 1500 ppm