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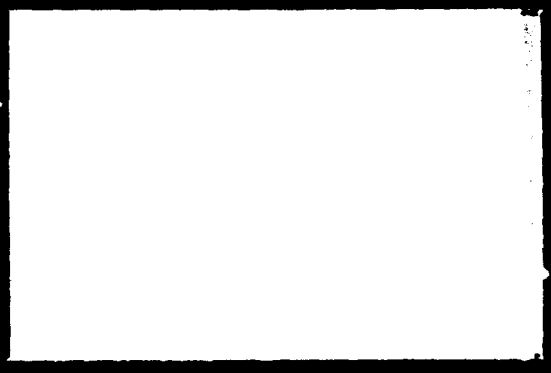

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Mammalian Toxicological Evaluation of DIMP and DCPD (Phase 3 - IMPA)

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FINAL REPORT

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By
Francis J. Mecler, Sc.D.

May 1981

Supported by
U.S. ARMY MEDICAL RESEARCH AND DEVELOPMENT COMMAND
Fort Detrick, Frederick, MD 21701

Contract No. DAMD 17-77-C-7003;

Contract Officer's Technical Representative: Dr. Jack C. Dacre
Environmental Protection Research Division
U.S. Army Medical Bioengineering Research and Development Laboratory
Fort Detrick, Frederick, Maryland 21701

Litton Bionetics, Inc.
5516 Nicholson Lane
Kensington, Maryland 20795

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REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER	2. GOVT ACCESSION NO. / 3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle): Mammalian Toxicological Evaluation of DIMP and DCPD (Phase III - IMPA)	5. TYPE OF REPORT & PERIOD COVERED: Final Report - Phase III - IMPA, DEC 76-Apr 80
	6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s): Francis J. Mecler, Sc.D.	8. CONTRACT OR GRANT NUMBER(s): DAMD17-77-C-7003
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Litton Bionetics, Inc. 5516 Nicholson Lane Kensington, MD 20795	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: 62720A.3E162720A835.AA.002
11. CONTROLLING OFFICE NAME AND ADDRESS: US Army Medical Research and Development Command Ft. Detrick, Frederick, MD 21701	12. REPORT DATE: May 1981
	13. NUMBER OF PAGES: ~~278~~
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office): US Army Medical Bioengineering Research and Development Laboratory Ft. Detrick, Frederick, MD 21701	15. SECURITY CLASS. (of this report): Unclassified
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

Approved for public release; distribution unlimited

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

IMPA	eye irritation	rats/mice/rabbits
toxicity	skin sensitization	Ames assay
acute	bacterial mutagenesis	90 day toxicity tests
oral	subchronic toxicity	
dermal		

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

IMPA had oral LD50's of 7650 and 6070 mg/kg in male and female rats, respectively, and of 5620 and 6550 mg/kg in male and female mice. It was not irritant to rabbit eyes. It was mildly irritant to rabbit skin but produced no systemic toxicity at a dose of 2 mg/kg. IMPA did not induce dermal sensitization in guinea pigs. No evidence of toxicity followed administration of IMPA in the drinking water at levels up to 3000 ppm to rats for 90 days. IMPA was not mutagenic to five strains of Salmonella indicator organisms in the Ames assay both with and without rat liver activation.

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EXECUTIVE SUMMARY

ISOPROPYL METHYLPHOSPHONIC ACID - SODIUM SALT

The oral LD50 values of sodium IMP (sodium isopropyl methylphosphonate) were calculated to be 7650 (6560-8920) and 6070 (4760-7740) mg/kg in male and female rats, respectively, and 5620 (4530-6990) and 6550 (5140-8360) mg/kg in male and female mice, respectively.

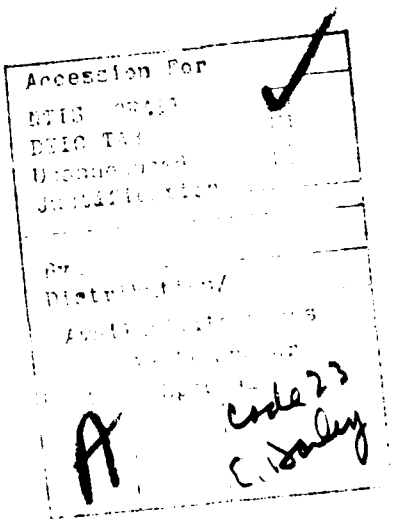
Application of sodium IMP to the intact and abraded skin of rabbits at doses of 2.0 g/kg produced no signs of systemic toxicity. Mild skin irritation was evident.

The Eye Irritation test revealed no signs of irritation in any of the rabbits' eyes which were treated with sodium IMP.

Sodium IMP did not induce dermal sensitization in the guinea pig.

After 90 days of administration of IMPA in the drinking water at levels of 300, 1000 and 3000 ppm, no changes in body weight, food intake, water intake, clinical chemistry or hematologic parameters were seen in treated rats compared to controls.

Sodium IMP did not exert a mutagenic effect in any of five strains of Salmonella indicator organisms in the Ames Assay when tested with or without rat liver activation.



FOREWORD

The studies reported herein were an addition to Contract No. DAMD 17-77-7003. Under this addition acute and subchronic toxicity testing were authorized on IMPA.

In conducting the research described in this report, the investigation(s) adhered to the "Revised 1978 Guide for the Care and Use of Laboratory Animals, U.S.H.E.W., PHS, DHEW Publication No. (NIH) 78-23".

The methods of killing animals at study terminations were intravenous overdosage of pentobarbital sodium for rabbits, inhalation of chloroform for rats, mice and guinea pigs used in acute studies and inhalation of carbon dioxide for rats used in the subchronic study.

E. Ross Hart, Ph.D. was the original Principal Investigator until his retirement in December, 1979. He was replaced by Cipriano Cueto, Jr., Ph.D. who left LBI in May, 1980. In May, 1980 Francis J. Mecler, Sc.D., became the Principal Investigator.

Citations of trade names in this report does not constitute an official Department of Army endorsement or approval of the use of such items.

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SECTION A

INTRODUCTION AND MATERIAL

ISOPROPYL METHYLPHOSPHONIC ACID

1. INTRODUCTION

The material, isopropyl methylphosphonic acid (IMPA), was submitted as the sodium salt for toxicologic evaluation. This material is a breakdown product of diisopropyl methylphosphonate (DIMP) and as such required assessment of potential toxic hazard. DIMP has been found in ground water under the Federally owned Rocky Mountain arsenal. IMPA has been identified there as well.

Assessment included determination of potential for bacterial mutagenesis, eye irritation, dermal sensitization, acute dermal toxicity, acute oral toxicity and subchronic toxicity in rats.

2. MATERIAL

The materials used in these studies were three batches of isopropyl methylphosphonic acid, sodium salt, supplied by the U.S. Army Medical Bioengineering Research and Development Laboratory. The first lot was used for all acute studies and to start the subchronic study. The other two lots were used to finish the subchronic study. For the acute studies the material was used as received but for the subchronic study the material was corrected to express the concentrations as the free acid.

The dermal sensitization study utilized Eastman 1-chloro-2,4-dinitrobenzene Lot No. F7A as a positive control. This was purchased through a scientific supply house and used as a 0.1% solution.

3. PURITY ANALYSIS

Isopropyl methylphosphonic acid was provided as the sodium salt in three batches from the US Army Medical Bioengineering Research and Development Laboratory. The laboratory's claim of 99% purity by gas chromatography esterification and titration was accepted and the white crystalline salt was used without further treatment.

SECTION B

ACUTE ORAL TOXICITY STUDY IN RATS

ISOPROPYL METHYLPHOSPHONIC ACID

LBI PROJECT NO. 10734-12

SUMMARY

The oral LD50 values of the test material, IMPA, were 7650 and 6070 mg/kg for male and female rats, respectively.

1. OBJECTIVE

The objective of this study was to evaluate the acute toxicity of the test compound when administered by oral gavage to male and female rats.

2. MATERIAL

Two glass jars (550 g each) containing a white powder and labeled:

Isopropyl Methylphosphonic Acid, Sodium Salt
Batch 1 #127818

were received from U. S. Army Medical Research and Development Command by Litton Bionetics, Inc. (LBI), on December 18, 1978, and designated as LBI No. 3427.

3. EXPERIMENTAL DESIGN

Young adult rats (weighing 187 to 293 g and 56 to 67 days of age at the time of treatment, February 21, 1979) of the Charles River CD strain [CRL:COBS CD (SD) BR] were obtained from the Charles River Breeding Laboratories, Inc., Portage, Michigan. The animals were acclimated to laboratory conditions for seven days in the Rockville facility of the Department of Toxicology. The animals were individually housed in wire-bottom cages in temperature-controlled quarters under artificial illumination controlled to provide a 12-hour light cycle. Water and Purina Laboratory Chow were provided ad libitum with the exception of the night before treatment when food was removed from the cages.

The test material as the salt, was dissolved in deionized water at concentrations of 250 or 500 mg/ml. Single graded doses of the test material were administered by oral gavage to five rats of each sex at each of four dose levels.

3. EXPERIMENTAL DESIGN (Continued)

The rats were observed frequently on the day of treatment and daily thereafter. The animals were weighed on the day of treatment, and on Days 7 and 14 following treatment. Necropsies were performed on all animals that died during the study and on the surviving animals that were killed 14 days after treatment.

4. RESULTS

The data have been summarized as follows below.

Dose (mg/kg)	Mean Body Weight (g) Day 0	7	14	Deaths Day 0	1	2	3	4	5-14	Total Mortality Deaths/Treated
				Males						
4640	271	321	352							0/5
6810	235	282	320		1					1/5
10000	257	-	-		5					5/5
14700	286	-	-		5					5/5
				Females						
3160	206	231	244							0/5
4640	211	241	248					1		1/5
6810	195	239	238		3					3/5
10000	203	-	-		5					5/5

Based on the deaths occurring in the 14 days after treatment, and using a modification of the method of Horn (Biometrics, V. 12, p. 311, 1956), LD50 values of 7650 mg/kg (95% confidence limits: 6560-8920) and 6070 mg/kg (95% confidence limits: 4760-7740) for male and female rats, respectively, were calculated.

Signs of toxicity included loose or liquid stool in several animals at all dose levels. Reduced motor activity and prostration were observed in some animals at doses greater than 3160 mg/kg. Ataxia was seen in one male at the 10,000 mg/kg dose level, one female at the 10,000 and 4640 mg/kg levels, and three females at the 6810 mg/kg dose level. Additional observations consisted of an opaque eye in one male at the 6810 mg/kg level, abnormal breathing sounds in one female at the 10,000 mg/kg level, and tremors in one female at the 4640 mg/kg dose level.

4. RESULTS (Continued)

No abnormal necropsy findings were observed in any of the survivors. Among rats that died, red or mottled lungs in some of the males at the 10,000 and 14,700 mg/kg levels and some females at the 6810 mg/kg level and one female at the 10,000 and 4640 mg/kg levels were noted. Distended, fluid-filled stomachs and intestines were observed in all animals found dead. In addition some of the stomach linings were red. Dark spots on the thymus were seen in females at 6810 and 10,000 mg/kg levels and males at the 10,000 and 14,700 mg/kg levels.

Thirty days after transmittal of this report, original data and a copy of the final report will be transferred to the LBI Archivist, 5516 Nicholson Lane, Kensington, Maryland, for distribution to the proper repositories. A copy of this report and underlying data were reviewed by the LBI Quality Assurance Unit.

5. CONCLUSION

Following the oral administration of graded doses of the test compound to fasted young adult rats, LD50 values of 7650 and 6070 mg/kg were calculated for male and female rats, respectively. The central nervous system and gastrointestinal tract may be possible sites of toxicity.

Submitted by:

David R. Damske, B.A.
Technical Group Leader
Department of Toxicology

Francis J. Mecler — Date
Senior Toxicologist
Department of Toxicology

Reviewed by:

E. Ross Hart, Ph.D. — Date
Principal Investigator

SECTION C

ACUTE ORAL TOXICITY STUDY IN MICE

ISOPROPYL METHYLPHOSPHONIC ACID

LBI PROJECT NO. 10734-13

SUMMARY

The oral LD50 values of the test material, IMPA, were 5620 and 6550 mg/kg for male and female mice, respectively.

1. OBJECTIVE

The objective of this study was to evaluate the acute toxicity of the test material when administered by oral gavage to male and female mice.

2. MATERIAL

Two glass jars (550 g each) containing a white powder and labeled:

Isopropyl Methylphosphonic Acid, Sodium Salt
Batch 1 #127818

were received from U. S. Army Medical Research and Development Command by Litton Bionetics, Inc. (LBI) on December 18, 1978, and designated as LBI No. 3427.

3. EXPERIMENTAL DESIGN

Young adult mice (weighing 24 to 38 g and nine weeks of age at the time of treatment, February 6, 1979) of the Charles River CD-1 strain were obtained from the Charles River Breeding Laboratories, Inc., Portage, Michigan. The mice were acclimated to laboratory conditions for 13 days in the Rockville facility of the Department of Toxicology. The animals were individually housed in wire-bottom cages in temperature-controlled quarters under artificial illumination controlled to provide a 12-hour light cycle. Acidified water (pH 2.5) and Purina Laboratory Chow were provided ad libitum with the exception of the night before treatment when food was removed from the cages.

The test material as a salt, was dissolved in deionized water at a concentration of 500 mg/ml at 10,000 and 6810 mg/kg, and 250 mg/ml at 4640 and 3160 mg/kg dose levels. Single graded doses of the test material were administered by oral gavage to five mice of each sex at each of four dose levels.

3. EXPERIMENTAL DESIGN (Continued)

The mice were observed frequently on the day of treatment and daily thereafter. The animals were weighed on the day of treatment, and on Days 7 and 14 following treatment. Necropsies were performed on all animals that died during the study and on the surviving animals that were killed 14 days after treatment.

4. RESULTS

The data have been summarized below.

Dose (mg/kg)	Mean Body Weight (g) Day 0	7	14	Deaths Day 0	1	2	3	4-14	Total Mortality Deaths/Treated
			Males						
3160	31	36	35						0/5
4640	31	37	38		1				1/5
6810	34	37	39		3	1			4/5
10000	29	-	-		5				5/5
			Females						
3160	26	31	32						0/5
4640	27	32	32				1		1/5
6810	27	33	33		2				2/5
10000	28	-	-		5				5/5

Based on the deaths occurring in the 14 days after treatment, and using a modification of the method of Horn (Biometrics, V. 12, p. 311, 1956), LD50 values of 5620 mg/kg (95% confidence limits: 4530-6990) and 6550 mg/kg (95% confidence limits: 5140-8360) for male and female mice, respectively, were calculated.

Signs of toxicity included soft or liquid stool in some mice at all dose levels, except the 3160 mg/kg female mice. Reduced motor activity and ataxia were observed in some mice at dose levels greater than 3160 mg/kg , with all male mice at the 6810 mg/kg level affected and all mice at the 10,000 mg/kg level which were alive at the one hour observation interval. Prostration was observed in one female at the 6810 mg/kg level and two males and one female at the 10,000 mg/kg level.

4. RESULTS (Continued)

No abnormal necropsy findings were observed in any of the mice surviving for 14 days. Among mice that died, fluid-filled stomach and intestines were observed in all animals. Mottled or congested lungs were observed in three females at the 10,000 mg/kg level and dark red areas on the lungs of one female at the 4640 mg/kg dose level were observed.

Thirty days after transmittal of this report, original data from the Department of Toxicology will be transferred to the LBI Archivist, 5516 Nicholson Lane, Kensington, Maryland, for distribution to the proper repositories. A copy of this report was reviewed by the LBI Quality Assurance Unit.

5. CONCLUSION

Following the oral administration of graded doses of the test material to fasted young adult mice, LD50 values of 5620 and 6550 mg/kg were calculated for male and female mice, respectively. The nervous system and gastrointestinal tract may be possible sites of toxicity.

Submitted by:

David R. Damske, B.A.
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Francis J. Mecler — 3-14-79
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Reviewed by:

Robert P. Beliles — 3/16/79
Robert P. Beliles, Ph.D.
Director
Department of Toxicology
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SECTION D

ACUTE DERMAL TOXICITY STUDY IN RABBITS

ISOPROPYL METHYLPHOSPHONIC ACID

LBI PROJECT NO. 10734-10

SUMMARY

Following the dermal application of 2.0 g/kg of the test material to young adult female rabbits, no deaths or signs of systemic toxicity were observed. The dermal LD50 was estimated to be greater than 2.0 g/kg.

1. OBJECTIVE

The objective of this study was to evaluate the acute systemic toxicity and the potential for skin irritation of the test material following a single dermal application to six rabbits.

2. MATERIAL

Two glass jars (550 g each) containing a white powder and labeled:

Isopropyl Methylphosphonic Acid, Sodium Salt
Batch 1 #127818

were received from U. S. Army Medical Research and Development Command by Litton Bionetics, Inc. (LBI) on December 18, 1978, and designated as LBI No. 3427.

3. EXPERIMENTAL DESIGN

Young adult female New Zealand White (albino) rabbits (weighing 2.5 to 3.0 kg and 14 weeks of age) were obtained from R and H Rabbitry, Rockville, Maryland. The animals were acclimated to laboratory conditions for 15 days in the Rockville facility of the Department of Toxicology. The animals were individually housed in wire-bottom cages in temperature-controlled quarters under artificial illumination controlled to provide a 12-hour light cycle. Water and Purina Rabbit Chow were provided ad libitum.

Six rabbits were prepared by clipping the skin of the trunk free of hair 24 hours prior to test material application. Three rabbits were further prepared by making epidermal abrasions every 2-3 cm longitudinally over the areas to be exposed. The abrasions were sufficiently deep to penetrate the stratum corneum, but not to disturb the derma. A single 2.0 g/kg dose of the test material was applied to the skin of the rabbits beginning February 6, 1979.

3. EXPERIMENTAL DESIGN (Continued)

After application, the site was covered with gauze and Saran wrap, and the rabbits were placed in restraining collars for 24 hours. At the end of 24 hours, the Saran wrap and collars were removed. The gauze pad was then weighed to determine the amount of unabsorbed test material. The subjects were cleaned by thorough wiping and observed daily for gross signs of poisoning and skin reactions for two weeks after testing. Body weights were obtained initially, and at 7 and 14 days after treatment. The evaluation of skin reactions was based on the following scoring system. All animals surviving 14 days after treatment were necropsied and any changes in the internal organs noted.

Erythema and Eschar Formation

No erythema	0
Very slight erythema (barely perceptible)	1
Well defined erythema	2
Moderate to severe erythema	3
Severe erythema (beet redness) to slight eschar formation (injuries in depth)	4
Total possible erythema score	4

Edema Formation

No edema	0
Very slight edema (barely perceptible)	1
Slight edema (edges of area well defined by definite raising)	2
Moderate edema (raised approximately 1 mm)	3
Severe edema (raised more than 1 mm and extending beyond area of exposure)	4
Total possible edema score	4

4. RESULTS

The results of the data have been summarized on page 3. On an average, 35% of the applied dose was unabsorbed and remained on the skin and gauze pad after the Saran wrap was removed.

4. RESULTS (Continued)

Rabbit Number	Dose (g/kg)	Skin	Body Weights (kg) Day 0	7	14
5204	2.0	Intact	2.7	3.0	3.1
5205	2.0	Intact	2.7	3.1	3.4
5206	2.0	Intact	2.6	3.0	3.0
5207	2.0	Abraded	2.6	2.9	2.8
5208	2.0	Abraded	2.5	3.1	3.4
5209	2.0	Abraded	3.0	3.2	3.5

Based on the absence of deaths occurring in the 14 days after treatment, the LD50 value was estimated to be greater than 2 g/kg for female rabbits.

Both the intact and abraded rabbits showed very slight to well-defined erythema for one to five days after treatment. Observations included one rabbit with a swollen left eyelid and a white discharge from the left eye, and one rabbit had hair loss at the mid-dorsal cervical region. Observations at necropsy revealed no visible abnormalities.

Thirty days after transmittal of this report, original data from the Department of Toxicology will be transferred to the LBI Archivist, 5516 Nicholson Lane, Kensington, Maryland, for distribution to the proper repositories. A copy of this report was reviewed by the LBI Quality Assurance Unit.

5. CONCLUSION

Following the dermal application of 2.0 g/kg of the test material to young adult female rabbits, no mortalities or signs of systemic toxicity were observed. The dermal LD50 was estimated to be greater than 2.0 g/kg and the dermal response was judged to suggest a mild potential for skin irritation.

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3-14-79
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Reviewed by:

Robert P. Beliles, Ph.D.
Director
Department of Toxicology

3/16/79
Date

SECTION E

PRIMARY EYE IRRITATION AND CORROSIVENESS STUDY IN RABBITS

ISOPROPYL METHYLPHOSPHONIC ACID

LBI PROJECT NO. 10734-11

SUMMARY

The test material, IMPA, was instilled (100 mg) into the eyes of albino rabbits. The eyes were examined at 1, 24, 48 and 72 hours, and at 4 and 7 days after treatment. Based on the scoring system used, the test material was judged not to be irritating to the eye.

1. OBJECTIVE

The objective of this study was to investigate the possibility that direct contamination of the eye with the test material would be followed by irritation and/or injury.

2. MATERIAL

Two glass jars (550 g each) containing a white powder and labeled:

Isopropyl Methylphosphonic Acid, Sodium Salt
Batch 1 #127818

were received from U. S. Army Medical Research and Development Command by Litton Bionetics, Inc. (LBI) on December 18, 1978, and designated as LBI No. 3427.

3. EXPERIMENTAL DESIGN

Six female New Zealand White (albino) rabbits were obtained from B and H Rabbitry, Rockville, Maryland. The animals were acclimated to laboratory conditions for 14 days in the Rockville facility of the Department of Toxicology. The rabbits weighed 2.3 to 2.8 kg at the time of treatment, February 5, 1979. The rabbits were individually housed in wire-bottom cages in temperature-controlled quarters under artificial illumination controlled to provide a 12-hour light cycle. Water and Purina Rabbit Chow were provided ad libitum.

The eyes of the rabbits were examined with the aid of 2% sodium fluorescein before testing to ensure that the eyes were without defects or irritation. The animals were firmly held and 100 mg of the test material was instilled into one eye of each rabbit. The eyes were examined and graded according to the table on page 2. The scores were recorded at 1, 24, 48 and 72 hours, and at 4 and 7 days.

3. EXPERIMENTAL DESIGN (Continued)

CORNEA	GRADE
No ulceration or opacity	0
Scattered or diffuse areas of opacity, details of iris clearly visible	1[1]
Easily discernible translucent areas of opacity, details of iris slightly obscured	2[1,2]
Nacreous areas of opacity, no details of iris visible, size of pupil barely discernible	3[1,2]
Complete corneal opacity, iris not discernible	4[1,2]
Ulceration, absence of a gross patch of corneal epithelium	4[2]

IRIS	
Normal	0
Markedly deepened folds, congestion, swelling, moderate circumcorneal injection (any of these or combination of any thereof), iris still reacting to light (sluggish reaction is positive)	1[1]
No reaction to light, hemorrhage, gross destruction (any or all of these)	2[1]

CONJUNCTIVAE

Redness (refers to palpebral and bulbar conjunctivae excluding cornea and iris):

Vessels normal	0
Some vessels definitely injected	1
Diffuse, crimson red, individual vessels not easily discernible	2[1]
Diffuse beefy red	3[1]

Chemosis:

No swelling	0
Any swelling above normal (includes nictitating membrane)	1
Obvious swelling with partial eversion of lids	2[1]
Swelling with lids about half closed	3[1]
Swelling with lids more than half closed	4[1]
Ulceration or necrosis of palpebral and bulbar conjunctivae or nictitating membrane	4[2]

[1]Grades considered positive for irritation.
[2]Grades considered positive for corrosiveness. In addition, grade 1 opacity evident for any 6 or more days will also be considered as corrosive.

4. RESULTS

The detailed results of the ocular changes in the treated eyes of each rabbit have been included in the Appendix. No changes were observed in the untreated eyes. No ocular changes were observed in five of the six treated rabbits. One rabbit was observed to show a Grade 1 reaction at the 24 hour observation interval for the iris and redness of the conjunctivae.

Thirty days after transmittal of this report, original data from the Department of Toxicology will be transferred to the LBI Archivist, 5516 Nicholson Lane, Kensington, Maryland, for distribution to the proper repositories. A copy of this report was reviewed by the LBI Quality Assurance Unit.

5. CONCLUSION

The test material, IMPA, was judged to be non-irritating when instilled into the eyes of rabbits.

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Date

TABLE E-1
LITTON BIONETICS, INC.
PROJECT NO. 10734-11

SCORING FOR EYE IRRITATION

RABBIT NUMBER: 5198D EYE TREATED: RIGHT

	TIME OF OBSERVATION AFTER TREATMENT					
	HOURS				DAY	
	1	24	48	72	4	7
CORNEA	0	0	0	0	0	0
IRIS	0	1	0	0	0	0
CONJUNCTIVAE						
A. REDNESS	0	1	0	0	0	0
B. CHEMOSIS	0	0	0	0	0	0

RABBIT NUMBER: 5199D EYE TREATED: LEFT

	TIME OF OBSERVATION AFTER TREATMENT					
	HOURS				DAY	
	1	24	48	72	4	7
CORNEA	0	0	0	0	0	0
IRIS	0	0	0	0	0	0
CONJUNCTIVAE						
A. REDNESS	0	0	0	0	0	0
B. CHEMOSIS	0	0	0	0	0	0

TABLE E-1 (CONTINUED)
LITTON BIONETICS, INC.
PROJECT NO. 10734-11

SCORING FOR EYE IRRITATION

RABBIT NUMBER: 5200D EYE TREATED: RIGHT

	TIME OF OBSERVATION AFTER TREATMENT					
	HOURS				DAY	
	1	24	48	72	4	7
CORNEA	0	0	0	0	0	0
IRIS	0	0	0	0	0	0
CONJUNCTIVAE						
A. REDNESS	0	0	0	0	0	0
B. CHEMOSIS	0	0	0	0	0	0

RABBIT NUMBER: 5201D EYE TREATED: LEFT

	TIME OF OBSERVATION AFTER TREATMENT					
	HOURS				DAY	
	1	24	48	72	4	7
CORNEA	0	0	0	0	0	0
IRIS	0	0	0	0	0	0
CONJUNCTIVAE						
A. REDNESS	0	0	0	0	0	0
B. CHEMOSIS	0	0	0	0	0	0

TABLE E-1 (CONTINUED)
LITTON BIONETICS, INC.
PROJECT NO. 10734-11

SCORING FOR EYE IRRITATION

RABBIT NUMBER: 5202D EYE TREATED: RIGHT

	TIME OF OBSERVATION AFTER TREATMENT					
	HOURS				DAY	
	1	24	48	72	4	7
CORNEA	0	0	0	0	0	0
IRIS	0	0	0	0	0	0
CONJUNCTIVAE						
A. REDNESS	0	0	0	0	0	0
B. CHEMOSIS	0	0	0	0	0	0

RABBIT NUMBER: 5203D EYE TREATED: LEFT

	TIME OF OBSERVATION AFTER TREATMENT					
	HOURS				DAY	
	1	24	48	72	4	7
CORNEA	0	0	0	0	0	0
IRIS	0	0	0	0	0	0
CONJUNCTIVAE						
A. REDNESS	0	0	0	0	0	0
B. CHEMOSIS	0	0	0	0	0	0

SECTION F

GUINEA PIG SENSITIZATION STUDY

ISOPROPYL METHYLPHOSPHONIC ACID

LBI PROJECT NO. 10734-14

SUMMARY

Guinea pigs were injected intradermally with a 0.1% solution of the test material in ten 0.1 ml injections over a course of three weeks in an attempt to induce sensitization. Two weeks after the last injection a challenge injection of 0.1 ml was made. Based on the observations of the reaction to the challenge injection, the test material was judged to have no potential to induce sensitization in the guinea pig.

1. OBJECTIVE

The objective of this study was to evaluate the potential of the test material to cause skin sensitization in guinea pigs.

2. MATERIAL

Two glass jars (550 g each) containing a white powder and labeled:

Isopropyl Methylphosphonic Acid, Sodium Salt
Batch 1 #127818

were received from U. S. Army Medical Research and Development Command by Litton Bionetics, Inc. (LBI), on December 18, 1978, and designated as LBI No. 3427.

A brown jar (100 g) containing an amber crystalline material and labeled:

Eastman 1-chloro-2,4-dinitrobenzene
Lot No. F7A

was purchased from Scientific Products by Litton Bionetics, Inc. (LBI), and designated as LBI No. 3720.

3. EXPERIMENTAL DESIGN

Thirteen female guinea pigs (weighing 302 to 445 g at the time of treatment, February 7, 1979) of the Hartley strain were obtained from Charles River Breeding Laboratories, Inc., Kingston, New York. The animals were acclimated to laboratory conditions for 14 days in the Rockville facility of the Department of Toxicology. The animals were individually housed in wire-bottom cages in temperature-controlled quarters under artificial illumination controlled to provide a 12-hour light cycle. Water and Purina Guinea Pig Chow were provided *ad libitum*.

3. EXPERIMENTAL DESIGN (Continued)

One flank of each animal was shaved 24 hours prior to treatment. The animals were divided into two groups. Group 1, consisting of four guinea pigs, received 2,4-dinitro-1-chlorobenzene 0.1% as a positive control. Group 2, consisting of nine guinea pigs, received 0.1 ml of a 0.1% solution of the test material in normal saline. The test solutions were injected intradermally into the shaved flank, three times per week (Monday, Wednesday and Friday) for 10 injections. Fifteen days after the tenth injection, a challenge injection was made to a site below the sensitization site.

At each sensitizing injection an evaluation of the reaction from the previous injection was made. The site of the challenge injection was evaluated 24 and 48 hours after the challenge. The evaluation of the reaction sites included measurement of reaction diameters with calipers and estimation of height of reaction. Color of the reaction site was noted. The guinea pigs were observed daily for mortality.

4. RESULTS

The results of the individual observations have been detailed in Appendix Table F-2.

Observations of the test group guinea pigs' reactions revealed no reaction during the sensitizing period. Very slight reactions consisting of very mild erythema and very slight edema were observed 24 hours after the challenge injection. Two guinea pigs were found dead prior to completion of dosing but these deaths were not considered to be related to test material administration. Observations of the positive control guinea pigs' reactions revealed redness and swelling after the fourth sensitizing injection with the degree of redness and diameter of the reaction increasing with subsequent injections. The response to the challenge injection was greater than the average sensitization reaction. Based on the reaction of the guinea pigs to the challenge injection of the test material, the test material was judged to have no potential to cause skin sensitization in the guinea pig.

Thirty days after transmittal of this report, original data and a copy of the final report will be transferred to the LBI Archivist, 5516 Nicholson Lane, Kensington, Maryland, for distribution to the proper repositories. A copy of this report and underlying data were reviewed by the LBI Quality Assurance Unit.

5. CONCLUSION

Guinea pigs were injected intradermally with a 0.1% solution of the test material in ten 0.1 ml injections over a course of three weeks in an attempt to induce sensitization. Two weeks after the last injection, a challenge injection was made. Based on the observations of the reaction to the challenge injection, the test material was judged to have no potential to induce sensitization in the guinea pig.

Submitted by:

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Technical Group Leader
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Francis J. Mecler 4-19-79
Francis J. Mecler Date
Senior Toxicologist
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Reviewed by:

E. Ross Hart, Ph.D. Date
Principal Investigator

LITTON BIONETICS, INC.
PROJECT NO. 10734-14

TABLE F-2

OBSERVATIONS

ANIMAL NUMBER: 5439 POSITIVE CONTROL

DOSE (ML)	DATE	OBSERVATIONS DIAMETER (MM)	HEIGHT (MM)	COLOR
0.1	2-09-79	3x3	1	0
	2-12-79	3x4	2	0
	2-14-79	3x10	2	0
	2-16-79	4x15	0	SLIGHT RED
	2-19-79	8x11	0	SEVERE RED
	2-21-79	5x10	2	SEVERE RED
	2-23-79	5x10	3	SEVERE RED
	2-26-79	6x6	2	SEVERE RED
	2-28-79	7x6	2	SEVERE RED
CHALLENGE DOSE				
0.1	3-16-79	6x6	2	SEVERE RED
	3-17-79	8x5	2	SEVERE RED

ANIMAL NUMBER: 5440 POSITIVE CONTROL

DOSE (ML)	DATE	OBSERVATIONS DIAMETER (MM)	HEIGHT (MM)	COLOR
0.1	2-09-79	2x2	0	0
	2-12-79	0	0	0
	2-14-79	3x10	0	0
	2-16-79	7x10	1	SLIGHT RED
	2-19-79	15x8	1	0
	2-21-79	15x8	1	SLIGHT RED
	2-23-79	8x18	1	SLIGHT RED
	2-26-79	10x3	1	SLIGHT RED
	2-28-79	7x10	1	SEVERE RED
CHALLENGE DOSE				
0.1	3-16-79	7x7	2	RED
	3-17-79	7x6	2	RED

LITTON BIONETICS, INC.
PROJECT NO. 10734-14

TABLE F-2 (CONTINUED)

OBSERVATIONS

ANIMAL NUMBER: 5441 POSITIVE CONTROL

DOSE (ML)	DATE	OBSERVATIONS DIAMETER (MM)	HEIGHT (MM)	COLOR
0.1	2-09-79	1x1	1	SLIGHT RED
	2-12-79	1x1	1	SLIGHT RED
	2-14-79	3x9	1	SLIGHT RED
	2-16-79	10x10	2	SLIGHT RED
	2-19-79	10x10	1	0
	2-21-79	10x10	2	SLIGHT RED
	2-23-79	10x12	2	SEVERE RED
	2-26-79	10x6	1	SEVERE RED
	2-28-79	10x7	1	SEVERE RED
CHALLENGE DOSE				
0.1	3-16-79	8x6	2	MODERATE RED
	3-17-79	7x7	2	MODERATE RED

ANIMAL NUMBER: 5442 POSITIVE CONTROL

DOSE (ML)	DATE	OBSERVATIONS DIAMETER (MM)	HEIGHT (MM)	COLOR
0.1	2-09-79	0	0	0
	2-12-79	3x2	1	0
	2-14-79	3x8	1	0
	2-16-79	5x8	2	SLIGHT RED
	2-19-79	5x17	1	0
	2-21-79	7x12	1	SLIGHT RED
	2-23-79	5x10	1	SLIGHT RED
	2-26-79	5x10	1	SLIGHT RED
	2-28-79	5x12	2	SLIGHT RED
CHALLENGE DOSE				
0.1	3-16-79	7x7	2	MODERATE RED
	3-17-79	7x7	2	RED

LITTON BIONETICS, INC.
PROJECT NO. 10734-14

TABLE F-2 (CONTINUED)

OBSERVATIONS

ANIMAL NUMBER: 5443 IMPA

DOSE (ML)	DATE	OBSERVATIONS DIAMETER (MM)	HEIGHT (MM)	COLOR
0.1	2-09-79	0	0	0
	2-12-79	0	0	0
	2-14-79	0	0	0
	2-16-79	0	0	0
	2-19-79	0	0	0
	2-21-79	0	0	0
	2-23-79	0	0	0
	2-26-79	0	0	0
	2-28-79	0	0	0
CHALLENGE DOSE				
0.1	3-16-79	2x2	1	SLIGHT RED
	3-17-79	0	0	0

ANIMAL NUMBER: 5444 IMPA

DOSE (ML)	DATE	OBSERVATIONS DIAMETER (MM)	HEIGHT (MM)	COLOR
0.1	2-09-79	0	0	0
	2-12-79	0	0	0
	2-14-79	0	0	0
	2-16-79	0	0	0
	2-19-79	0	0	0
	2-21-79	0	0	0
	2-23-79	0	0	0
	2-26-79	a		

[a]Found dead.

LITTON BIONETICS, INC.
PROJECT NO. 10734-14

TABLE F-2 (CONTINUED)

OBSERVATIONS

ANIMAL NUMBER: 5445 IMPA

DOSE (ML)	DATE	OBSERVATIONS DIAMETER (MM)	HEIGHT (MM)	COLOR
0.1	2-09-79	0	0	0
	2-12-79	0	0	0
	2-14-79	0	0	0
	2-16-79	0	0	0
	2-19-79	0	0	0
	2-21-79	0	0	0
	2-23-79	0	0	0
	2-26-79	0	0	0
	2-28-79	0	0	0
CHALLENGE DOSE				
0.1	3-16-79	4x3	1	WELL DEFINED RED
	3-17-79	4x3	0	SLIGHT RED

ANIMAL NUMBER: 5446 IMPA

DOSE (ML)	DATE	OBSERVATIONS DIAMETER (MM)	HEIGHT (MM)	COLOR
0.1	2-09-79	0	0	0
	2-12-79	0	0	0
	2-14-79	0	0	0
	2-16-79	0	0	0
	2-19-79	0	0	0
	2-21-79	0	0	0
	2-23-79	0	0	0
	2-26-79	0	0	0
	2-28-79	0	0	0
CHALLENGE DOSE				
0.1	3-16-79	0	0	0
	3-17-79	0	0	0

LITTON BIONETICS, INC.
PROJECT NO. 10734-14

TABLE F-2 (CONTINUED)

OBSERVATIONS

ANIMAL NUMBER: 5447 IMPA

DOSE (ML)	DATE	OBSERVATIONS DIAMETER (MM)	HEIGHT (MM)	COLOR
0.1	2-09-79	0	0	0
	2-12-79	0	0	0
	2-14-79	0	0	0
	2-16-79	0	0	0
	2-19-79	0	0	0
	2-21-79	0	0	0
	2-23-79	0	0	0
	2-26-79	0	0	0
	2-28-79	0	0	0
CHALLENGE DOSE				
0.1	3-16-79	2x2	0	SLIGHT RED
	3-17-79	0	0	0

ANIMAL NUMBER: 5448 IMPA

DOSE (ML)	DATE	OBSERVATIONS DIAMETER (MM)	HEIGHT (MM)	COLOR
0.1	2-09-79	0	0	0
	2-12-79	0	0	0
	2-14-79	0	0	0
	2-16-79	0	0	0
	2-19-79	0	0	0
	2-21-79	0	0	0
	2-23-79	0	0	0
	2-26-79	0	0	0
	2-28-79	0	0	0
CHALLENGE DOSE				
0.1	3-16-79	1x2	0	SLIGHT RED
	3-17-79	0	0	0

LITTON BIONETICS, INC.
PROJECT NO. 10734-14

TABLE F-2 (CONTINUED)

OBSERVATIONS

ANIMAL NUMBER: 5449 IMPA

DOSE (ML)	DATE	OBSERVATIONS DIAMETER (MM)	HEIGHT (MM)	COLOR
0.1	2-09-79	0	0	0
	2-12-79	0	0	0
	2-14-79	0	0	0
	2-16-79	0	0	0
	2-19-79	0	0	0
	2-21-79	0	0	0
	2-23-79	0	0	0
	2-26-79	0	0	0
	2-28-79	0	0	0
CHALLENGE DOSE				
0.1	3-16-79	4x4	1	SLIGHT RED
	3-17-79	0	0	0

ANIMAL NUMBER: 5450 IMPA

DOSE (ML)	DATE	OBSERVATIONS DIAMETER (MM)	HEIGHT (MM)	COLOR
0.1	2-09-79	0	0	0
	2-12-79	0	0	0
	2-14-79	0	0	0
	2-16-79	0	0	0
	2-19-79	0	0	0
	2-21-79	0	0	0
	2-23-79	0	0	0
	2-26-79	0	0	0
	2-28-79	0	0	0
CHALLENGE DOSE				
0.1	3-16-79	8x5	1	SLIGHT RED
	3-17-79	0	0	0

LITTON BIONETICS, INC.
PROJECT NO. 10734-14

TABLE F-2 (CONTINUED)

OBSERVATIONS

ANIMAL NUMBER: 5451 IMPA

DOSE (ML)	DATE	OBSERVATIONS DIAMETER (MM)	HEIGHT (MM)	COLOR
0.1	2-12-79	0	0	0
	2-14-79	0	0	0
	2-16-79	0	0	0
	2-19-79	0	0	0
	2-21-79	0	0	0
	2-23-79	0	0	0
	2-26-79	0	0	0
	2-28-79	0	0	0
	3-02-79	0	0	0
	3-05-79	a		

[a]Found dead.

SECTION G

MICROBIAL MUTAGENESIS

ISOPROPYL METHYLPHOSPHONIC ACID

LBI PROJECT NO. 10734

I. SPONSOR: U.S. Army

II. MATERIAL

A. Identification: IMPA-isopropyl methylphosphonic acid, Sodium Salt

B. Date Received: January 22, 1979

C. Physical Description: White fluffy powder

III. TYPE OF ASSAY: Ames Salmonella/Microsome Plate Test

IV. PROTOCOL NO.: OMT-100

V. RESULTS

The results of this assay are presented in Tables G-3 and G-4.

VI. INTERPRETATION OF RESULTS AND CONCLUSIONS

The test compound was examined for mutagenic activity in a series of in vitro microbial assays employing Salmonella indicator organisms. The compound was tested directly and in the presence of liver microsomal enzyme preparations from Aroclor-induced rats.

The compound was tested over a series of concentrations such that there was either quantitative or qualitative evidence of some chemically-induced physiological effects at the high dose level. The low dose in all cases was below a concentration that demonstrated any toxic effect. The dose range employed for the evaluation of this compound was from 1.0 µg to 1000 µg per plate.

The test compound did not exhibit toxicity in the initial test; therefore, a repeat test was conducted at additional doses of 2500 µg and 5000 µg per plate with the strains TA-1537, TA-98 and TA-100. Slight toxicity was observed at 5000 µg per plate with the strain TA-1537.

The results of the tests conducted on the compound in the absence of a metabolic activation system were all negative. The test was repeated with TA-1537 and TA-1538 because of low solvent control values for TA-1538 and because of the overall increased number of revertants over the solvent controls with TA-1537. The repeat tests were also negative.

VI. INTERPRETATION OF RESULTS AND CONCLUSIONS (Continued)

The results of the tests conducted on the compound in the presence of a rat liver activation system were all negative.

The test compound IMPA-ISOPROPYL METHYLPHOSPHONIC ACID, Sodium Salt did not demonstrate genetic activity in any of the assays conducted in this evaluation and was considered not mutagenic under these test conditions.

Submitted by:

Study Director

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Reviewed by:

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TABULATION OF REVERTANTS IN AMES ASSAY USING SODIUM ISOPROPYL METHYLPHOSPHONATE WITH AND WITHOUT ACTIVATION

V. RESULTS TABLE G-3

A. NAME OR CODE DESIGNATION OF THE TEST COMPOUND: IMPA-ISOPROPYL METHYLPHOSPHONIC ACID, SODIUM SALT
B. SOLVENT: DISTILLED WATER
C. TEST INITIATION DATE: 01/31/79
NOTE: CONCENTRATIONS ARE GIVEN IN MICROLITERS (UL) OR MICROGRAMS (UG) PER PLATE.

TEST	SPECIES	TISSUE	REVERTANTS PER PLATE TA-1535		TA-1537		TA-1538		TA-98		TA-100	
			1	2	1	2	1	2	1	2	1	2
NONACTIVATION												
SOLVENT CONTROL	---	---	24		6	11	4	15	29		167	
POSITIVE CONTROL**	---	---	1635		451	441	860	878	1124		1525	
TEST COMPOUND												
0.500000 UG	---	---	22		16	10	9	16	25		135	
1.000000 UG	---	---	18		16	8	7	21	24		151	
10.000000 UG	---	---	14		20	11	1	19	20		157	
100.000000 UG	---	---	12		19	16	8	18	28		170	
500.000000 UG	---	---	17		29	11	17	18	32		137	
1000.000000 UG	---	---	15		16	9	13	12	22		170	
ACTIVATION												
SOLVENT CONTROL	RAT	LIVER	22		13		15		40		155	
POSITIVE CONTROL***	RAT	LIVER	734		84		2552		3454		2334	
TEST COMPOUND												
0.500000 UG	RAT	LIVER	15		14		3		47		143	
1.000000 UG	RAT	LIVER	16		9		3		51		120	
10.000000 UG	RAT	LIVER	17		11		10		41		143	
100.000000 UG	RAT	LIVER	16		10		4		46		132	
500.000000 UG	RAT	LIVER	11		14		5		37		150	
1000.000000 UG	RAT	LIVER	17		15		11		37		145	

** TA-1535 SODIUM AZIDE 1 UG/PLATE
TA-1537 9-AMINOACRIDINE 50 UG/PLATE
TA-1538 2-NITROFLUORENE 10 UG/PLATE
TA-98 2-NITROFLUORENE 10 UG/PLATE
TA-100 SODIUM AZIDE 1 UG/PLATE

*** TA-1535 2-ANTHRAMINE 2.5 UG/PLATE
TA-1537 2-ANTHRAMINE 2.5 UG/PLATE
TA-1538 2-ANTHRAMINE 2.5 UG/PLATE
TA-98 2-ANTHRAMINE 2.5 UG/PLATE
TA-100 2-ANTHRAMINE 2.5 UG/PLATE

SOLVENT 50 UL PER PLATE

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TABULATION OF REVERTANTS IN AMES ASSAY USING SODIUM ISOPROPLY METHYLPHOSPHONATE WITH AND WITHOUT ACTIVATION - REPEAT TEST

V. RESULTS TABLE G-4

A. NAME OR CODE DESIGNATION OF THE TEST COMPOUND: *EMPA-ISOPROPYL METHYLPHOSPHONIC ACID, SODIUM SALT*
B. SOLVENT: DISTILLED WATER
C. TEST INITIATION DATE: 02/06/79
NOTE: CONCENTRATIONS ARE GIVEN IN MICROLITERS (UL) OR MICROGRAMS (UG) PER PLATE.

TEST	SPECIES	TISSUE	REVERTANTS PER PLATE					
			TA-1537		TA-98		TA-100	
			1	2	1	2	1	2
NONACTIVATION								
SOLVENT CONTROL	---	---	11	14	36	38	110	113
POSITIVE CONTROL**	---	---	441	133	1132	944	1929	1948
TEST COMPOUND								
1000.000000 UG	---	---	6	10	39	33	117	121
2500.000000 UG	---	---	6	8	34	35	101	115
5000.000000 UG	---	---	7	6	36	37	113	97
ACTIVATION								
SOLVENT CONTROL	RAT	LIVER	15	11	42	43	90	106
POSITIVE CONTROL***	RAT	LIVER	425	329	2433	2089	1561	1064
TEST COMPOUND								
1000.000000 UG	RAT	LIVER	12	16	40	52	114	110
2500.000000 UG	RAT	LIVER	12	10	50	34	103	94
5000.000000 UG	RAT	LIVER	3	7	42	39	110	118

TA-1537 9-AMINOACRIDINE 50 UG/PLATE
TA-98 2-NITROFLUORENE 10 UG/PLATE
TA-100 SODIUM AZIDE 1 UG/PLATE

TA-1537 2-ANTHRAMINE 2.5 UG/PLATE
TA-98 2-ANTHRAMINE 2.5 UG/PLATE
TA-100 2-ANTHRAMINE 2.5 UG/PLATE

SOLVENT 50 UL PER PLATE

PROTOCOL

1. PURPOSE

The purpose of this study was to evaluate the test material for genetic activity in a microbial assay with and without the addition of mammalian metabolic activation preparations.

2. MATERIALS

A. Indicator Microorganisms

Salmonella typhimurium	TA-1535
	TA-1537
	TA-1538
	TA-98
	TA-100

B. Activation System

1. Reaction Mixture

Component	Final Concentration/ml
TPN (Sodium salt)	4 µmol
Glucose-6-phosphate	5 µmol
Sodium phosphate (dibasic)	100 µmol
$MgCl_2$	8 µmol
KCL	33 µmol
Homogenate S9 fraction	0.1 ml

2. S9 Homogenate

A 9,000 x g supernatant prepared from Sprague-Dawley adult male rat liver induced by Aroclor 1254 lot #BIO-82 was purchased from Biological Products, Litton Bionetics, Inc. and was used in these assays.

2. MATERIALS (Continued)

C. Positive Control Chemicals

The chemicals used for positive controls in the nonactivation and activation assays are given in the Tables of Section V. Results.

D. Solvent

The solvent employed to prepare the stock solution of the test chemical is given in the Tables of Section V. Results. All dilutions of the test chemical were made using this solvent.

3. EXPERIMENTAL DESIGN

A. Plate Test (Agar Incorporation)

Approximately 10^3 cells from an overnight culture of each indicator strain were added to separate test tubes containing 2.0 ml molten agar supplemented with biotin and a trace of histidine. For nonactivation tests, at least 4 dose levels of the test compound were added to the contents of the appropriate tubes and poured over the surfaces of selective agar plates. In activation tests, at least 4 dose levels of the test chemical were added to the appropriate tubes with cells. Just prior to pouring, an aliquot of reaction mixture (0.5 ml containing the 9,000 x g liver homogenate) was added to each of the activation overlay tubes, which were then mixed, and the contents poured over the surface of a minimal agar plate and allowed to solidify. The plates were incubated for 48 hrs at 37°C and scored for the number of colonies growing on each plate. The concentrations of all chemicals are given in the Tables of Section V. Results. Positive controls using both directly active positive chemicals and those that require metabolic activation were run with each assay.

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* Certain classes of chemicals known to be mutagens and carcinogens do not produce detectable responses using the standard Ames agar incorporation method. Some dialkyl nitrosamines and certain substituted hydrazines are mutagenic in suspension assays, but not in the plate assay. Chemicals of these classes should be screened in a suspension assay.

3. EXPERIMENTAL DESIGN (Continued)

B. Recording and Presenting Data

The numbers of colonies on each plate were counted and recorded on printed forms. These raw data were analyzed in a computer program and reported on a printout. The results are presented as revertants per plate for each indicator strain employed in the assay. The positive and solvent controls are provided as reference points. Other relevant data are provided on the computer printout.

4. EVALUATION CRITERIA

Plate test data consist of direct revertant colony counts obtained from a set of selective agar plates seeded with populations of mutant cells suspended in a semisolid overlay. Because the test chemical and the cells are incubated in the overlay for 2 days, and a few cell divisions occur during the incubation period, the test is semiquantitative in nature. Although these features of the assay reduce the quantitation of results, they provide certain advantages not contained in a quantitative suspension test:

- The small number of cell divisions permits potential mutagens to act on replicating DNA, which is often more sensitive than nonreplicating DNA.
- The combined incubation of the compound and the cells in the overlay permits constant exposure of the indicator cells for 2 days.

A. Surviving Populations

Plate test procedures do not permit exact quantitation of the number of cells surviving chemical treatment. At low concentrations of the test chemical, the surviving population on the treatment plates is essentially the same as that on the negative control plates. At high concentrations, the surviving population is usually reduced by some fraction. Our protocol normally employs several doses ranging over 2 or 3 log concentrations, the highest of these doses being selected to show slight toxicity as determined by subjective criteria.

B. Dose Response Phenomena

The demonstration of dose-related increases in mutant counts is an important criterion in establishing mutagenicity. A factor that might modify dose-response results for a mutagen would be the selection of doses that are too low (usually mutagenicity and toxicity are related). If the highest dose is far lower than a toxic concentration, no increases may be observed over the dose range selected.

4. EVALUATION CRITERIA (Continued)

B. Dose-Response Phenomena

Conversely, if the lowest dose employed is highly cytotoxic, the test chemical may kill any mutants that are induced, and the compound will not appear to be mutagenic.

C. Control Tests

Positive and negative control assays are conducted with each experiment and consist of direct-acting mutagens for nonactivation assays and mutagens that require metabolic biotransformation in activation assays. Negative controls consist of the test compound solvent in the overlay agar together with the other essential components. The negative control plate for each strain gives a reference point to which the test data are compared. The positive control assay is conducted to demonstrate that the test systems are functional with known mutagens.

D. Evaluation Criteria for Ames Assay

Because the procedures used to evaluate the mutagenicity of the test chemical are semiquantitative, the criteria used to determine positive effects are inherently subjective and are based primarily on a historical data base. Most data sets are evaluated using the following criteria:

1. Strains TA-1535, TA-1537 and TA-1538

If the solvent control value is within the normal range, a chemical that produces a positive dose response over three concentrations with the highest increase equal to three times the solvent control value is considered to be mutagenic.

2. Strains TA-98 and TA-100

If the solvent control value is within the normal range, a chemical that produces a positive dose response over three concentrations with the highest increase equal to twice the solvent control value for TA-100 and 2-3 times the solvent control value for strain TA-98 is considered to be mutagenic. For these strains, the dose-response increase should start at approximately the solvent control value.

4. EVALUATION CRITERIA (Continued)

D. Evaluation Criteria for Ames Assay

3. Pattern

Because TA-1535 and TA-100 are both derived from the same parental strain (G-46) and because TA-1538 and TA-98 are both derived from the same parental strain (D3052), there is a built-in redundancy in the microbial assay. In general, the two strains of a set respond to the same mutagen and such a pattern is sought. It is also anticipated that if a given strain, e.g., TA-1537, responds to a mutagen in nonactivation tests, it will generally do so in activation tests (the converse of this relationship is not expected). While similar response patterns are not required for all mutagens, they can be used to enhance the reliability of an evaluation decision.

4. Reproducibility

If a chemical produces a response in a single test that cannot be reproduced in one or more additional runs, the initial positive test data lose significance.

The preceding criteria are not absolute, and other extenuating factors may enter into a final evaluation decision. However, these criteria are applied to the majority of situations and are presented to aid those individuals not familiar with this procedure. As the data base is increased, the criteria for evaluation can be more firmly established.

E. Relationship Between Mutagenicity and Carcinogenicity

It must be emphasized that the Ames Salmonella/Microsome Plate Test is not a definitive test for chemical carcinogens. It is recognized, however, that correlative and functional relationships have been demonstrated between these two endpoints. The results of comparative tests on 300 chemicals by McCann et al. (1975) show an extremely good correlation between results of microbial mutagenesis tests and in vivo rodent carcinogenesis assays.

All evaluations and interpretation of the data presented in this report are based only on the demonstration, or lack, of mutagenic activity.

REFERENCES

Ames, B.N., McCann, J. and Yamasake, E. (1975). Methods for detecting carcinogens and mutagens with the Salmonella/ mammalian-microsome mutagenicity test. Mutation Res. 31, 347-364.

McCann, J., Choi, E., Yamasaki, E. and Ames, B.N. (1975). Detection of carcinogens as mutagens in the Salmonella/microsome test: Assay of 300 chemicals. Proc. Nat. Acad. Sci. 72, 5135-5139.

SECTION H

90-DAY ORAL TOXICITY STUDY IN RATS

IMPA

LBI PROJECT NO. 10734-15

SUMMARY

Sprague Dawley-derived albino rats, both male and female, were presented sodium IMPA in the drinking water at levels of 300, 1000 and 3000 ppm expressed as free acid. Concurrent controls were presented deionized water adjusted to pH 2.5 with hydrochloric acid. Evaluation of the physical condition of the rats, the body weights, the food intake, the liquid intake, hematologic parameters, clinical chemistry parameters, organ weight analysis and gross and microscopic examination of the tissues revealed no adverse effect of test material administration at these levels.

1. OBJECTIVE

The objective of this study was to evaluate the oral toxicity of the test material when administered to rats in the drinking water over a 3 month period.

2. MATERIAL

Three shipments of test material consisting of 5 glass jars containing a white powder and labeled Isopropyl Methylphosphonic acid, sodium salt (IMPA) were received from USAMBDRL by Litton Bionetics, Inc. (LBI) and designated as follows:

LBI Number	Date Received	Label Information	Number of Jars	Amount Received (g)	Usage Dates
3427	12/18/78	Batch 1 #127818	2	550 each	10/23/80 - 12/07/80
3427A	11/13/80	Notebook No. 761-50	1	590	11/17/80 - 12/14/80
6488	12/05/80	761-67 120280	2	1010 and 420	12/15/80 - 01/23/81

The test material was stored at room temperature with the identity, purity and stability determined by the sponsor. Stability and correctness of each formulation were determined by the LBI Chemistry Department. A new formulation was prepared every 7 to 14 days.

3. EXPERIMENTAL DESIGN

One hundred eighty weanling rats, 90 male and 90 female [CRL:COBS CD(SD)BR] were obtained from the Charles River Breeding Laboratories, Inc., Portage, Michigan on September 24, 1980. The animals were acclimated to laboratory conditions for 29 days in the Rockville facility of the Department of Toxicology before treatment was initiated, October 23, 1980 and were 51 days old on this date. The rats were individually housed in stainless steel wire-bottom cages in a temperature controlled animal room. A 12 hour light cycle was maintained via artificial illumination. The feed, Purina Laboratory Chow 5001®, was provided ad libitum except the night prior to bleeding and terminal necropsy when the feed was removed from the cage.

The rats were randomly assigned by the use of a computer generated random numbers table into their respective cages upon arrival into the facility. All study animals were individually identified by the use of cage tapes and ear tags (F series) as listed below. Extra animals were discarded from the study.

Group Number	Animal Numbers		Dose (ppm as free acid)	Average Test Material Intake (mg/kg/day)	
	Males	Females		Males	Females
1	8610-8629	9695-8714	0	0	0
2	8630-8649	8715-8734	300	26.3	34.8
3	8650-8669	8735-8754	1000	97.0	140.7
4	8670-8689	8755-8774	3000	293.1	406.0

The treated animals received the test material [the amount mixed was corrected for sodium salt (1.159)] in their deionized drinking water which was acidified to a pH 2.5 with hydrochloric acid at the doses listed above 7 days for 13 weeks. The control rats were given acidified deionized water.

All animals were observed twice daily for mortality and overt signs of toxicity throughout the study. Detailed observations, body weights, food consumption and liquid consumption (3 day period) were determined weekly. An ophthalmoscopic examination by a staff veterinarian was performed during the acclimation period to insure all study animals were free of eye abnormalities prior to study initiation. An ophthalmoscopic examination required during the final week of study was omitted.

Clinical pathology determinations were performed on the first 8 rats/sex/group by orbital sinus bleeding at Weeks 4, 8 and termination of the study. The same animals were used for all intervals. Clinical hematology was determined at all intervals and consisted of:

- erythrocyte count
- leukocyte count
- differential leukocyte count
- hemoglobin
- hematocrit
- reticulocyte count

3. EXPERIMENTAL DESIGN (Continued)

Clinical chemistry determinations were performed at termination only and consisted of:

Glucose	Serum Glutamic Oxaoacetic Transaminase
Blood Urea Nitrogen	Bilirubin
Serum Glutamic Pyruvic Transaminase	Phosphorus
Creatinine	Calcium

A complete gross necropsy was performed on all animals at the termination of the study. Carbon dioxide was used to kill the rats. The following organs and tissues were taken and preserved in 10% buffered formalin.

Tissues Saved/Examined

Any Unusual Lesions	Esophagus
Brain (Cerebrum, Cerebellum,* Brainstem)	Stomach
Spinal Cord (2 sections, thoracic, cervical)	Small Intestine (Duodenum, Ileum, Jejunum)
Eye (Left)	Large Intestine (Colon, Cecum)
Pituitary	Adrenal Glands*
Salivary Gland (Submandibular)	Pancreas
Heart*	Liver (2 sections)*
Thymus	Kidneys*
Thyroid*	Ovaries/Testes*
Lungs (with Mainstem Bronchi)	Prostate
Trachea	Uteri (Corpus, Cervix)
Spleen*	Skin (Mammary area)
Bone (with marrow) Sternum	Skeletal Muscle Rectus Femoris
Mesenteric Lymph Node	Sciatic Nerve
	Urinary Bladder

Body weights were taken and organ weights indicated by the asterisk were weighed at the termination of the study.

Histopathology was performed on the listed organs and tissues of all rats at the control and 3000 ppm dose levels. In addition, any unusual lesions or observable effects were examined microscopically from the animals of the other two dose levels.

Statistical analysis, when comparing the differences between the treated and control animals, was performed using Dunnett's t-test. A probability value of <0.05 was used as a basis for significance.

4. RESULTS

The analytical chemistry method development and results of analyses have been included in Appendix C.

Observation of the rats during the course of the study revealed no signs indicative of an adverse effect of test material administration. The individual animal observations have been included in Appendix A, Table H-13.

Body weight analysis revealed a slight difference between control and high dose level rats. At Week 11 the high dose males had a decreased body weight compared to control which was statistically significant. There were no other statistically significant decreases and based on the other dosages levels the decrease was not felt to be a test material effect. The mean body weights have been tabulated in Table H-5. The individual data have been included in Appendix A, Table H-14.

Analysis of average daily food intake revealed decreases in the high dose males compared to control which were statistically significant at sporadic points throughout the study. The high dose females exhibited very slight decreases in food intake which were not statistically significant. The increases seen at the other dosage levels led to the conclusion the decreased food intake was not due to test material administration. The mean food intake data have been tabulated in Table H-6, while the individual data have been presented in Appendix A, Table H-15.

No differences were observed in liquid intake which would indicate rejection of the dosed water; in fact some increases in water intake were seen in treated rats compared to the controls. The mean liquid intake data have been tabulated in Table H-7, while the individual data have been presented in Appendix A, Table H-16.

An approximation of dosage based on body weight liquid intake and the mean analyzed concentrations of the drinking water. These data have been presented in Table H-8.

Clinical hematology determinations for Weeks 4, 8 and 12 revealed no effect of test material administration on the parameters examined. The mean values have been tabulated in Table H-9, while the individual data have been presented in Appendix A, Table H-17.

Clinical chemistry determinations mean values have been presented in Table H-10. The individual data have been presented in Appendix A, Table H-18. There were no differences observed between control and treated groups for any of the parameters examined.

LITTON BIONETICS, INC.
PROJECT NO. 10734-15

TABLE H-5

MEAN BODY WEIGHTS (G)

MALES

DOSE LEVEL (PPM)	WEEKS ON TEST 0	1	2	3	4	5	6	7	8	9	10	11	12
0	242.6	288.1	321.8	349.9	372.9	387.0	414.2	423.5	440.1	455.1	466.6	480.9	491.1
300	244.2	289.2	320.3	348.9	367.1	383.6	408.7	416.9	434.5	450.7	464.0	476.0	489.3
1000	255.5	304.5*	340.1*	372.1*	387.9	404.1	427.6	436.0	458.2	476.0	489.9	496.9	507.2
3000	235.9	277.6	307.5	335.6	355.1	370.4	392.3	400.7	418.2	432.3	442.9	453.0*	465.9
FEMALES													
0	169.5	187.4	200.1	209.2	217.6	221.0	234.3	234.0	242.5	247.4	252.9	259.3	259.4
300	175.1	193.5	205.4	216.7	227.1	229.3	244.1	240.1	249.7	255.6	261.3	269.3	269.9
1000	176.6	195.1	207.9	219.4	227.5	229.9	245.7	242.0	254.6	259.9	262.8	271.8	270.8
3000	170.8	186.1	199.2	207.8	215.1	218.3	230.5	229.4	240.6	243.5	247.1	255.4	254.8

*$p<0.05$ as compared to controls: Dunnett's t-test.

LITTON BIONETICS, INC.
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TABLE H-6

MEAN DAILY FOOD INTAKE (G)

MALES

DOSE LEVEL (PPM)	WEEKS ON TEST 1	2	3	4	5	6	7	8	9	10	11	12
0	22.8	23.4	23.0	23.1	22.1	22.9	23.1	22.6	23.2	23.5	22.9	23.4
300	23.4	23.0	23.0	22.6	22.2	22.4	22.9	22.0	24.6	22.8	22.8	23.6
1000	23.7	23.8	24.2	23.8	22.7	22.5	23.4	22.7	24.3	23.6	22.4	23.4
3000	21.9	22.0*	22.1	21.9	21.3	21.6*	21.5*	20.5*	22.2	21.4*	21.7	22.5
FEMALES												
0	16.3	16.2	15.8	15.5	14.8	15.8	15.5	14.8	15.4	15.7	16.4	15.5
300	17.5	17.2	16.8	16.7	16.2	16.1	15.9	15.9	16.2	16.3	16.7	16.1
1000	17.4	17.3	17.5*	16.7	16.1	16.6	16.7*	16.4*	17.1*	16.7	17.1	16.4
3000	16.5	16.3	15.6	16.0	16.1	15.2	15.4	14.9	15.9	15.3	15.8	15.3

*$p<0.05$ as compared to controls: Dunnett's t-test.

LITTON BIONETICS, INC.
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TABLE H-7

MEAN DAILY LIQUID INTAKE (G)

MALES

DOSE LEVEL (PPM)	WEEKS ON TEST 1	2	3	4	5	6	7	8	9	10	11	12
0	36.4	37.3	37.9	40.2	38.7	43.2	38.7	37.8	38.5	36.5	44.3	36.5
300	35.9	34.1	35.4	38.5	38.0	39.8	36.8	28.5	39.4	38.5	46.4	38.5
1000	38.2	36.6	40.2	40.4	40.2	42.6	39.8	42.1	44.7*	39.9	46.3	39.7
3000	35.8	34.8	37.0	38.0	39.5	39.2	34.7	39.6	39.6	35.2	44.3	38.6
FEMALES												
0	32.2	28.2	28.1	31.9	29.9	30.7	29.1	29.3	30.6	30.9	36.7	26.1
300	29.9	27.5	27.3	33.2	29.4	31.5	29.1	29.7	30.9	30.4	36.6	29.0
1000	33.8	32.2*	33.1*	34.1	36.9*	35.5*	34.6*	33.5	36.6*	34.2	39.9	32.6*
3000	28.8	27.8	29.3	33.3	33.3	33.6	31.6	34.0*	35.0	30.0	38.2	32.1*

*p<0.05 as compared to controls: Dunnett's t-test.

LITTON BIONETICS, INC.
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TABLE H-8

COMPOUND INTAKE

DOSE LEVEL (MG/KG/DAY)	WEEKS ON TEST 1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0
300	38.4	30.8	28.9	28.8	27.0	27.1	23.5	17.9	23.7	22.3	26.1	21.2
1000	139.1	111.8	110.0	101.0	96.4	98.1	86.6	89.8	90.8	78.0	87.9	74.3
3000	418.1	345.4	331.5	312.0	306.5	291.6	243.7	272.3	260.9	224.4	275.6	234.8
FEMALES												
0	0	0	0	0	0	0	0	0	0	0	0	0
300	44.6	37.1	34.7	40.0	33.8	35.9	31.1	32.3	32.3	31.1	36.6	28.1
1000	178.1	153.5	148.1	144.6	150.9	143.7	131.0	128.8	133.7	122.4	141.2	111.6
3000	464.6	411.6	405.3	441.5	426.6	424.1	377.7	408.4	400.8	339.4	426.0	346.3

Calculations are based on the mean body weight at the beginning of the week and the liquid intake at the end of the week. The mean analyzed concentrations were used - 261.2, 930.3 and 2755.3 ppm.

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TABLE H-9

MEAN CLINICAL HEMATOLOGY - WEEK 4

MALES

DOSE LEVEL (PPM)	LEUKOCYTE COUNT ($10^3/MM^3$)	ERYTHROCYTE COUNT ($10^6/MM^3$)	HEMOGLOBIN (G%)	HEMATOCRIT (VOL %)	RETICULOCYTE (%)
0	7.14	7.707	16.04	49.19	1.96
300	6.64	7.232	15.80	47.13	2.05
1000	8.70	7.914	16.25	48.56	1.80
3000	7.24	7.371	15.94	47.19	2.42

FEMALES

0	5.61	7.637	16.02	48.06	1.69
300	5.19	7.059	15.42	45.38*	1.87
1000	6.57	7.821	15.85	47.06	1.52
3000	5.29	7.206	15.62	46.00	2.25

*$p<0.05$ as compared to controls: Dunnett's t-test.

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TABLE H-9 (CONTINUED)

MEAN CLINICAL HEMATOLOGY - WEEK 8

MALES

DOSE LEVEL (PPM)	LEUKOCYTE COUNT (10^3/MM^3)	ERYTHROCYTE COUNT (10^6/MM^3)	HEMOGLOBIN (G%)	HEMATOCRIT (VOL %)	RETICULOCYTE (%)
0	6.24	8.277	16.12	48.88	2.42
300	6.19	8.251	15.94	48.25	2.79
1000	7.25	8.496	16.35	48.50	2.06
3000	6.81	7.992	16.35	48.56	1.90

FEMALES

0	5.45	7.929	16.41	49.19	2.24
300	4.41	7.754	16.09	48.25	2.37
1000	4.64	8.176	16.02	47.38	1.81
3000	4.42	7.787	16.05	48.19	1.70

LITTON BIONETICS, INC.
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TABLE H-9 (CONTINUED)

MEAN CLINICAL HEMATOLOGY - WEEK 12

MALES

DOSE LEVEL (PPM)	LEUKOCYTE COUNT (10^3/MM^3)	ERYTHROCYTE COUNT (10^6/MM^3)	HEMOGLOBIN (G%)	HEMATOCRIT (VOL %)	RETICULOCYTE (%)
0	7.67	7.751	16.10	48.0	2.03
300	7.05	7.582	15.82	47.50	1.70
1000	8.76	7.934	16.07	47.81	1.90
3000	7.06	7.805	16.29	48.31	2.15

FEMALES

0	6.07	7.266	15.77	47.31	1.92
300	5.01	6.782	15.52	46.56	1.81
1000	5.42	6.865	15.64	46.06	2.40
3000	5.54	7.000	15.52	45.69	1.57

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TABLE H-10

MEAN CLINICAL CHEMISTRY - WEEK 12

MALES

DOSE LEVEL (PPM)	BILIRUBIN TOTAL (MG/DL)	BLOOD UREA NITROGEN (MG/DL)	CALCIUM (MG/DL)	CREATININE (MG/DL)	GLUCOSE (MG/DL)	PHOSPHORUS (MG/DL)	SERUM GLUTAMIC-OXALOACETIC TRANSAMINASE (MU/ML)	SERUM GLUTAMIC-PYRUVIC TRANSAMINASE (MU/ML)
0	0.07	12.3	11.43	0.50	110.0	5.97	93.1	27.4
300	0.10	13.3	11.49	0.52	115.9	6.17	90.1	33.3
1000	0.10	13.3	11.64	0.59	110.5	6.65	83.4	28.0
3000	0.09	12.1	11.62	0.55	108.9	6.62	93.6	34.8

FEMALES

0	0.10	16.0	11.95	0.56	102.4	6.05	111.3	36.6
300	0.12	15.8	11.81	0.62	111.4	5.40	137.0	40.5
1000	0.14	14.0	12.04	0.61	106.1	5.60	104.4	48.9
3000	0.09	13.8	11.89	0.60	99.8	5.97	96.0	29.0

4. RESULTS (Continued)

The organs weighed at the terminal necropsy were analyzed both as absolute weights and as percentages of body weight. The mean weights have been tabulated in Table H-11 and mean percentages in Table H-12. The individual organ weights and percentages have been included in Appendix A, Tables H-19 and H-20, respectively. Kidneys weights were higher than controls for mid dose male and female rats. The differences were statistically significant for the absolute weights but not so when expressed as a percentage of body weight. No other differences were observed other than a statistically significant increase in absolute heart weight seen in the low dose females. These increases were not related to dosage and were felt not to indicate an effect of test material administration.

Microscopic examination of the tissues taken at necropsy revealed no findings which would indicate any adverse effect occurred due to administration of the test material. The report of the Pathologist, Richard H. Cardy, D.V.M., has been included in Appendix B.

Thirty days after transmittal of this report, original data and a copy of the final report will be transferred to the LBI Archivist, 1330 Piccard Drive, Rockville, Maryland for distribution to the proper repositories, A copy of this report and underlying data were reviewed by the LBI Quality Assurance Unit prior to submission to the sponsor.

LITTON BIONETICS, INC.
PROJECT NO. 10734-15

TABLE H-11

MEAN ORGAN WEIGHTS (GRAMS)

TERMINAL KILL

MALES

DOSE LEVEL (PPM)	BODY WEIGHT	BRAIN	HEART	THYROID	SPLEEN	ADRENALS	LIVER	KIDNEYS	TESTES
0	466.8	2.1290	1.6413	0.0279	0.7659	0.0618	15.8009	3.7819	3.4849
300	463.4	2.1539	1.6802	0.0278	0.7830	0.0711	16.6292	3.9488	3.6408
1000	483.0	2.1384	1.7240	0.0300	0.8071	0.0696	17.2295	4.1075*	3.5449
3000	438.3	2.1436	1.6156	0.0281	0.7355	0.0648	15.4912	3.8331	3.6797

FEMALES

DOSE LEVEL (PPM)	BODY WEIGHT	BRAIN	HEART	THYROID	SPLEEN	ADRENALS	LIVER	KIDNEYS	OVARIES
0	247.3	1.9495	0.9728	0.0246	0.5631	0.0794	9.0236	2.2157	0.1414
300	253.4	1.9740	1.0620*	0.0289	0.5861	0.0805	9.5102	2.3853	0.1252
1000	251.8	1.9812	1.0395	0.0242	0.5843	0.0797	9.5790	2.4231*	0.1489
3000	238.1	1.9619	1.0145	0.0215	0.5526	0.0805	8.3843	2.2853	0.1232

*p<0.05 as compared to controls: Dunnett's t-test.

LITTON BIONETICS, INC.
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TABLE H-12

MEAN ORGAN WEIGHT/BODY WEIGHT PERCENTAGES

TERMINAL KILL

MALES

DOSE LEVEL (PPM)	BRAIN	HEART	THYROID	SPLEEN	ADRENALS	LIVER	KIDNEYS	TESTES
0	0.4586	0.3522	0.0059	0.1644	0.0133	3.3856	0.8108	0.7510
300	0.4678	0.3639	0.0060	0.1688	0.0154	3.5918	0.8537	0.7898
1000	0.4460	0.3572	0.0063	0.1672	0.0145	3.5567	0.8497	0.7399
3000	0.4925	0.3697	0.0064	0.1684	0.0148	3.5410	0.8769	0.8479

FEMALES

DOSE LEVEL (PPM)	BRAIN	HEART	THYROID	SPLEEN	ADRENALS	LIVER	KIDNEYS	OVARIES
0	0.7946	0.3944	0.0101	0.2261	0.0322	3.6642	0.8998	0.0570
300	0.7863	0.4209	0.0117	0.2317	0.0322	3.7522	0.9428	0.0497
1000	0.7934	0.4153	0.0096	0.2356	0.0317	3.8020	0.9648	0.0595
3000	0.8302	0.4272	0.0090	0.2326	0.0338	3.5222	0.9611	0.0514

5. CONCLUSION

Sprague Dawley-derived albino rats, both male and female, were presented sodium IMP in the drinking water at levels of 300, 1000 and 3000 ppm expressed as free acid. Concurrent controls were presented deionized water adjusted to pH 2.5 with hydrochloric acid. Evaluation of the physical condition of the rats, the body weights, the food intake, the liquid intake, hematologic parameters, clinical chemistry parameters, organ weight analysis and gross and microscopic examination of the tissues revealed no adverse effect of test material administration at these levels.

Submitted by:

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Date

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August 11, 1981
Date

Reviewed by:

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Director
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Date

SECTION H

APPENDIX A

TOXICOLOGY OBSERVATION REPORT

TABLE H-13
CLINICAL SIGNS
PROJECT NUMBER - 1073415

WEEK NO. **	DOSE GROUP/SEX *	ANIMAL NUMBER *****	OBSERVATIONS : QUALIFIER COMMENTS **********
000	0 PPM FEMALE	08710	EAR TAG MISSING
			EAR TAG REPLACED : EAR-RIGHT
		*****	EAR TAG NO. 8710E
001	MALE	08615	EAR TAG INFECTION : EAR-RIGHT
		08623	EAR TAG INFECTION : EAR-RIGHT
	FEMALE	08699	EAR TAG INFECTION : EAR-RIGHT
		08710	EAR TAG INFECTION : EAR-RIGHT
	300 PPM MALE	08630	EAR TAG INFECTION : EAR-RIGHT
		08632	EAR TAG INFECTION : EAR-RIGHT
		08637	EAR TAG INFECTION : EAR-RIGHT
	1000 PPM	08651	EAR TAG INFECTION : EAR-RIGHT
		08666	DISCOLORED URINE
		*****	RED
	FEMALE	08742	EAR TAG MISSING
			EAR TAG REPLACED : EAR-LEFT
		*****	#8742F
	3000 PPM MALE	08676	EAR TAG INFECTION : EAR-RIGHT
		08686	EAR TAG INFECTION : EAR-RIGHT
002	0 PPM MALE	08615	EAR TAG INFECTION : EAR-RIGHT
	FEMALE	08699	EAR TAG INFECTION : EAR-RIGHT
		08710	EAR TAG INFECTION : EAR-RIGHT
	300 PPM MALE	08630	EAR TAG INFECTION : EAR-RIGHT
		08637	EAR TAG INFECTION : EAR-RIGHT
		08638	EAR TAG INFECTION : EAR-RIGHT
		08639	EAR TAG INFECTION : EAR-RIGHT
	1000 PPM	08651	EAR TAG INFECTION : EAR-RIGHT
		08655	EAR TAG INFECTION : EAR-RIGHT
		08662	EAR TAG INFECTION : EAR-RIGHT
		08663	EAR TAG INFECTION : EAR-RIGHT
		08667	EAR TAG INFECTION : EAR-RIGHT
		08669	EAR TAG INFECTION : EAR-RIGHT
	3000 PPM	08676	EAR TAG INFECTION : EAR-RIGHT
		08683	EAR TAG INFECTION : EAR-RIGHT
		08686	EAR TAG INFECTION : EAR-RIGHT
003	0 PPM MALE	08613	EAR TAG INFECTION : EAR-RIGHT
		08615	EAR TAG INFECTION : EAR-RIGHT
	300 PPM	08630	EAR TAG INFECTION : EAR-RIGHT
		08632	CRUST : EYE-LEFT:AROUND
		*****	RED

TOXICOLOGY OBSERVATION REPORT

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TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1073415

WEEK NO.	DOSE GROUP	SEX	ANIMAL NUMBER	OBSERVATIONS : QUALIFIER COMMENTS
003	300 PPM	MALE	08635	EAR TAG INFECTION : EAR-RIGHT
			08637	EAR TAG INFECTION : EAR-RIGHT
			08638	EAR TAG INFECTION : EAR-RIGHT
			08639	EAR TAG INFECTION : EAR-RIGHT
		FEMALE	08726	EAR TAG MISSING
	1000 PPM	MALE	08651	EAR TAG INFECTION : EAR-RIGHT
			08653	EAR TAG INFECTION : EAR-RIGHT
			08655	EAR TAG INFECTION : EAR-RIGHT
			08662	EAR TAG INFECTION : EAR-RIGHT
			08663	EAR TAG INFECTION : EAR-RIGHT
			08667	EAR TAG INFECTION : EAR-RIGHT
			08669	EAR TAG INFECTION : EAR-RIGHT
		FEMALE	08739	EAR TAG INFECTION : EAR-RIGHT
	3000 PPM	MALE	08682	EAR TAG INFECTION : EAR-RIGHT
			08683	EAR TAG INFECTION : EAR-RIGHT
			08686	EAR TAG INFECTION : EAR-RIGHT
		FEMALE	08764	EAR TAG INFECTION : EAR-RIGHT
004	0 PPM	MALE	08610	FASTED : OVERNIGHT BLOOD SUBMITTED FOR HEMOGRAM EAR TAG INFECTION : EAR-RIGHT
			08611	FASTED : OVERNIGHT BLOOD SUBMITTED FOR HEMOGRAM EAR TAG INFECTION : EAR-RIGHT
			08612	FASTED : OVERNIGHT BLOOD SUBMITTED FOR HEMOGRAM
			08613	FASTED : OVERNIGHT BLOOD SUBMITTED FOR HEMOGRAM EAR TAG INFECTION : EAR-RIGHT
			08614	FASTED : OVERNIGHT BLOOD SUBMITTED FOR HEMOGRAM
			08615	FASTED : OVERNIGHT BLOOD SUBMITTED FOR HEMOGRAM
			08616	FASTED : OVERNIGHT BLOOD SUBMITTED FOR HEMOGRAM
			08617	FASTED : OVERNIGHT BLOOD SUBMITTED FOR HEMOGRAM
		FEMALE	08695	FASTED : OVERNIGHT BLOOD SUBMITTED FOR HEMOGRAM
			08696	FASTED : OVERNIGHT BLOOD SUBMITTED FOR HEMOGRAM
			08697	FASTED : OVERNIGHT BLOOD SUBMITTED FOR HEMOGRAM
			08698	FASTED : OVERNIGHT

TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1373415

WEEK NO. **	DOSE GROUP/SEX *	ANIMAL NUMBER	OBSERVATIONS : QUALIFIER ***** COMMENTS **********
004	3 PPM FEMALE		BLOOD SUBMITTED FOR HEMOGRAM
			CRUST : EYE-RIGHT:AROUND
		*****	RED
		08699	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08700	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08701	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08702	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
			CRUST : EYE-RIGHT:AROUND
		*****	RED
		08714	EAR TAG MISSING
			EAR TAG REPLACED : EAR-RIGHT
		*****	#87140
	300 PPM MALE	08630	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
			EAR TAG INFECTION : EAR-RIGHT
		08631	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08632	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
			CRUST : EYES:AROUND
		*****	RED
		08633	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08634	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
			EAR TAG INFECTION : EAR-RIGHT
		08635	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
			EAR TAG INFECTION : EAR-RIGHT
		08636	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08637	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08639	EAR TAG INFECTION : EAR-RIGHT
		08648	EAR TAG INFECTION : EAR-RIGHT
	FEMALE	08715	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08716	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08717	FASTED : OVERNIGHT

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TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1073415

WEEK NO. **	DOSE GROUP/SEX *	ANIMAL NUMBER	*****	OBSERVATIONS : QUALIFIER COMMENTS **********
004	300 PPM FEMALE			BLOOD SUBMITTED FOR HEMOGRAM
		08718		FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
		08719		FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
		08720		FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
		08721		FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
		08722		FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
		08724		EAR TAG INFECTION : EAR-RIGHT
		08726		EAR TAG MISSING
				EAR TAG REPLACED : EAR-LEFT
			*****	#8726C
		08728		EAR TAG INFECTION : EAR-RIGHT
	1000 PPM MALE	08650		FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
		08651		FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
		08652		FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
		08653		FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
				EAR TAG INFECTION : EAR-RIGHT
		08654		FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
		08655		FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
				EAR TAG INFECTION : EAR-RIGHT
		08656		FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
		08657		FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
				EAR TAG INFECTION : EAR-RIGHT
		08659		EAR TAG INFECTION : EAR-RIGHT
		08662		EAR TAG INFECTION : EAR-RIGHT
		08663		EAR TAG INFECTION : EAR-RIGHT
		08665		EAR TAG INFECTION : EAR-RIGHT
		08667		EAR TAG INFECTION : EAR-RIGHT
		08669		EAR TAG INFECTION : EAR-RIGHT
	FEMALE	08735		FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
		08736		FASTED : OVERNIGHT

TOXICOLOGY OBSERVATION REPORT

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TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1073415

WEEK NO.	DOSE GROUP	SEX	ANIMAL NUMBER	OBSERVATIONS : QUALIFIER ***** COMMENTS **********
004	1000 PPM	FEMALE		BLOOD SUBMITTED FOR HEMOGRAM
			08737	FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
			08738	FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
				EAR TAG INFECTION : EAR-RIGHT
			08739	FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
			08740	FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
			08741	FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
			08742	FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
	3000 PPM	MALE	08670	FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
			08671	FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
			08672	FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
			08673	FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
			08674	FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
			08675	FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
			08676	FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
			08677	FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
			08678	EAR TAG INFECTION : EAR-RIGHT
			08679	EAR TAG INFECTION : EAR-RIGHT
			08682	EAR TAG INFECTION : EAR-RIGHT
			08683	EAR TAG INFECTION : EAR-RIGHT
			08686	EAR TAG INFECTION : EAR-RIGHT
		FEMALE	08755	FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
			08756	FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
			08757	FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
			08758	FASTED : OVERNIGHT
				BLOOD SUBMITTED FOR HEMOGRAM
			08759	FASTED : OVERNIGHT

TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1073415

WEEK NO. ** DOSE GROUP/SEX *	ANIMAL NUMBER	***** OBSERVATIONS : QUALIFIER COMMENTS **********
004 3000 PPM FEMALE		BLOOD SUBMITTED FOR HEMOGRAM
	08760	FASTED : OVERNIGHT
		BLOOD SUBMITTED FOR HEMOGRAM
	08761	FASTED : OVERNIGHT
		BLOOD SUBMITTED FOR HEMOGRAM
	08762	FASTED : OVERNIGHT
		BLOOD SUBMITTED FOR HEMOGRAM
	08764	EAR TAG INFECTION : EAR-RIGHT
005 0 PPM MALE	08610	EAR TAG INFECTION : EAR-RIGHT
	08611	EAR TAG INFECTION : EAR-RIGHT
	08613	EAR TAG INFECTION : EAR-RIGHT
	08625	EAR TAG INFECTION : EAR-RIGHT
300 PPM	08630	EAR TAG INFECTION : EAR-RIGHT
	08632	CRUST : EYE-RIGHT:AROUND
	*****	RED
	08634	EAR TAG INFECTION : EAR-RIGHT
	08635	EAR TAG INFECTION : EAR-RIGHT
	08639	EAR TAG INFECTION : EAR-RIGHT
FEMALE	08728	EAR TAG INFECTION : EAR-RIGHT
	08732	EAR TAG INFECTION : EAR-RIGHT
1000 PPM MALE	08653	EAR TAG INFECTION : EAR-RIGHT
	08655	EAR TAG INFECTION : EAR-RIGHT
	08657	EAR TAG INFECTION : EAR-RIGHT
	08659	EAR TAG INFECTION : EAR-RIGHT
	08663	EAR TAG INFECTION : EAR-RIGHT
	08664	EAR TAG MISSING
	08665	EAR TAG INFECTION : EAR-RIGHT
	08667	EAR TAG INFECTION : EAR-RIGHT
FEMALE	08738	EAR TAG INFECTION : EAR-RIGHT
3000 PPM MALE	08678	EAR TAG INFECTION : EAR-RIGHT
	08679	EAR TAG INFECTION : EAR-RIGHT
	08682	EAR TAG INFECTION : EAR-RIGHT
	08683	EAR TAG INFECTION : EAR-RIGHT
	08685	EAR TAG INFECTION : EAR-RIGHT
	08686	EAR TAG INFECTION : EAR-RIGHT
	08688	EAR TAG INFECTION : EAR-RIGHT
006 0 PPM MALE	08610	EAR TAG INFECTION : EAR-RIGHT
	08611	THICKENED EAR(S) : EAR-RIGHT
	08613	EAR TAG INFECTION : EAR-RIGHT
	08614	EAR TAG INFECTION : EAR-RIGHT
	08615	EAR TAG INFECTION : EAR-RIGHT
	08624	THICKENED EAR(S) : EAR-RIGHT

TOXICOLOGY OBSERVATION REPORT

TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1073415

WEEK NO.	DOSE GROUP/SEX	ANIMAL NUMBER	OBSERVATIONS : QUALIFIER ***** COMMENTS **********
006	0 PPM MALE	08625	EAR TAG INFECTION : EAR-RIGHT
	300 PPM	08630	EAR TAG INFECTION : EAR-RIGHT
		08632	DISCHARGE : EYE-RIGHT
		08634	EAR TAG INFECTION : EAR-RIGHT
		08635	EAR TAG INFECTION : EAR-RIGHT
		08637	EAR TAG INFECTION : EAR-RIGHT
		08639	EAR TAG INFECTION : EAR-RIGHT
		08642	EAR TAG INFECTION : EAR-RIGHT
		08648	EAR TAG INFECTION : EAR-RIGHT
		08649	THICKENED EAR(S) : EAR-RIGHT
	FEMALE	08725	LACRIMATION : EYE-RIGHT
		08728	EAR TAG INFECTION : EAR-RIGHT
		08732	THICKENED EAR(S) : EAR-RIGHT
	1000 PPM MALE	08653	EAR TAG INFECTION : EAR-RIGHT
		08655	EAR TAG INFECTION : EAR-RIGHT
		08657	EAR TAG INFECTION : EAR-RIGHT
		08659	EAR TAG INFECTION : EAR-RIGHT
		08662	EAR TAG INFECTION : EAR-RIGHT
		08663	EAR TAG INFECTION : EAR-RIGHT
		08664	EAR TAG MISSING
		08665	EAR TAG INFECTION : EAR-RIGHT
		08667	THICKENED EAR(S) : EAR-RIGHT
		08669	THICKENED EAR(S) : EAR-RIGHT
	FEMALE	08738	EAR TAG INFECTION : EAR-RIGHT
		08740	THICKENED EAR(S) : EARS-BOTH
	3000 PPM MALE	08671	LOCAL HAIR LOSS : LIMBS-FORE
		08678	EAR TAG INFECTION : EAR-RIGHT
		08679	EAR TAG INFECTION : EAR-RIGHT
		08680	EAR TAG INFECTION : EAR-RIGHT
		08681	THICKENED EAR(S) : EAR-RIGHT
		08682	EAR TAG INFECTION : EAR-RIGHT
		08683	THICKENED EAR(S) : EAR-RIGHT
		08685	EAR TAG INFECTION : EAR-RIGHT
		08686	EAR TAG INFECTION : EAR-RIGHT
		08688	THICKENED EAR(S) : EAR-RIGHT
	FEMALE	08755	ROUGH HAIR COAT
		08763	EAR TAG MISSING
		08764	EAR TAG INFECTION : EAR-RIGHT
		08766	LACRIMATION : EYES-BOTH
		08772	EAR TAG INFECTION : EAR-RIGHT
007	0 PPM MALE	08610	EAR TAG INFECTION : EAR-RIGHT
		08611	THICKENED EAR(S) : EAR-RIGHT
		08613	EAR TAG INFECTION : EAR-RIGHT

TOXICOLOGY OBSERVATION REPORT

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TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1073415

WEEK NO. **	DOSE GROUP/SEX *	ANIMAL NUMBER	***** OBSERVATIONS : QUALIFIER COMMENTS **********
007	0 PPM MALE	08614	EAR TAG INFECTION : EAR-RIGHT
		08615	EAR TAG INFECTION : EAR-RIGHT
		08625	EAR TAG INFECTION : EAR-RIGHT
	300 PPM	08630	EAR TAG INFECTION : EAR-RIGHT
		08632	CRUST : EYE-LEFT:AROUND
		*****	RED
		08634	EAR TAG INFECTION : EAR-RIGHT
		08635	EAR TAG INFECTION : EAR-RIGHT
		08637	EAR TAG INFECTION : EAR-RIGHT
		08639	EAR TAG INFECTION : EAR-RIGHT
		08642	EAR TAG INFECTION : EAR-RIGHT
		08643	EAR TAG INFECTION : EAR-RIGHT
		08648	EAR TAG INFECTION : EAR-RIGHT
	FEMALE	08732	EAR TAG INFECTION : EAR-RIGHT
	1000 PPM MALE	08652	EAR TAG MISSING
		08653	EAR TAG INFECTION : EAR-RIGHT
		08655	EAR TAG INFECTION : EAR-RIGHT
		08657	EAR TAG INFECTION : EAR-RIGHT
		08659	EAR TAG INFECTION : EAR-RIGHT
		08662	EAR TAG INFECTION : EAR-RIGHT
		08663	EAR TAG INFECTION : EAR-RIGHT
			CRUST : EYE-RIGHT:AROUND
		*****	RED
		08664	EAR TAG MISSING
			EAR TAG REPLACED : EAR-RIGHT
		*****	#8664A
		08665	EAR TAG INFECTION : EAR-RIGHT
		08667	EAR TAG INFECTION : EAR-RIGHT
		08669	EAR TAG INFECTION : EAR-RIGHT
	FEMALE	08737	CONVULSIONS-CLONIC
			EXCESSIVE SALIVATION
		08738	EAR TAG INFECTION : EAR-RIGHT
		08740	THICKENED EAR(S) : EAR-RIGHT
	3000 PPM MALE	08671	LOCAL HAIR LOSS : LIMBS-FORE
		08678	EAR TAG INFECTION : EAR-RIGHT
		08679	EAR TAG INFECTION : EAR-RIGHT
		08680	EAR TAG INFECTION : EAR-RIGHT
		08681	EAR TAG INFECTION : EAR-RIGHT
		08682	EAR TAG INFECTION : EAR-RIGHT
		08685	EAR TAG INFECTION : EAR-RIGHT
		08686	EAR TAG INFECTION : EAR-RIGHT
		08688	EAR TAG INFECTION : EAR-RIGHT
	FEMALE	08755	ROUGH HAIR COAT
		08763	EAR TAG MISSING

TOXICOLOGY OBSERVATION REPORT

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TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1073415

WEEK NO.	** DOSE GROUP/SEX *	ANIMAL NUMBER	***** OBSERVATIONS : QUALIFIER COMMENTS **********
007	3000 PPM FEMALE		EAR TAG REPLACED : EAR-LEFT
		*****	#8763A
		08764	EAR TAG INFECTION : EAR-RIGHT
		08770	EAR TAG INFECTION : EAR-RIGHT
		08772	EAR TAG INFECTION : EAR-RIGHT
008	0 PPM MALE	08610	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08611	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08612	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08613	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08614	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08615	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
			EAR TAG INFECTION : EAR-RIGHT
		08616	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08617	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08624	EAR TAG INFECTION : EAR-RIGHT
		08625	TEETH CUT
			EAR TAG INFECTION : EAR-RIGHT
			CRUST : EYE-LEFT:AROUND
		*****	RED
	FEMALE	08695	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08696	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08697	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08698	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08699	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08700	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08701	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08702	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM

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TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1073415

WEEK NO.	** DOSE GROUP/SEX	* ANIMAL NUMBER	***** OBSERVATIONS : QUALIFIER COMMENTS **********
008	0 PPM FEMALE	08704	EAR TAG INFECTION : EAR-RIGHT
	300 PPM MALE	08630	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
			EAR TAG INFECTION : EAR-RIGHT
		08631	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08632	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08633	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08634	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
			EAR TAG INFECTION : EAR-RIGHT
		08635	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08636	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
			CRUST : EYE-RIGHT:AROUND
		*****	RED
		08637	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
			EAR TAG INFECTION : EAR-RIGHT
		08639	EAR TAG INFECTION : EAR-RIGHT
		08642	EAR TAG INFECTION : EAR-RIGHT
		08646	EAR TAG MISSING
			EAR TAG REPLACED : EAR-LEFT
		*****	#8646F
		08648	EAR TAG INFECTION : EAR-RIGHT
	FEMALE	08715	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08716	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08717	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08718	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08719	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
			CRUST : EYE-RIGHT:AROUND
		*****	RED
		08720	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08721	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM

TOXICOLOGY OBSERVATION REPORT

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TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1073415

WEEK NO. **	DOSE GROUP/SEX *	ANIMAL NUMBER *****	OBSERVATIONS : QUALIFIER COMMENTS **********
008	300 PPM FEMALE	08722	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
			CRUST : EYE-RIGHT:AROUND
		*****	RED
	1000 PPM MALE	08650	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08651	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
			EAR TAG INFECTION : EAR-RIGHT
		08652	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
			EAR TAG MISSING
			EAR TAG REPLACED : EAR-LEFT
		*****	#8652A
			CRUST : EYE-RIGHT:AROUND
		*****	RED
		08653	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08654	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08655	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
			EAR TAG INFECTION : EAR-RIGHT
		08656	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08657	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08659	EAR TAG INFECTION : EAR-RIGHT
		08661	EAR TAG INFECTION : EAR-RIGHT
		08662	EAR TAG INFECTION : EAR-RIGHT
		08663	TEETH CUT
			EAR TAG INFECTION : EAR-RIGHT
			CRUST : EYE-RIGHT:AROUND
		*****	RED
		08665	EAR TAG INFECTION : EAR-RIGHT
		08667	EAR TAG INFECTION : EAR-RIGHT
		08669	EAR TAG INFECTION : EAR-RIGHT
	FEMALE	08735	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08736	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08737	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08738	FASTED : OVERNIGHT

TOXICOLOGY OBSERVATION REPORT

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TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1073415

WEEK NO. **	DOSE GROUP/SEX *	ANIMAL NUMBER	OBSERVATIONS : QUALIFIER ***** COMMENTS **********
008	1000 PPM FEMALE		BLOOD SUBMITTED FOR HEMOGRAM
			EAR TAG INFECTION : EAR-RIGHT
			CRUST : EYE-RIGHT:AROUND
		*****	RED
		09739	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
			EYE OPACITY-RIGHT EYE
			CRUST : EYE-RIGHT:AROUND
		*****	BROWN
		08740	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08741	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08742	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
	3000 PPM MALE	08670	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08671	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08672	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08673	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08674	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08675	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08676	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08677	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08679	EAR TAG INFECTION : EAR-RIGHT
		08680	EAR TAG INFECTION : EAR-RIGHT
		08681	EAR TAG INFECTION : EAR-RIGHT
		08682	EAR TAG INFECTION : EAR-RIGHT
		08685	EAR TAG INFECTION : EAR-RIGHT
		08686	EAR TAG INFECTION : EAR-RIGHT
	FEMALE	08755	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08756	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08757	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08758	FASTED : OVERNIGHT

TOXICOLOGY OBSERVATION REPORT

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TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1073415

WEEK NO.	DOSE GROUP/SEX	ANIMAL NUMBER	OBSERVATIONS : QUALIFIER ***** COMMENTS **********
008	3000 PPM FEMALE		BLOOD SUBMITTED FOR HEMOGRAM
		08759	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08760	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08761	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
		08762	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR HEMOGRAM
			CRUST : EYE-RIGHT:AROUND
		*****	RED
		08764	EAR TAG INFECTION : EAR-RIGHT
		08772	EAR TAG INFECTION : EAR-RIGHT
009	0 PPM MALE	08615	EAR TAG INFECTION : EAR-RIGHT
		08625	TEETH CUT
			CRUST : EYE-LEFT:AROUND
		*****	RED
		08627	EAR TAG INFECTION : EAR-RIGHT
	300 PPM	08633	EAR TAG INFECTION : EAR-RIGHT
		08634	EAR TAG INFECTION : EAR-RIGHT
		08637	EAR TAG INFECTION : EAR-RIGHT
		08642	EAR TAG INFECTION : EAR-RIGHT
		08648	EAR TAG INFECTION : EAR-RIGHT
	1000 PPM	08651	EAR TAG INFECTION : EAR-RIGHT
		08655	EAR TAG INFECTION : EAR-RIGHT
		08659	EAR TAG INFECTION : EAR-RIGHT
		08661	EAR TAG INFECTION : EAR-RIGHT
		08663	TEETH CUT
			EAR TAG INFECTION : EAR-RIGHT
		08665	EAR TAG INFECTION : EAR-RIGHT
		08667	EAR TAG INFECTION : EAR-RIGHT
		08669	EAR TAG INFECTION : EAR-RIGHT
	FEMALE	08735	EAR TAG INFECTION : EAR-RIGHT
		08738	EAR TAG INFECTION : EAR-RIGHT
		08739	EYE OPACITY-RIGHT EYE
			CRUST : EYE-RIGHT:AROUND
		*****	BROWN
	3000 PPM MALE	08671	LOCAL HAIR LOSS : LIMBS-FORE
		08679	EAR TAG INFECTION : EAR-RIGHT
		08680	EAR TAG INFECTION : EAR-RIGHT
		08682	EAR TAG INFECTION : EAR-RIGHT
		08685	EAR TAG INFECTION : EAR-RIGHT
		08686	EAR TAG INFECTION : EAR-RIGHT

TOXICOLOGY OBSERVATION REPORT

TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1073415

WEEK NO.	DOSE GROUP	SEX	ANIMAL NUMBER	OBSERVATIONS : QUALIFIER ***** COMMENTS **********
009	3000 PPM	FEMALE	08764	EAR TAG INFECTION : EAR-RIGHT
			08772	EAR TAG INFECTION : EAR-RIGHT
			08774	CRUST : EYE-LEFT:AROUND
			*****	RED
010	0 PPM	MALE	08615	EAR TAG INFECTION : EAR-RIGHT
			08625	TEETH CUT
			08627	EAR TAG INFECTION : EAR-RIGHT
	300 PPM		08634	EAR TAG INFECTION : EAR-RIGHT
			08637	EAR TAG INFECTION : EAR-RIGHT
			08642	EAR TAG INFECTION : EAR-RIGHT
	1000 PPM		08651	EAR TAG INFECTION : EAR-RIGHT
			08655	EAR TAG INFECTION : EAR-RIGHT
			08659	EAR TAG INFECTION : EAR-RIGHT
			08661	EAR TAG INFECTION : EAR-RIGHT
			08663	TEETH CUT
			08667	EAR TAG INFECTION : EAR-RIGHT
		FEMALE	08739	EYE OPACITY-RIGHT EYE
				CRUST : EYE-RIGHT:AROUND
			*****	BROWN
	3000 PPM	MALE	08670	EAR TAG MISSING
			08671	LOCAL HAIR LOSS : LIMBS-FORE
			08679	EAR TAG INFECTION : EAR-RIGHT
			08680	TEETH CUT
				CRUST : EYE-LEFT:AROUND
			*****	RED
			08682	EAR TAG INFECTION : EAR-RIGHT
			08685	EAR TAG INFECTION : EAR-RIGHT
			08686	EAR TAG INFECTION : EAR-RIGHT
		FEMALE	08766	EAR TAG MISSING
			08772	EAR TAG INFECTION : EAR-RIGHT
011	0 PPM	MALE	08612	EYE DISCHARGE : EYE-LEFT
			*****	CLEAR
			08615	EAR TAG INFECTION : EAR-RIGHT
				SMALL ULCERATION(<1CM) : EAR-RIGHT:BELOW
			*****	W/ CRUST
			08617	EAR TAG MISSING
			08625	TEETH CUT
				EAR TAG INFECTION : EAR-RIGHT
			08627	EAR TAG INFECTION : EAR-RIGHT
		FEMALE	08707	EAR TAG INFECTION : EAR-RIGHT
			08711	TEETH CUT
				CRUST : EYE-LEFT:AROUND
			*****	BROWN

TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1073415

WEEK NO. **	DOSE GROUP/SEX *	ANIMAL NUMBER	***** OBSERVATIONS : QUALIFIER COMMENTS **********
011	0 PPM FEMALE	08712	TEETH CUT
	300 PPM MALE	08630	TEETH CUT
			EAR TAG INFECTION : EAR-RIGHT
		08634	EAR TAG INFECTION : EAR-RIGHT
		08637	EAR TAG INFECTION : EAR-RIGHT
		08638	TEETH CUT
		08642	EAR TAG INFECTION : EAR-RIGHT
		08647	EAR TAG INFECTION : EAR-RIGHT
	FEMALE	08722	EAR TAG INFECTION : EAR-RIGHT
		08723	EYE DISCHARGE : EYE-LEFT
		*****	CLEAR
		08725	SKIN FLAKY : TAIL
		08728	SKIN FLAKY : TAIL
	1000 PPM MALE	08651	EAR TAG INFECTION : EAR-RIGHT
		08655	EAR TAG INFECTION : EAR-RIGHT
		08657	EAR TAG INFECTION : EAR-RIGHT
		08659	EAR TAG INFECTION : EAR-RIGHT
		08661	EAR TAG INFECTION : EAR-RIGHT
		08662	TEETH CUT
		08663	TEETH CUT
			EAR TAG INFECTION : EAR-RIGHT
		08665	EAR TAG INFECTION : EAR-RIGHT
		08666	EAR TAG INFECTION : EAR-RIGHT
		08667	EAR TAG INFECTION : EAR-RIGHT
	FEMALE	08739	LOCAL HAIR LOSS : LIMB-FORE,LEFT
			CRUST : EYE-RIGHT
		*****	ON CORNEA
			CRUST : EYE-RIGHT:AROUND
		*****	BROWN
		08748	SKIN FLAKY : TAIL
			ULCERATION : MULTIPLE SITES
		*****	TAIL
	3000 PPM MALE	08670	EAR TAG REPLACED : EAR-LEFT
		*****	8670A
		08671	LOCAL HAIR LOSS : LIMBS-FORE
		08673	TEETH CUT
			EAR TAG INFECTION : EAR-RIGHT
		08679	EAR TAG INFECTION : EAR-RIGHT
		08680	TEETH CUT
			CRUST : EYE-RIGHT:AROUND
		08682	EAR TAG INFECTION : EAR-RIGHT
		08683	EAR TAG INFECTION : EAR-RIGHT
		08685	EAR TAG INFECTION : EAR-RIGHT
		08686	EAR TAG INFECTION : EAR-RIGHT

TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1073415

WEEK NO. **	DOSE GROUP/SEX *	ANIMAL NUMBER	***** OBSERVATIONS : QUALIFIER COMMENTS **********
011	3000 PPM MALE	08688	EAR TAG INFECTION : EAR-RIGHT
		08689	EAR TAG INFECTION : EAR-RIGHT
	FEMALE	08761	SMALL ULCERATION(<1CM) : MULTIPLE SITES
		*****	TAIL
		08764	EAR TAG INFECTION : EAR-RIGHT
		08766	EAR TAG REPLACED : EAR-LEFT
		*****	8766A
012	0 PPM MALE	08612	CRUST : EYE-LEFT:AROUND
		08615	EAR TAG INFECTION : EAR-RIGHT
			SMALL ULCERATION(<1CM) : EAR-RIGHT:BELOW
		*****	W/ CRUST
		08616	CRUST : EYE-LEFT:AROUND
		08617	EAR TAG REPLACED : EAR-RIGHT
		*****	8617A
		08625	TEETH CUT
			EAR TAG INFECTION : EAR-RIGHT
		08627	EAR TAG INFECTION : EAR-RIGHT
	FEMALE	08711	TEETH CUT
		08712	TEETH CUT
		08714	TEETH CUT
	300 PPM MALE	08630	THICKENED EAR(S) : EAR-RIGHT
		08634	EAR TAG INFECTION : EAR-RIGHT
		08637	EAR TAG INFECTION : EAR-RIGHT
		08642	EAR TAG INFECTION : EAR-RIGHT
		08647	EAR TAG INFECTION : EAR-RIGHT
	FEMALE	08722	EAR TAG INFECTION : EAR-RIGHT
		08725	SKIN FLAKY : TAIL
		08729	SKIN FLAKY : TAIL
	1000 PPM MALE	08651	EAR TAG INFECTION : EAR-RIGHT
		08657	EAR TAG INFECTION : EAR-RIGHT
		08661	EAR TAG INFECTION : EAR-RIGHT
		08662	TEETH CUT
		08663	TEETH CUT
			EAR TAG INFECTION : EAR-RIGHT
		08665	EAR TAG INFECTION : EAR-RIGHT
		08666	EAR TAG INFECTION : EAR-RIGHT
		08667	EAR TAG INFECTION : EAR-RIGHT
	FEMALE	08735	EAR TAG INFECTION : EAR-RIGHT
		08737	THICKENED EAR(S) : EARS-BOTH
		08739	LOCAL HAIR LOSS : LIMBS-FORE
			LOCAL HAIR LOSS : EYE-RIGHT:AROUND
			CRUST : EYE-RIGHT
		*****	RED, ON CORNEA

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TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1073415

WEEK NO.	DOSE GROUP/SEX	ANIMAL NUMBER	OBSERVATIONS : QUALIFIER ***** COMMENTS **********
012	1000 PPM FEMALE	08740	THICKENED EAR(S) : EARS-BOTH
			ENLARGED : EAR-RIGHT
		08748	SKIN ABNORMAL : TAIL
		*****	FLAKY
			SMALL MASS(<1CM) : NOSE:ABOVE
		*****	FIRM
			SMALL SCAB(<1CM) : TAIL
		*****	SEVERAL
		08754	EAR TAG INFECTION : EAR-RIGHT
	3000 PPM MALE	08671	LOCAL HAIR LOSS : LIMBS-FORE
		08673	EAR TAG INFECTION : EAR-RIGHT
		08679	EAR TAG INFECTION : EAR-RIGHT
		08680	TEETH CUT
			CRUST : EYE-RIGHT:AROUND
		*****	RED
		08681	THICKENED EAR(S) : EAR-RIGHT
		08682	THICKENED EAR(S) : EAR-RIGHT
		08683	EAR TAG INFECTION : EAR-RIGHT
		08685	EAR TAG INFECTION : EAR-RIGHT
		08686	EAR TAG INFECTION : EAR-RIGHT
		08688	THICKENED EAR(S) : EAR-RIGHT
		08689	THICKENED EAR(S) : EAR-RIGHT
	FEMALE	08760	THICKENED EAR(S) : EAR-RIGHT
		08761	SMALL SCAB(<1CM) : TAIL
		*****	SEVERAL
		08764	EAR TAG INFECTION : EAR-RIGHT
013	0 PPM MALE	08610	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08611	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08612	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08613	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08614	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08615	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08616	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08617	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
			TERMINAL KILL

TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1073415

WEEK NO. **	DOSE GROUP/SEX *	ANIMAL NUMBER	***** OBSERVATIONS : QUALIFIER COMMENTS **********
013	0 PPM MALE		FASTED : OVERNIGHT
		08618	TERMINAL KILL
			FASTED : OVERNIGHT
		08619	TERMINAL KILL
			FASTED : OVERNIGHT
		08620	TERMINAL KILL
			FASTED : OVERNIGHT
		08621	TERMINAL KILL
			FASTED : OVERNIGHT
		08622	TERMINAL KILL
			FASTED : OVERNIGHT
		08623	TERMINAL KILL
			FASTED : OVERNIGHT
		08624	TERMINAL KILL
			FASTED : OVERNIGHT
		08625	TERMINAL KILL
			FASTED : OVERNIGHT
		08626	TERMINAL KILL
			FASTED : OVERNIGHT
		08627	TERMINAL KILL
			FASTED : OVERNIGHT
		08628	TERMINAL KILL
			FASTED : OVERNIGHT
		08629	TERMINAL KILL
			FASTED : OVERNIGHT
	FEMALE	08695	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08696	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08697	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08698	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08699	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08700	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08701	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08702	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
			TERMINAL KILL
			FASTED : OVERNIGHT
		08703	TERMINAL KILL

TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1073415

WEEK NO. **	DOSE GROUP/SEX *	ANIMAL NUMBER	***** OBSERVATIONS : QUALIFIER COMMENTS **********
013	0 PPM FEMALE		FASTED : OVERNIGHT
		08704	TERMINAL KILL
			FASTED : OVERNIGHT
		08705	TERMINAL KILL
			FASTED : OVERNIGHT
		08706	TERMINAL KILL
			FASTED : OVERNIGHT
		08707	TERMINAL KILL
			FASTED : OVERNIGHT
		08708	TERMINAL KILL
			FASTED : OVERNIGHT
		08709	TERMINAL KILL
			FASTED : OVERNIGHT
		08710	TERMINAL KILL
			FASTED : OVERNIGHT
		08711	TERMINAL KILL
			FASTED : OVERNIGHT
		08712	TERMINAL KILL
			FASTED : OVERNIGHT
		08713	TERMINAL KILL
			FASTED : OVERNIGHT
		08714	TERMINAL KILL
			FASTED : OVERNIGHT
	300 PPM MALE	08630	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08631	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08632	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08633	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08634	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08635	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08636	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
			TERMINAL KILL
			FASTED : OVERNIGHT
		08637	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
			TERMINAL KILL
			FASTED : OVERNIGHT
		08638	TERMINAL KILL

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TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1073415

WEEK NO. ** DOSE GROUP/SEX *	ANIMAL NUMBER *****	OBSERVATIONS : QUALIFIER COMMENTS **********
013 300 PPM MALE		FASTED : OVERNIGHT
	08639	TERMINAL KILL
		FASTED : OVERNIGHT
	08640	TERMINAL KILL
		FASTED : OVERNIGHT
	08641	TERMINAL KILL
		FASTED : OVERNIGHT
	08642	TERMINAL KILL
		FASTED : OVERNIGHT
	08643	TERMINAL KILL
		FASTED : OVERNIGHT
	08644	TERMINAL KILL
		FASTED : OVERNIGHT
	08645	TERMINAL KILL
		FASTED : OVERNIGHT
	08646	TERMINAL KILL
		FASTED : OVERNIGHT
	08647	TERMINAL KILL
		FASTED : OVERNIGHT
	08648	TERMINAL KILL
		FASTED : OVERNIGHT
	08649	TERMINAL KILL
		FASTED : OVERNIGHT
FEMALE	08715	FASTED : OVERNIGHT
		BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
	08716	FASTED : OVERNIGHT
		BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
	08717	FASTED : OVERNIGHT
		BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
	08718	FASTED : OVERNIGHT
		BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
	08719	FASTED : OVERNIGHT
		BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
	08720	FASTED : OVERNIGHT
		BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
	08721	FASTED : OVERNIGHT
		BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
	08722	FASTED : OVERNIGHT
		BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		TERMINAL KILL
		FASTED : OVERNIGHT
	08723	TERMINAL KILL
		FASTED : OVERNIGHT
	08724	TERMINAL KILL

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TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1C73415

WEEK NO.	DOSE GROUP/SEX	ANIMAL NUMBER	OBSERVATIONS : QUALIFIER ***** COMMENTS **********
013	300 PPM FEMALE		FASTED : OVERNIGHT
		08725	TERMINAL KILL
			FASTED : OVERNIGHT
		08726	TERMINAL KILL
			FASTED : OVERNIGHT
		08727	TERMINAL KILL
			FASTED : OVERNIGHT
		08728	TERMINAL KILL
			FASTED : OVERNIGHT
		08729	TERMINAL KILL
			FASTED : OVERNIGHT
		08730	TERMINAL KILL
			FASTED : OVERNIGHT
		08731	TERMINAL KILL
			FASTED : OVERNIGHT
		08732	TERMINAL KILL
			FASTED : OVERNIGHT
		08733	TERMINAL KILL
			FASTED : OVERNIGHT
		08734	TERMINAL KILL
			FASTED : OVERNIGHT
	1000 PPM MALE	08650	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08651	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08652	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08653	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08654	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08655	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08656	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08657	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
			TERMINAL KILL
			FASTED : OVERNIGHT
		08658	TERMINAL KILL
			FASTED : OVERNIGHT
		08659	TERMINAL KILL
			FASTED : OVERNIGHT
		08660	TERMINAL KILL

TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1C73415

WEEK NO. **	DOSE GROUP/SEX *	ANIMAL NUMBER	***** OBSERVATIONS : QUALIFIER COMMENTS **********
013	1000 PPM MALE		FASTED : OVERNIGHT
		08661	TERMINAL KILL
			FASTED : OVERNIGHT
		08662	TERMINAL KILL
			FASTED : OVERNIGHT
		08663	TERMINAL KILL
			FASTED : OVERNIGHT
		08664	TERMINAL KILL
			FASTED : OVERNIGHT
		08665	TERMINAL KILL
			FASTED : OVERNIGHT
		08666	TERMINAL KILL
			FASTED : OVERNIGHT
		08667	TERMINAL KILL
			FASTED : OVERNIGHT
		08668	TERMINAL KILL
			FASTED : OVERNIGHT
		08669	TERMINAL KILL
			FASTED : OVERNIGHT
	FEMALE	08735	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08736	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08737	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08738	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08739	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08740	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08741	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
			TERMINAL KILL
			FASTED : OVERNIGHT
		08742	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
			TERMINAL KILL
			FASTED : OVERNIGHT
		08743	TERMINAL KILL
			FASTED : OVERNIGHT
		08744	TERMINAL KILL
			FASTED : OVERNIGHT
		08745	TERMINAL KILL

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TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1073415

WEEK NO.	DOSE GROUP/SEX	ANIMAL NUMBER	OBSERVATIONS : QUALIFIER ***** COMMENTS **********
013	1000 PPM FEMALE		FASTED : OVERNIGHT
		08746	TERMINAL KILL
			FASTED : OVERNIGHT
		08747	TERMINAL KILL
			FASTED : OVERNIGHT
		08748	TERMINAL KILL
			FASTED : OVERNIGHT
		08749	TERMINAL KILL
			FASTED : OVERNIGHT
		08750	TERMINAL KILL
			FASTED : OVERNIGHT
		08751	TERMINAL KILL
			FASTED : OVERNIGHT
		08752	TERMINAL KILL
			FASTED : OVERNIGHT
		08753	TERMINAL KILL
			FASTED : OVERNIGHT
		08754	TERMINAL KILL
			FASTED : OVERNIGHT
	3000 PPM MALE	08670	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08671	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08672	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08673	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08674	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08675	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08676	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08677	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
			TERMINAL KILL
			FASTED : OVERNIGHT
		08678	TERMINAL KILL
			FASTED : OVERNIGHT
		08679	TERMINAL KILL
			FASTED : OVERNIGHT
		08680	TERMINAL KILL
			FASTED : OVERNIGHT
		08681	TERMINAL KILL

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TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1073415

WEEK NO.	DOSE GROUP/SEX	ANIMAL NUMBER	OBSERVATIONS : QUALIFIER ***** COMMENTS **********
013	3000 PPM MALE		FASTED : OVERNIGHT
		08682	TERMINAL KILL
			FASTED : OVERNIGHT
		08683	TERMINAL KILL
			FASTED : OVERNIGHT
		08684	TERMINAL KILL
			FASTED : OVERNIGHT
		08685	TERMINAL KILL
			FASTED : OVERNIGHT
		08686	TERMINAL KILL
			FASTED : OVERNIGHT
		08687	TERMINAL KILL
			FASTED : OVERNIGHT
		08688	TERMINAL KILL
			FASTED : OVERNIGHT
		08689	TERMINAL KILL
			FASTED : OVERNIGHT
	FEMALE	08755	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08756	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08757	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08758	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08759	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08760	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08761	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
		08762	FASTED : OVERNIGHT
			BLOOD SUBMITTED FOR CHEM AND HEMOGRAM
			TERMINAL KILL
			FASTED : OVERNIGHT
		08763	TERMINAL KILL
			FASTED : OVERNIGHT
		08764	TERMINAL KILL
			FASTED : OVERNIGHT
		08765	TERMINAL KILL
			FASTED : OVERNIGHT
		08766	TERMINAL KILL
			FASTED : OVERNIGHT
		08767	TERMINAL KILL

TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1073415

WEEK NO. ** DOSE GROUP/SEX *	ANIMAL NUMBER	OBSERVATIONS : QUALIFIER ***** COMMENTS **********
013 3000 PPM FEMALE		FASTED : OVERNIGHT
	08768	TERMINAL KILL
		FASTED : OVERNIGHT
	08769	TERMINAL KILL
		FASTED : OVERNIGHT
	08770	TERMINAL KILL
		FASTED : OVERNIGHT
	08771	TERMINAL KILL
		FASTED : OVERNIGHT
	08772	TERMINAL KILL
		FASTED : OVERNIGHT
	08773	TERMINAL KILL
		FASTED : OVERNIGHT
	08774	TERMINAL KILL
		FASTED : OVERNIGHT
014 0 PPM MALE	08610	TERMINAL KILL
		FASTED : OVERNIGHT
	08611	TERMINAL KILL
		FASTED : OVERNIGHT
	08612	TERMINAL KILL
		FASTED : OVERNIGHT
	08613	TERMINAL KILL
		FASTED : OVERNIGHT
	08614	TERMINAL KILL
		FASTED : OVERNIGHT
	08615	TERMINAL KILL
		FASTED : OVERNIGHT
	08616	TERMINAL KILL
		FASTED : OVERNIGHT
FEMALE	08695	TERMINAL KILL
		FASTED : OVERNIGHT
	08696	TERMINAL KILL
		FASTED : OVERNIGHT
	08697	TERMINAL KILL
		FASTED : OVERNIGHT
	08698	TERMINAL KILL
		FASTED : OVERNIGHT
	08699	TERMINAL KILL
		FASTED : OVERNIGHT
	08700	TERMINAL KILL
		FASTED : OVERNIGHT
	08701	TERMINAL KILL
		FASTED : OVERNIGHT

TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1C73415

WEEK NO. **	DOSE GROUP/SEX *	ANIMAL NUMBER	***** OBSERVATIONS : QUALIFIER COMMENTS **********
014	300 PPM MALE	08630	TERMINAL KILL FASTED : OVERNIGHT
		08631	TERMINAL KILL FASTED : OVERNIGHT
		08632	TERMINAL KILL FASTED : OVERNIGHT
		08633	TERMINAL KILL FASTED : OVERNIGHT
		08634	TERMINAL KILL FASTED : OVERNIGHT
		08635	TERMINAL KILL FASTED : OVERNIGHT
	FEMALE	08715	TERMINAL KILL FASTED : OVERNIGHT
		08716	TERMINAL KILL FASTED : OVERNIGHT
		08717	TERMINAL KILL FASTED : OVERNIGHT
		08718	TERMINAL KILL FASTED : OVERNIGHT
		08719	TERMINAL KILL FASTED : OVERNIGHT
		08720	TERMINAL KILL FASTED : OVERNIGHT
		08721	TERMINAL KILL FASTED : OVERNIGHT
	1000 PPM MALE	08650	TERMINAL KILL FASTED : OVERNIGHT
		08651	TERMINAL KILL FASTED : OVERNIGHT
		08652	TERMINAL KILL FASTED : OVERNIGHT
		08653	TERMINAL KILL FASTED : OVERNIGHT
		08654	TERMINAL KILL FASTED : OVERNIGHT
		08655	TERMINAL KILL FASTED : OVERNIGHT
		08656	TERMINAL KILL FASTED : OVERNIGHT
	FEMALE	08735	TERMINAL KILL FASTED : OVERNIGHT
		08736	TERMINAL KILL FASTED : OVERNIGHT

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TABLE H-13 (CONTINUED)
CLINICAL SIGNS
PROJECT NUMBER - 1073415

WEEK NO. ** DOSE GROUP/SEX *	ANIMAL NUMBER	***** OBSERVATIONS : QUALIFIER COMMENTS **********
014 1000 PPM FEMALE	08737	TERMINAL KILL FASTED : OVERNIGHT
	08738	TERMINAL KILL FASTED : OVERNIGHT
	08739	TERMINAL KILL FASTED : OVERNIGHT
	08740	TERMINAL KILL FASTED : OVERNIGHT
3000 PPM MALE	08670	TERMINAL KILL FASTED : OVERNIGHT
	08671	TERMINAL KILL FASTED : OVERNIGHT
	08672	TERMINAL KILL FASTED : OVERNIGHT
	08673	TERMINAL KILL FASTED : OVERNIGHT
	08674	TERMINAL KILL FASTED : OVERNIGHT
	08675	TERMINAL KILL FASTED : OVERNIGHT
	08676	TERMINAL KILL FASTED : OVERNIGHT
FEMALE	08755	TERMINAL KILL FASTED : OVERNIGHT
	08756	TERMINAL KILL FASTED : OVERNIGHT
	08757	TERMINAL KILL FASTED : OVERNIGHT
	08758	TERMINAL KILL FASTED : OVERNIGHT
	08759	TERMINAL KILL FASTED : OVERNIGHT
	08760	TERMINAL KILL FASTED : OVERNIGHT
	08761	TERMINAL KILL FASTED : OVERNIGHT

TABLE H-14
PROJECT NO. 1073415
COMPUTER GROUP NO: 169A
LITTON BIONETICS, INC.
BODY WEIGHT IN GRAMS
GROUP 1 MALES DOSE: 0 PPM

ANML NO.	DATES OF TESTING (1980-1981) 10/23	10/30	11/ 6	11/13	11/20	11/26	12/ 4	12/11	12/18	12/24	12/31	1/ 8	1/15
	0	1	2	3	4	5	6	7	8	9	10	11	12
8610	244.2	301.5	338.9	375.0	395.9	404.9	439.8	451.4	461.6	475.1	494.1	505.5	519.4
8611	236.5	286.9	316.6	355.4	365.5	383.3	406.4	418.1	422.2	444.6	451.9	464.8	478.4
8612	223.3	273.6	317.9	346.5	360.5	382.2	418.8	431.7	445.0	469.7	483.1	491.3	504.0
8613	220.9	269.2	301.3	327.7	357.5	373.9	409.2	419.2	431.6	457.9	460.2	482.2	493.6
8614	262.8	316.6	352.6	382.6	393.9	417.0	446.6	452.5	463.9	485.5	498.9	515.5	521.4
8615	218.3	250.0	278.1	295.0	302.6	316.7	335.3	340.9	354.5	364.6	376.5	398.3	400.1
8616	247.0	280.8	311.5	340.8	353.7	367.2	391.8	407.6	420.6	424.6	434.6	452.8	454.4
8617	245.7	290.9	329.6	361.5	372.4	391.0	411.9	427.4	444.6	459.4	468.7	481.4	492.1
8618	259.1	296.7	330.9	357.5	385.8	402.6	433.0	438.9	463.4	478.7	492.6	506.3	524.2
8619	252.2	300.6	330.6	360.6	384.8	405.5	420.2	427.0	442.0	469.4	476.6	497.2	494.4
8620	221.0	268.1	302.0	336.7	359.6	375.8	402.1	412.1	439.6	450.1	463.2	475.3	487.8
8621	244.2	286.5	319.7	345.1	380.9	399.5	427.5	430.3	455.6	461.7	489.0	504.4	517.2
8622	260.5	306.3	343.0	369.9	401.5	395.6	427.1	432.0	454.6	473.7	484.0	489.5	498.4
8623	234.3	282.6	318.7	339.4	368.6	386.6	407.9	419.6	433.9	449.7	461.6	479.8	485.8
8624	262.1	312.6	349.4	371.1	408.4	419.3	446.0	450.3	479.2	492.6	502.3	517.2	525.8
8625	210.7	253.4	279.6	307.5	332.9	344.2	377.5	386.5	384.7	395.2	398.6	417.9	428.7
8626	257.8	313.1	339.4	373.4	389.4	393.5	420.5	425.1	451.4	454.3	461.5	469.7	481.6
8627	267.5	307.9	345.4	372.0	413.0	419.4	445.5	455.0	474.1	496.4	505.6	519.7	536.2
8628	252.6	293.5	323.8	343.9	375.2	387.2	416.8	431.3	456.0	465.5	476.9	483.7	493.2
8629	236.6	271.2	306.1	335.8	355.0	375.5	399.9	412.5	424.0	433.4	451.3	465.4	480.5
SAMPLE	20	20	20	20	20	20	20	20	20	20	20	20	20
MEAN	242.6	288.1	321.8	349.9	372.9	387.0	414.2	423.5	440.1	455.1	466.6	480.9	491.1
S.D.	16.8	19.5	21.1	22.8	26.3	25.0	26.2	25.8	29.6	31.9	33.2	31.2	33.4
S.E.	3.8	4.4	4.7	5.1	5.9	5.6	5.9	5.8	6.6	7.1	7.4	7.0	7.5

TABLE H-14 (CONTINUED)
PROJECT NO. 1073415
COMPUTER GROUP NO: 169B
LITTON BIONETICS, INC.
BODY WEIGHT IN GRAMS
GROUP 1 FEMALES DOSE: 0 PPM

ANML NO.	DATES OF TESTING (1980-1981) 10/23	10/30	11/ 6	11/13	11/20	11/26	12/ 4	12/11	12/18	12/24	12/31	1/ 8	1/15
	0	1	2	3	4	5	6	7	8	9	10	11	12
8695	174.4	187.2	209.3	213.6	233.2	233.0	241.9	240.2	257.8	253.4	265.6	266.7	263.7
8696	153.1	173.0	177.0	186.9	198.8	196.6	212.7	209.9	225.4	247.2	232.1	240.5	240.6
8697	168.8	188.9	200.8	220.0	225.1	233.9	258.5	251.6	262.4	265.8	279.2	286.2	284.1
8698	162.2	184.8	211.2	219.8	228.1	244.1	245.2	258.6	256.5	246.6	275.5	286.3	298.9
8699	177.2	209.8	215.6	233.6	231.0	243.5	250.1	257.9	260.0	263.9	276.1	285.1	291.1
8700	200.2	237.6	250.8	266.4	265.5	278.3	294.6	289.4	302.6	299.1	319.1	319.8	322.4
8701	159.7	175.5	175.4	177.9	186.3	195.9	206.9	214.0	219.5	231.8	240.9	245.9	244.0
8702	162.7	175.1	186.3	195.3	199.3	207.8	218.1	215.5	228.6	249.8	227.0	245.1	239.1
8703	170.9	195.9	201.6	217.9	234.0	203.5	249.0	237.6	246.7	252.0	250.6	260.0	261.7
8704	185.3	191.1	208.4	214.0	224.8	227.9	235.4	239.4	248.1	260.3	253.1	262.3	266.1
8705	167.0	190.1	189.6	203.2	213.6	210.3	219.3	223.8	228.5	234.6	238.5	247.7	246.9
8706	173.8	186.1	205.4	218.3	217.3	220.9	237.6	229.2	240.3	241.7	253.3	262.5	254.4
8707	165.2	178.0	197.1	197.8	213.3	212.3	218.5	222.7	237.4	232.3	234.8	249.3	247.4
8708	176.4	182.7	212.0	211.1	228.4	223.1	239.1	234.7	241.9	253.5	253.5	260.8	265.1
8709	177.7	188.9	196.5	203.4	206.7	215.6	231.0	233.0	227.1	246.2	254.3	259.2	253.5
8710	160.0	188.1	203.6	219.3	214.2	233.1	239.6	237.3	240.9	246.4	251.0	264.2	265.6
8711	153.9	167.6	178.4	182.9	193.9	197.7	213.6	205.3	213.7	218.3	220.7	222.0	222.9
8712	154.2	166.2	181.9	181.2	203.9	208.2	211.0	209.8	223.9	220.8	228.4	226.5	228.8
8713	180.5	190.6	208.4	209.8	215.5	219.4	231.4	238.2	243.8	240.2	245.6	249.2	248.1
8714	167.6	190.0	192.1	211.9	218.6	215.6	231.8	231.7	244.7	244.7	259.6	247.2	254.4
SAMPLE	20	20	20	20	20	20	20	20	20	20	20	20	20
MEAN	169.5	187.4	200.1	209.2	217.6	221.0	234.3	234.0	242.5	247.4	252.9	259.3	259.4
S.D.	11.7	15.6	17.3	20.2	17.6	19.9	20.4	20.1	19.8	17.5	22.7	22.4	23.6
S.E.	2.6	3.5	3.9	4.5	3.9	4.4	4.6	4.5	4.4	3.9	5.1	5.0	5.3

TABLE H-14 (CONTINUED)
PROJECT NO. 1073415
COMPUTER GROUP NO: 169C
LITTON BIONETICS, INC.
BODY WEIGHT IN GRAMS
GROUP 2 MALES DOSE: 300 PPM

ANML NO.	DATES OF TESTING (1980-1981) 10/23	10/30	11/ 6	11/13	11/20	11/26	12/ 4	12/11	12/18	12/24	12/31	1/ 8	1/15
	0	1	2	3	4	5	6	7	8	9	10	11	12
8630	259.3	299.9	339.2	369.5	378.3	397.7	429.3	442.6	454.2	470.6	493.7	494.2	523.4
8631	241.7	282.8	310.8	339.2	342.0	361.6	396.8	410.5	415.5	442.2	447.6	473.2	477.9
8632	249.6	296.0	327.1	362.7	370.7	401.3	428.7	431.7	448.0	470.1	487.6	501.4	512.3
8633	234.8	274.9	311.1	344.1	349.3	373.4	394.9	413.8	443.0	454.9	459.0	472.2	484.4
8634	256.3	310.0	333.4	363.7	384.1	395.1	421.8	432.7	443.7	457.5	470.3	479.1	499.4
8635	238.8	288.4	323.0	353.4	365.1	385.5	405.9	416.6	430.0	451.3	460.2	473.3	486.8
8636	256.8	300.7	327.8	360.8	373.5	392.3	418.3	432.6	445.6	471.0	482.1	496.6	515.0
8637	223.1	260.0	281.4	301.3	314.0	336.8	363.4	371.5	374.8	390.8	406.8	421.7	435.2
8638	248.1	294.1	329.4	360.7	378.9	391.9	413.0	419.3	442.3	458.0	475.7	476.7	491.0
8639	234.7	286.6	326.4	361.5	389.8	408.7	431.8	441.7	463.0	479.1	498.0	510.3	527.4
8640	212.5	249.9	280.7	305.5	327.8	336.0	366.9	371.9	390.6	403.4	411.0	422.6	436.2
8641	274.3	326.1	360.3	389.1	427.2	442.1	473.9	472.2	515.4	519.8	530.7	547.2	559.5
8642	210.5	259.0	286.2	312.5	331.0	344.7	367.6	372.8	385.3	413.1	420.3	428.8	441.0
8643	275.5	323.8	353.5	382.4	412.4	427.0	450.0	455.3	490.3	485.3	520.5	538.5	557.0
8644	222.3	253.5	269.5	280.1	297.4	306.0	320.6	328.7	344.0	354.2	365.9	383.8	382.3
8645	247.1	291.0	332.3	364.7	387.9	402.2	426.0	433.6	459.5	478.6	490.2	494.4	514.2
8646	250.3	295.6	331.7	370.7	388.2	397.6	418.2	425.7	440.6	454.8	463.2	476.3	491.7
8647	237.5	285.3	313.8	334.6	353.2	372.0	395.3	402.2	418.9	432.7	444.4	462.0	472.9
8648	272.0	322.2	359.6	381.2	414.5	423.3	449.6	453.8	458.1	489.9	498.7	502.7	512.2
8649	239.8	283.4	309.0	340.2	356.3	377.5	402.5	409.0	427.2	436.9	454.4	464.8	476.4
SAMPLE	20	20	20	20	20	20	20	20	20	20	20	20	20
MEAN	244.2	289.2	320.3	348.9	367.1	383.6	408.7	416.9	434.5	450.7	464.0	476.0	489.3
S.D.	18.7	22.2	25.6	29.4	33.8	33.7	35.2	34.3	39.3	38.1	40.4	39.4	42.8
S.E.	4.2	5.0	5.7	6.6	7.6	7.5	7.9	7.7	8.8	8.5	9.0	8.8	9.6

TABLE H-14 (CONTINUED)
PROJECT NO. 1073415
COMPUTER GROUP NO: 169D
LITTON BIONETICS, INC.
BODY WEIGHT IN GRAMS
GROUP 2 FEMALES DOSE: 300 PPM

ANML NO.	DATES OF TESTING (1980-1981) 10/23	10/30	11/ 6	11/13	11/20	11/26	12/ 4	12/11	12/18	12/24	12/31	1/ 8	1/15
	0	1	2	3	4	5	6	7	8	9	10	11	12
8715	162.0	173.3	196.1	201.5	200.8	208.4	222.3	224.4	234.1	247.0	249.5	262.4	257.4
8716	164.5	182.3	185.3	210.9	213.0	215.7	225.8	236.1	241.4	238.5	252.4	264.1	265.7
8717	192.1	200.9	206.3	220.1	229.7	228.4	249.3	242.1	258.4	257.6	264.7	273.5	272.8
8718	184.2	210.4	224.9	234.8	249.5	250.7	272.6	268.2	281.7	287.1	297.4	299.7	300.7
8719	182.2	199.2	205.8	228.0	220.7	220.7	242.8	235.7	242.8	243.0	247.2	257.9	257.3
8720	168.8	196.7	198.6	212.5	226.9	232.8	232.4	231.6	237.0	243.9	254.5	256.3	260.1
8721	172.2	194.8	201.2	223.4	248.8	250.0	250.9	244.3	249.5	260.2	262.3	271.2	279.0
8722	153.3	164.8	171.6	171.8	181.8	181.8	201.0	190.2	207.2	204.2	212.0	225.3	220.9
8723	188.7	200.3	206.9	225.3	240.0	240.0	252.7	246.8	257.7	262.4	266.1	273.3	273.9
8724	159.7	171.1	183.7	190.5	196.7	200.8	212.5	203.5	211.8	215.0	217.3	230.3	231.4
8725	163.2	179.1	187.8	199.1	211.9	212.3	228.8	229.5	236.9	241.6	245.4	254.9	254.8
8726	186.7	212.9	238.6	248.2	252.8	258.9	271.7	274.2	278.4	291.7	298.5	309.7	317.5
8727	146.0	158.6	170.8	179.9	191.6	193.1	207.3	206.1	221.9	226.7	227.6	230.9	236.7
8728	189.9	213.1	228.6	233.7	249.2	257.1	264.0	265.6	271.0	284.0	289.1	291.2	289.0
8729	176.4	208.3	214.9	228.2	235.0	245.0	258.2	247.9	250.7	272.8	272.0	276.0	281.8
8730	195.3	212.3	231.1	246.5	260.5	266.4	287.8	284.0	296.6	302.0	307.3	317.4	324.6
8731	174.7	182.7	192.2	199.9	207.6	204.7	218.3	216.0	228.9	227.0	231.8	235.6	233.0
8732	187.1	203.6	224.8	235.3	249.4	242.4	273.8	262.1	280.0	284.7	290.9	302.0	298.7
8733	166.3	193.4	210.3	214.3	228.4	227.7	240.4	237.9	240.5	250.2	260.7	268.7	256.3
8734	189.0	211.3	228.1	229.2	247.7	249.1	268.8	255.9	267.3	271.5	279.4	286.4	287.3
SAMPLE	20	20	20	20	20	20	20	20	20	20	20	20	20
MEAN	175.1	193.5	205.4	216.7	227.1	229.3	244.1	240.1	249.7	255.6	261.3	269.3	269.9
S.D.	14.2	17.1	19.9	20.9	23.1	23.9	24.9	24.5	24.2	26.7	27.2	26.6	28.2
S.E.	3.2	3.8	4.5	4.7	5.2	5.3	5.6	5.5	5.4	6.0	6.1	5.9	6.3

TABLE H-14 (CONTINUED)
PROJECT NO. 1073415
COMPUTER GROUP NO: 169E
LITTON BIONETICS, INC.
BODY WEIGHT IN GRAMS
GROUP 3 MALES DOSE: 1000 PPM

ANML NO.	DATES OF TESTING (1980-1981) 10/23	10/30	11/ 6	11/13	11/20	11/26	12/ 4	12/11	12/18	12/24	12/31	1/ 8	1/15
	0	1	2	3	4	5	6	7	8	9	10	11	12
8650	234.7	282.6	319.8	347.7	354.0	379.3	404.2	423.1	431.8	451.4	464.0	470.3	482.0
8651	281.8	324.1	366.5	404.2	415.0	437.8	473.2	489.0	511.3	536.6	572.5	555.1	571.9
8652	247.7	293.2	317.9	351.2	353.9	373.7	390.4	411.1	399.5	413.4	430.2	439.1	446.5
8653	252.3	305.7	325.2	359.5	366.7	376.2	395.9	405.5	413.3	440.6	448.5	462.5	481.8
8654	255.6	302.6	338.7	366.3	366.1	378.1	406.1	412.2	423.1	443.6	458.5	468.7	483.1
8655	235.8	280.8	318.1	351.5	357.7	381.4	411.3	426.2	433.8	458.3	469.0	489.1	509.0
8656	266.1	323.3	364.2	392.7	378.8	410.1	444.4	461.7	487.0	515.5	526.0	550.3	569.1
8657	222.5	272.1	309.8	332.8	357.4	368.7	392.6	403.5	418.4	438.1	454.8	470.6	481.2
8658	266.3	305.9	342.3	377.5	402.5	408.0	433.3	445.3	466.2	481.1	494.7	486.3	501.2
8659	249.4	294.8	333.3	367.3	393.5	402.5	422.0	433.0	456.6	479.1	491.4	498.0	508.6
8660	265.5	307.0	341.6	361.7	381.0	396.5	414.1	425.0	437.9	449.7	467.9	480.2	482.6
8661	253.2	297.1	338.9	366.6	386.8	404.8	422.9	436.2	456.2	469.7	482.6	494.2	496.3
8662	274.3	336.1	362.5	395.9	413.9	436.6	456.3	452.7	493.9	506.0	509.9	506.5	522.8
8663	234.2	271.3	299.3	333.2	359.8	366.9	390.3	391.5	419.3	429.1	433.9	425.4	446.3
8664	267.8	326.5	368.4	398.2	412.6	429.5	442.8	465.2	476.0	503.3	506.0	513.6	521.1
8665	255.9	321.9	359.9	398.5	433.4	450.2	471.2	418.3	494.8	522.9	541.4	547.5	575.3
8666	255.1	294.8	335.5	362.8	384.6	388.7	416.1	420.3	452.3	467.5	485.3	487.3	496.8
8667	256.8	306.8	333.7	370.4	393.5	410.8	434.1	442.2	478.2	488.0	502.9	507.9	529.4
8668	257.6	305.1	352.2	385.2	411.4	425.3	450.5	465.2	491.3	492.7	514.3	527.8	533.7
8669	277.0	337.6	373.3	419.8	434.7	457.1	479.9	493.4	522.4	532.9	543.3	557.8	-
SAMPLE	20	20	20	20	20	20	20	20	20	20	20	20	19
MEAN	255.5	304.5*	340.1*	372.1*	387.9	404.1	427.6	436.0	458.2	476.0	489.9	496.9	507.2
S.D.	15.3	19.5	21.2	23.9	26.3	27.9	28.4	28.1	35.4	35.8	38.0	37.2	37.3
S.E.	3.4	4.4	4.7	5.3	5.9	6.2	6.3	6.3	7.9	8.0	8.5	8.3	8.6

*p<0.05 as compared to controls: Dunnett's t-test.

TABLE H-14 (CONTINUED)
PROJECT NO. 1073415
COMPUTER GROUP NO: 169F
LITTON BIONETICS, INC.
BODY WEIGHT IN GRAMS
GROUP 3 FEMALES DOSE: 1000 PPM

ANML NO.	DATES OF TESTING (1980-1981) 10/23	10/30	11/ 6	11/13	11/20	11/26	12/ 4	12/11	12/18	12/24	12/31	1/ 8	1/15
	0	1	2	3	4	5	6	7	8	9	10	11	12
8735	172.6	179.4	207.6	208.0	229.3	216.7	241.9	230.8	252.6	250.0	255.5	267.2	258.2
8736	173.5	192.6	202.6	216.2	226.0	220.1	239.6	233.6	238.0	244.7	249.8	256.5	265.7
8737	197.4	212.9	230.3	241.8	254.2	256.0	272.3	262.0	270.8	283.1	287.2	303.9	295.0
8738	197.5	217.0	[illegible]1	259.0	267.1	269.9	283.1	289.2	290.4	294.2	311.3	323.4	320.6
8739	176.1	184.0	[illegible]8	205.7	201.3	203.1	217.3	215.3	218.8	219.6	224.2	227.8	225.7
8740	180.5	205.7	212.4	222.2	228.3	220.5	237.9	243.7	247.3	260.1	252.3	264.6	260.2
8741	181.1	198.5	199.6	211.7	222.7	215.8	231.5	229.2	237.2	250.8	244.6	265.0	253.4
8742	161.9	177.3	204.6	214.9	224.0	232.8	246.5	243.1	250.7	271.0	272.0	280.8	286.9
8743	195.0	209.1	230.2	255.0	248.8	264.3	290.3	278.1	322.8	302.5	312.1	319.5	314.2
8744	189.4	211.3	216.5	220.5	232.1	236.0	242.7	240.9	250.5	255.6	257.1	263.7	266.3
8745	149.2	171.6	173.3	186.2	182.8	199.5	206.3	208.5	215.5	221.4	223.0	232.4	232.7
8746	183.1	197.8	215.7	224.8	242.1	241.7	260.8	253.9	275.6	275.5	281.0	287.5	286.6
8747	160.8	180.0	187.5	194.1	200.2	208.9	211.0	215.2	226.7	228.3	232.0	240.4	244.8
8748	179.5	214.3	217.6	234.1	242.0	247.3	274.3	257.4	269.9	280.0	278.0	287.5	282.7
8749	153.4	177.9	188.6	201.3	214.3	208.6	233.7	223.4	239.7	239.6	251.3	257.4	258.3
8750	172.6	184.6	204.5	216.0	227.8	232.9	245.2	243.3	262.0	264.3	277.1	276.8	271.5
8751	162.2	168.7	186.5	188.6	196.0	201.9	212.0	202.6	216.8	227.0	224.6	231.2	234.3
8752	169.1	193.3	209.6	228.9	218.7	239.5	262.6	254.1	276.6	284.4	278.2	283.9	289.2
8753	209.1	239.2	241.6	255.1	257.0	257.4	275.7	274.2	285.8	293.3	295.3	301.0	310.1
8754	167.7	186.1	199.5	203.0	235.5	225.0	230.0	241.0	244.3	252.4	250.0	264.6	260.0
SAMPLE	20	20	20	20	20	20	20	20	20	20	20	20	20
MEAN	176.6	195.1	207.9	219.4	227.5	229.9	245.7	242.0	254.6	259.9	262.8	271.8	270.8
S.D.	15.7	18.3	18.8	21.4	21.6	21.4	24.9	23.3	27.5	25.3	27.1	27.5	27.0
S.E.	3.5	4.1	4.2	4.8	4.8	4.8	5.6	5.2	6.2	5.6	6.1	6.1	6.0

TABLE H-14 (CONTINUED)
PROJECT NO. 1073415
COMPUTER GROUP NO: 1696
LITTON BIONETICS, INC.
BODY WEIGHT IN GRAMS
GROUP 4 MALES DOSE: 3000 PPM

ANML NO.	DATES OF TESTING (1980-1981) 10/23	10/30	11/ 6	11/13	11/20	11/26	12/ 4	12/11	12/18	12/24	12/31	1/ 8	1/15
	0	1	2	3	4	5	6	7	8	9	10	11	12
8670	231.3	275.7	297.4	328.7	346.0	363.1	383.4	390.1	406.3	409.1	424.9	429.6	441.8
8671	248.5	291.0	290.9	337.3	349.6	375.9	398.1	408.7	419.3	445.7	452.8	465.8	479.5
8672	242.2	261.0	295.0	321.0	328.3	348.4	369.2	387.7	398.5	406.1	427.6	437.3	447.2
8673	250.2	300.3	332.5	366.2	381.6	408.2	428.9	450.0	461.5	485.1	497.7	508.0	531.1
8674	239.3	296.5	332.0	370.0	396.9	413.5	444.1	455.0	475.4	502.2	513.0	523.1	542.1
8675	262.2	311.0	327.8	365.1	369.0	390.9	408.5	412.6	434.9	449.2	455.7	465.3	467.7
8676	253.9	301.7	332.5	358.4	373.7	391.1	409.7	421.9	446.9	458.7	477.0	476.0	503.4
8677	254.5	298.4	321.9	351.9	352.8	365.7	392.7	398.8	394.6	401.7	417.2	438.1	455.4
8678	245.7	285.8	316.0	348.6	371.0	390.6	411.6	425.0	435.5	446.6	464.3	465.5	486.9
8679	238.7	275.7	315.3	336.5	361.7	368.8	390.9	389.9	408.9	423.9	427.4	446.1	456.4
8680	229.0	265.8	293.5	319.5	340.1	351.4	370.5	375.4	401.4	410.2	396.6	412.4	426.1
8681	236.1	275.3	308.1	329.9	361.4	365.6	394.1	395.5	418.8	435.6	447.0	465.0	469.9
8682	227.3	274.7	311.2	335.6	370.4	378.9	408.3	415.9	437.2	448.1	459.9	466.1	478.1
8683	226.9	270.2	304.5	326.1	352.9	367.0	389.4	387.9	414.8	434.4	451.7	461.2	475.1
8684	189.0	227.1	259.1	280.2	307.5	318.8	345.5	353.2	368.0	391.5	401.1	410.9	420.1
8685	207.6	246.7	279.1	303.4	318.9	333.0	346.8	347.3	382.1	385.1	394.4	396.8	408.0
8686	232.0	266.6	303.9	324.7	345.2	362.8	381.1	400.9	401.0	407.4	417.9	433.6	443.8
8687	232.4	272.6	306.5	334.5	354.6	368.1	386.0	389.0	418.6	430.7	442.2	444.0	454.7
8688	258.2	305.5	348.6	379.6	409.9	423.0	448.2	460.2	485.6	506.0	511.8	527.6	540.9
8689	213.4	250.5	273.8	295.1	310.7	323.8	339.0	349.8	354.9	368.2	377.5	388.3	390.4
SAMPLE	20	20	20	20	20	20	20	20	20	20	20	20	20
MEAN	235.9	277.6	307.5	335.6	355.1	370.4	392.3	400.7	418.2	432.3	442.9	453.0*	465.9
S.D.	18.0	21.7	22.2	25.6	26.4	27.8	29.7	32.0	33.3	37.1	38.1	37.8	41.3
S.E.	4.0	4.8	5.0	5.7	5.9	6.2	6.6	7.2	7.4	8.3	8.5	8.5	9.2

*p<0.05 as compared to controls: Dunnett's t-test.

TABLE H-14 (CONTINUED)
PROJECT NO. 1073415
COMPUTER GROUP NO: 169H
LITTON BIONETICS, INC.
BODY WEIGHT IN GRAMS
GROUP 4 FEMALES DOSE: 3000 PPM

ANML NO.	DATES OF TESTING (1980-1981) 10/23	10/30	11/ 6	11/13	11/20	11/26	12/ 4	12/11	12/18	12/24	12/31	1/ 8	1/15
	0	1	2	3	4	5	6	7	8	9	10	11	12
8755	147.2	167.2	175.1	176.7	184.7	182.2	197.5	188.8	201.7	200.4	201.3	219.2	211.3
8756	187.7	200.0	212.0	224.6	230.6	242.7	253.3	250.9	260.6	268.6	275.0	295.7	296.9
8757	171.9	194.2	200.4	218.3	228.1	236.4	246.8	249.2	255.1	266.2	264.5	273.7	275.1
8758	158.9	179.0	182.5	185.1	195.0	203.7	210.5	210.2	220.8	231.0	236.2	233.2	233.8
8759	158.0	172.4	186.6	202.2	205.3	207.4	227.4	219.2	232.6	238.4	240.4	256.8	246.7
8760	181.3	195.7	206.6	225.0	218.0	230.8	244.3	243.4	249.2	256.8	266.8	268.3	267.8
8761	190.2	210.5	213.1	231.4	229.5	238.0	248.0	252.3	256.3	260.8	261.6	274.1	275.3
8762	173.7	188.2	213.8	215.9	222.0	243.1	242.2	249.6	245.5	254.8	263.2	275.7	269.6
8763	179.6	197.7	202.2	217.5	218.0	222.4	225.3	235.7	266.4	238.0	240.1	249.2	247.7
8764	201.2	203.4	225.1	233.9	242.0	250.9	259.1	251.0	255.9	263.9	262.6	270.9	264.6
8765	145.4	150.9	166.3	171.8	183.5	186.8	198.0	188.6	206.4	207.0	209.9	221.2	217.9
8766	178.6	194.5	210.3	214.8	223.2	218.7	238.9	241.1	252.0	261.9	266.5	272.5	274.7
8767	149.0	167.9	176.1	184.4	191.8	195.1	206.8	201.5	216.1	213.4	217.6	213.7	226.4
8768	157.0	172.5	186.5	192.5	191.8	197.5	201.6	199.1	209.5	220.1	217.3	226.6	219.4
8769	157.9	181.8	187.2	193.7	213.7	168.0	225.9	217.0	240.2	233.7	237.9	241.7	247.2
8770	180.9	190.5	209.3	215.5	224.3	230.5	241.4	241.4	250.7	252.6	258.7	271.8	271.6
8771	181.2	188.5	216.5	223.5	239.2	236.2	242.9	251.3	257.4	257.7	258.7	269.2	262.0
8772	177.7	192.3	197.2	196.7	205.3	213.8	224.5	227.2	235.2	242.3	244.1	248.7	251.3
8773	164.2	174.6	187.1	193.5	202.9	207.4	201.3	202.9	216.3	211.4	217.0	219.0	225.5
8774	174.8	201.1	230.5	240.0	252.6	255.2	275.2	266.8	283.6	290.9	302.3	307.5	311.6
SAMPLE	20	20	20	20	20	20	20	20	20	20	20	20	20
MEAN	170.8	186.1	199.2	207.8	215.1	218.3	230.5	229.4	240.6	243.5	247.1	255.4	254.8
S.D.	15.4	14.9	17.6	20.0	19.6	24.3	22.3	24.1	22.4	24.1	25.5	26.9	27.0
S.E.	3.4	3.3	3.9	4.5	4.4	5.4	5.0	5.4	5.0	5.4	5.7	6.0	6.0

TABLE H-15
PROJECT NO. 1073415
COMPUTER GROUP NO: 165A
LITTON BIONETICS, INC.
DAILY FOOD INTAKE IN GRAMS
GROUP 1 MALES DOSE: 0 PPM

ANML	DATES OF TESTING (1980-1981)											
NO.	10/30	11/ 6	11/13	11/20	11/26	12/ 4	12/11	12/18	12/24	12/31	1/ 8	1/15
	1	2	3	4	5	6	7	8	9	10	11	12
A610	23.3	24.6	25.4	-	23.6	24.7	24.4	-	24.5	24.4	24.0	24.7
A611	22.5	23.0	24.0	-	21.6	22.1	20.6	-	21.3	20.7	20.7	21.3
A612	21.5	23.3	23.0	-	22.4	23.4	24.7	-	23.8	24.5	23.5	23.8
A613	21.6	22.8	23.8	-	23.4	25.3	25.4	-	25.9	25.2	25.6	26.4
A614	23.1	24.2	23.9	-	25.0	24.1	24.5	-	24.0	24.1	23.4	24.3
A615	19.9	21.8	19.3	-	19.0	19.5	19.2	-	20.4	20.2	20.0	20.6
A616	23.3	23.0	23.0	-	20.8	21.5	22.4	-	20.7	21.9	21.6	22.0
A617	24.6	25.3	23.9	-	22.3	23.2	23.4	-	23.6	22.8	22.8	22.6
A618	22.1	22.0	21.3	21.1	20.7	23.3	23.4	22.9	24.0	24.3	23.8	24.1
A619	21.5	22.4	21.1	21.4	20.9	21.4	21.8	20.9	22.7	22.5	22.1	22.6
A620	21.4	21.8	21.6	22.0	20.6	21.7	22.6	22.9	22.7	23.8	22.5	23.7
A621	22.1	22.7	20.3	22.6	20.6	23.5	21.5	22.1	25.8	24.1	23.5	24.0
A622	23.8	24.7	24.6	24.3	23.3	24.0	23.9	22.1	24.5	23.4	22.7	22.9
A623	21.7	21.7	21.8	22.5	21.5	22.6	22.5	21.4	21.8	22.0	21.7	22.1
A624	23.9	24.1	24.2	25.2	23.0	24.3	24.9	24.2	25.1	24.8	23.5	25.3
A625	22.6	21.4	21.6	22.8	20.9	22.7	22.1	20.6	18.5	23.1	-	22.4
A626	25.1	25.2	25.8	23.5	22.0	22.9	24.0	24.6	23.3	23.4	23.5	23.8
A627	23.7	23.9	24.0	23.7	23.3	23.4	23.7	23.8	24.9	25.9	23.9	24.5
A628	26.0	26.4	25.8	25.4	26.0	22.9	23.8	22.9	24.3	26.1	23.6	23.5
A629	21.8	23.3	22.5	22.9	21.3	22.4	24.0	23.0	22.5	23.3	23.4	23.2
SAMPLE	20	20	20	12	20	20	20	12	20	20	19	20
MEAN	22.8	23.4	23.0	23.1	22.1	22.9	23.1	22.6	23.2	23.5	22.9	23.4
S.D.	1.5	1.4	1.8	1.4	1.7	1.3	1.5	1.2	1.9	1.5	1.3	1.4
S.E.	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.3

TABLE H-15 (CONTINUED)
PROJECT NO. 1073415
COMPUTER GROUP NO: 1698
LITTON BIONETICS, INC.
DAILY FOOD INTAKE IN GRAMS
GROUP 1 FEMALES DOSE: 0 PPM

ANML	DATES OF TESTING (1980-1981)											
NO.	10/30	11/ 6	11/13	11/20	11/26	12/ 4	12/11	12/18	12/24	12/31	1/ 8	1/15
	1	2	3	4	5	6	7	8	9	10	11	12
8695	14.0	16.3	15.8	-	15.0	16.2	15.2	-	16.2	16.8	17.3	15.9
8696	15.9	14.9	14.3	-	11.8	14.3	14.0	-	14.9	14.7	14.9	14.5
8697	16.2	16.1	16.7	-	17.4	17.7	17.0	-	16.6	18.5	18.5	17.8
8698	17.7	18.3	18.6	-	18.9	17.4	15.9	-	13.4	18.2	18.9	18.9
8699	17.5	17.0	17.2	-	16.0	17.4	17.9	-	17.3	17.8	17.2	17.1
8700	19.3	19.4	18.4	-	19.2	18.8	18.4	-	17.9	19.8	19.4	17.6
8701	16.1	15.3	13.0	-	15.0	15.4	15.9	-	16.9	16.6	16.1	15.1
8702	15.6	15.9	16.3	-	14.7	15.8	14.3	-	14.6	14.0	16.2	14.5
8703	20.5	16.9	17.7	16.9	15.2	18.7	15.1	14.5	16.7	14.4	18.2	14.1
8704	16.4	17.1	15.7	15.3	14.4	15.2	15.2	15.8	16.7	15.4	15.7	16.2
8705	16.0	15.2	14.8	14.8	14.1	14.8	15.7	14.6	15.2	14.9	16.3	15.5
8706	15.2	16.6	16.5	16.3	14.9	16.0	15.8	15.7	15.8	16.6	17.0	16.0
8707	14.6	16.2	14.6	15.2	13.1	14.4	14.4	14.2	13.8	13.6	14.7	14.9
8708	14.8	16.7	15.4	15.9	12.8	15.4	14.4	14.6	15.5	14.8	15.5	14.9
8709	15.8	16.1	15.4	15.2	14.4	15.4	16.1	16.4	15.6	15.4	16.5	14.7
8710	17.7	16.3	16.9	14.9	15.1	14.8	14.1	13.6	14.8	14.0	16.0	14.6
8711	15.0	14.9	13.9	15.2	13.2	15.3	12.5	13.7	12.8	13.7	14.4	13.1
8712	14.3	14.9	13.2	15.5	13.7	14.0	14.3	14.6	13.3	14.2	14.3	13.8
8713	14.9	16.1	15.1	15.1	14.2	14.8	16.3	14.9	14.4	15.7	16.1	14.5
8714	17.8	14.4	16.1	15.6	13.8	14.8	17.3	14.8	15.7	15.5	15.4	15.4
SAMPLE	20	20	20	12	20	20	20	12	20	20	20	20
MEAN	16.3	16.2	15.8	15.5	14.8	15.8	15.5	14.8	15.4	15.7	16.4	15.5
S.D.	1.7	1.2	1.6	0.6	1.9	1.4	1.4	0.8	1.4	1.8	1.5	1.5
S.E.	0.4	0.3	0.3	0.2	0.4	0.3	0.3	0.2	0.3	0.4	0.3	0.3

TABLE H-15 (CONTINUED)
PROJECT NO. 1073415
COMPUTER GROUP NO: 169C
LITTON BIONETICS, INC.
DAILY FOOD INTAKE IN GRAMS
GROUP 2 MALES DOSE: 300 PPM

ANML NO.	DATES OF TESTING (1980-1981) 10/30	11/ 6	11/13	11/20	11/26	12/ 4	12/11	12/18	12/24	12/31	1/ 8	1/15
	1	2	3	4	5	6	7	8	9	10	11	12
8630	24.0	24.5	23.5	-	22.6	23.1	23.9	-	24.1	22.1	22.2	23.2
8631	22.8	19.9	21.5	-	21.2	22.7	23.1	-	24.4	21.7	23.0	22.1
8632	24.5	23.8	24.7	-	23.8	24.0	24.9	-	26.3	25.3	24.8	25.3
8633	22.0	-	24.5	-	23.1	23.5	24.0	-	25.7	23.0	23.9	24.8
8634	25.0	23.3	24.1	-	23.8	24.1	23.9	-	25.5	24.0	23.6	24.6
8635	23.8	24.1	24.2	-	24.0	23.2	23.7	-	25.7	23.4	23.4	24.1
8636	24.1	23.4	24.3	-	24.2	-	-	-	26.4	24.2	24.3	25.5
8637	20.9	20.9	19.6	-	20.5	21.1	22.2	-	24.8	21.9	23.2	24.2
8638	22.1	23.9	22.9	22.9	22.3	23.9	23.4	22.6	24.6	24.1	22.4	22.2
8639	22.7	21.9	22.5	22.4	21.6	22.3	23.1	21.6	23.6	23.6	23.2	24.5
8640	22.5	22.6	21.9	22.0	20.1	21.7	22.1	20.3	23.4	21.5	22.2	22.0
8641	27.9	25.3	24.9	25.6	24.9	23.8	24.5	24.6	25.2	24.4	24.4	24.9
8642	21.0	-	20.3	22.6	19.7	20.4	20.6	20.7	22.1	20.9	20.6	22.1
8643	-	-	24.2	24.4	24.9	25.1	26.6	26.6	28.8	-	-	27.2
8644	19.5	17.3	17.0	16.8	16.6	16.0	17.3	17.1	18.8	18.1	19.0	18.2
8645	24.3	24.8	24.5	22.5	23.1	22.4	23.2	23.1	25.2	23.3	22.6	25.0
8646	24.6	24.1	25.2	25.3	23.7	23.7	22.5	21.3	23.2	21.7	22.6	22.3
8647	21.8	21.7	20.7	19.9	19.9	19.5	20.6	20.4	22.4	22.0	22.0	22.1
8648	26.9	25.3	25.4	24.3	22.3	23.4	23.1	23.1	26.3	24.2	23.4	24.1
8649	24.3	23.9	24.4	22.1	23.5	22.6	23.2	23.0	25.0	24.0	22.6	24.6
SAMPLE	19	17	20	12	20	19	19	12	20	19	19	20
MEAN	23.4	23.0	23.0	22.6	22.2	22.4	22.9	22.0	24.6	22.8	22.8	23.6
S.D.	2.0	2.1	2.2	2.4	2.1	2.1	1.9	2.4	2.0	1.7	1.4	1.9
S.E.	0.5	0.5	0.5	0.7	0.5	0.5	0.4	0.7	0.5	0.4	0.3	0.4

SGS

TABLE H-15 (CONTINUED)
PROJECT NO. 1073415
COMPUTER GROUP NO: 1690
LITTON BIONETICS, INC.
DAILY FOOD INTAKE IN GRAMS
GROUP 2 FEMALES DOSE: 300 PPM

ANML NO.	DATES OF TESTING (1980-1981) 10/30	11/ 6	11/13	11/20	11/26	12/ 4	12/11	12/18	12/24	12/31	1/ 8	1/15
	1	2	3	4	5	6	7	8	9	10	11	12
8715	16.2	18.6	16.1	-	31.2	16.0	16.1	-	17.7	18.1	17.9	16.2
8716	16.3	16.5	17.4	-	14.9	15.5	16.0	-	15.2	15.9	16.8	15.0
8717	16.2	15.6	17.1	-	13.2	18.2	16.3	-	16.8	17.1	17.5	16.7
8718	17.7	18.0	18.0	-	15.7	17.6	16.9	-	16.3	17.3	17.3	16.1
8719	16.2	16.2	16.9	-	14.3	15.2	13.9	-	14.2	15.0	15.7	14.9
8720	19.0	21.0	16.2	-	20.5	15.5	15.0	-	16.1	16.3	15.9	16.1
8721	16.8	14.8	16.5	-	16.5	15.5	15.6	-	16.5	15.5	15.2	16.4
8722	16.1	15.7	13.7	-	15.5	-	14.2	-	16.1	15.3	15.3	15.0
8723	17.8	15.4	16.1	16.2	13.5	14.5	14.8	14.2	14.7	14.8	15.0	15.8
8724	14.3	13.8	14.0	13.0	12.3	12.7	12.4	12.5	12.9	12.5	13.8	13.4
8725	16.0	15.9	16.6	16.1	14.3	16.3	15.3	14.7	15.5	15.6	16.4	15.6
8726	19.1	19.6	18.9	18.6	17.7	19.2	18.9	17.9	19.1	19.1	20.6	20.3
8727	14.8	14.9	14.6	15.5	13.1	15.4	14.9	15.2	16.4	15.3	16.0	15.3
8728	17.5	17.6	17.9	18.4	16.2	16.9	17.8	16.9	17.0	17.4	16.8	17.3
8729	22.1	16.9	17.1	16.2	16.3	15.4	15.9	13.8	17.1	14.9	15.3	14.7
8730	16.5	17.8	17.1	17.7	16.3	17.8	17.0	17.4	19.0	18.6	19.7	20.1
8731	21.0	18.8	17.6	15.1	13.5	14.3	15.4	14.7	14.1	14.0	13.9	14.0
8732	17.4	18.0	18.4	18.0	16.2	18.0	17.0	17.1	16.9	17.7	18.4	16.1
8733	18.5	17.8	16.9	16.9	15.4	16.1	16.4	18.3	15.1	16.5	17.7	14.9
8734	20.1	20.6	18.4	18.9	16.7	-	17.6	18.6	17.7	18.7	19.1	17.8
SAMPLE	20	20	20	12	20	18	20	12	20	20	20	20
MEAN	17.5	17.2	16.8	16.7	16.2	16.1	15.9	15.9	16.2	16.3	16.7	16.1
S.D.	2.0	2.0	1.4	1.7	4.0	1.6	1.5	2.0	1.6	1.7	1.9	1.8
S.E.	0.4	0.4	0.3	0.5	0.9	0.4	0.3	0.6	0.4	0.4	0.4	0.4

TABLE H-15 (CONTINUED)
PROJECT NO. 1073415
COMPUTER GROUP NO: 169F
LITTON BIONETICS, INC.
DAILY FOOD INTAKE IN GRAMS
GROUP 3 MALES DOSE: 1000 PPM

ANML NO.	DATES OF TESTING (1980-1981) 10/30	11/ 6	11/13	11/20	11/26	12/ 4	12/11	12/18	12/24	12/31	1/ 8	1/15
	1	2	3	4	5	6	7	8	9	10	11	12
8650	24.0	24.3	24.6	-	25.5	24.4	25.5	-	25.1	23.9	22.6	22.3
8651	24.1	25.1	26.1	-	25.1	-	26.9	-	-	28.3	-	27.1
8652	21.8	19.7	21.6	-	21.8	20.2	20.6	-	20.7	20.6	19.9	19.8
8653	26.4	24.8	27.0	-	24.6	22.5	24.0	-	26.6	24.6	24.6	26.9
8654	25.1	24.9	25.8	-	21.1	22.6	22.5	-	24.2	22.8	22.1	22.9
8655	20.5	19.9	21.0	-	20.3	20.8	21.3	-	22.4	21.2	21.5	22.4
8656	24.4	24.8	23.7	-	20.6	23.8	25.6	-	25.7	26.0	25.9	24.1
8657	21.9	22.2	21.5	-	21.6	21.5	22.4	-	24.5	22.5	21.4	23.4
8658	26.3	24.8	23.9	23.8	23.4	22.4	23.9	22.9	24.4	23.9	21.1	23.8
8659	22.5	23.6	23.1	22.9	20.8	21.9	22.0	21.4	22.1	23.1	22.5	22.2
8660	23.2	22.8	22.9	20.8	19.7	20.2	20.6	20.0	21.5	22.1	21.0	21.2
8661	23.9	24.1	24.0	23.1	22.4	21.6	22.4	21.8	24.1	22.1	22.4	22.0
8662	25.0	24.4	25.1	24.4	24.5	24.5	26.4	25.1	25.1	24.8	24.1	22.8
8663	20.8	21.5	23.0	22.3	21.4	21.4	21.3	19.4	19.7	18.7	17.8	22.8
8664	26.8	26.9	26.3	24.4	22.5	22.1	25.3	22.8	25.4	24.2	24.1	22.7
8665	-	26.2	-	-	26.7	-	20.2	-	30.2	-	-	-
8666	22.0	22.6	22.7	22.9	20.5	21.0	20.8	21.2	21.4	22.7	21.5	22.7
8667	24.4	23.3	25.2	23.8	23.5	24.3	25.1	24.6	25.8	25.4	24.1	26.3
8668	23.8	24.6	24.9	24.9	23.8	24.0	25.9	24.8	25.7	26.7	-	25.4
8669	-	25.7	26.5	28.3	25.4	25.4	26.4	25.2	27.9	25.3	25.1	-
SAMPLE	18	20	19	11	20	18	20	11	19	19	17	18
MEAN	23.7	23.8	24.2	23.8	22.7	22.5	23.4	22.7	24.3	23.6	22.4	23.4
S.D.	1.9	1.9	1.8	1.9	2.1	1.6	2.3	2.1	2.6	2.3	2.0	1.9
S.E.	0.4	0.4	0.4	0.6	0.5	0.4	0.5	0.6	0.6	0.5	0.5	0.5

TABLE H-15 (CONTINUED)
PROJECT NO. 1073415
COMPUTER GROUP NO: 169F
LITTON BIONETICS, INC.
DAILY FOOD INTAKE IN GRAMS
GROUP 3 FEMALES DOSE: 1000 PPM

ANML NO.	DATES OF TESTING (1980-1981) 10/30	11/ 6	11/13	11/20	11/26	12/ 4	12/11	12/18	12/24	12/31	1/ 8	1/15
	1	2	3	4	5	6	7	8	9	10	11	12
8735	16.6	18.0	16.6	-	14.5	16.7	15.7	-	15.7	16.4	16.2	15.8
8736	15.9	14.8	15.8	-	14.4	15.6	15.5	-	17.1	15.6	15.8	16.2
8737	18.2	18.8	19.2	-	16.2	17.4	17.0	-	18.4	18.6	18.7	16.3
8738	18.5	20.2	21.0	-	18.3	19.0	19.6	-	18.3	21.0	20.6	19.0
8739	14.9	14.5	16.1	-	14.3	-	15.8	-	14.7	13.2	14.9	14.8
8740	18.0	15.5	17.2	-	15.4	15.9	16.9	-	17.3	14.3	16.9	15.3
8741	15.8	16.2	14.4	-	14.2	15.1	16.0	-	17.5	15.7	18.6	16.4
8742	14.9	16.9	19.6	-	18.2	18.9	19.2	-	21.3	21.3	20.7	22.8
8743	17.2	16.9	19.1	16.7	19.4	18.2	18.0	20.0	17.7	18.3	17.4	15.2
8744	16.7	15.9	15.9	14.7	15.1	14.4	15.9	14.9	16.0	14.4	15.3	14.7
8745	20.6	16.2	15.9	16.0	14.7	14.8	16.4	14.4	16.2	14.7	15.8	14.8
8746	16.6	16.0	16.9	17.3	16.8	16.8	16.9	17.0	17.2	17.2	17.9	16.4
8747	15.8	14.7	14.9	14.0	13.6	13.0	14.2	14.9	14.1	15.0	14.4	15.0
8748	22.4	21.9	22.5	21.9	19.0	20.8	18.5	18.7	18.6	19.4	20.4	18.5
8749	17.2	17.7	17.5	16.4	16.6	16.5	16.5	16.2	16.2	16.8	16.1	16.5
8750	15.7	16.6	16.9	16.5	15.6	16.3	16.8	16.7	17.4	17.6	16.9	16.7
8751	15.3	14.6	15.7	14.7	15.0	14.2	15.0	14.5	15.6	14.4	15.3	14.6
8752	21.4	20.4	19.6	17.8	17.2	17.4	15.9	17.1	17.3	15.6	15.0	14.6
8753	19.9	19.2	17.8	16.9	15.7	17.0	17.4	16.4	17.6	17.4	17.8	17.9
8754	17.0	16.6	17.6	17.7	16.9	18.0	17.2	16.3	17.8	17.5	18.0	16.4
SAMPLE	20	20	20	12	20	19	20	12	20	20	20	20
MEAN	17.4	17.3	17.5*	16.7	16.1	16.6	16.7*	16.4*	17.1*	16.7	17.1	16.4
S.D.	2.2	2.6	2.1	2.0	1.7	1.9	1.4	1.7	1.6	2.2	1.9	2.0
S.E.	0.5	0.6	0.5	0.6	0.4	0.4	0.3	0.5	0.4	0.5	0.4	0.4

*p<0.05 as compared to controls: Dunnett's t-test.

TABLE H-15 (CONTINUED)
PROJECT NO. 1073415
COMPUTER GROUP NO: 165G
LITTON BIONETICS, INC.
DAILY FOOD INTAKE IN GRAMS
GROUP 4 MALES DOSE: 3000 PPM

ANML NO.	DATES OF TESTING (1980-1981) 10/30	11/ 6	11/13	11/20	11/26	12/ 4	12/11	12/18	12/24	12/31	1/ 8	1/15
	1	2	3	4	5	6	7	8	9	10	11	12
8670	23.8	20.5	20.5	-	28.9	20.7	20.8	-	21.3	20.2	20.2	21.4
8671	21.8	-	24.6	-	22.8	22.6	22.1	-	23.7	22.9	23.2	23.3
8672	22.3	22.1	20.0	-	19.8	21.0	21.7	-	22.0	22.1	21.5	22.2
8673	25.8	25.2	24.6	-	24.4	24.6	25.4	-	26.2	26.8	-	29.0
8674	24.6	24.2	25.0	-	23.8	24.8	25.7	-	26.4	24.9	25.4	25.2
8675	26.5	24.9	25.2	-	21.7	22.3	21.9	-	23.1	21.6	22.0	20.8
8676	-	22.4	22.6	-	21.4	21.9	22.7	-	23.8	23.3	23.7	23.9
8677	23.0	21.9	22.3	-	21.6	21.3	21.6	-	21.0	21.1	22.0	22.6
8678	-	23.1	23.4	22.2	21.7	22.4	-	20.7	21.4	21.0	21.2	22.8
8679	21.6	23.9	22.5	21.6	19.8	20.8	19.3	19.3	21.8	18.6	19.1	20.3
8680	20.3	19.9	20.7	21.1	20.5	20.9	20.5	20.9	21.0	17.8	18.6	21.5
8681	21.6	21.3	21.2	23.5	20.1	22.3	21.9	20.8	23.6	23.1	23.8	22.9
8682	21.3	20.9	21.8	22.4	20.7	21.1	20.8	21.7	23.0	21.6	22.9	23.8
8683	21.6	22.6	21.1	21.4	20.1	20.8	20.5	20.0	21.7	21.1	22.0	22.6
8684	20.1	20.1	21.2	22.6	20.1	21.2	21.5	21.7	20.9	20.7	20.8	20.5
8685	19.5	20.0	20.6	20.3	18.5	19.6	18.9	18.7	18.2	18.4	20.9	19.7
8686	19.4	20.9	21.1	20.2	19.6	19.7	19.1	18.6	20.0	21.2	20.3	22.7
8687	20.1	21.0	20.4	21.3	19.1	20.4	20.7	20.4	20.8	20.0	19.7	20.7
8688	-	23.1	23.9	26.0	22.5	24.5	24.1	25.2	24.5	23.9	24.5	24.5
8689	19.5	19.8	19.0	19.9	18.8	18.9	19.2	18.7	20.4	18.7	19.7	19.4
SAMPLE	17	19	20	12	20	20	19	12	20	20	19	20
MEAN	21.9	22.0*	22.1	21.9	21.3	21.6*	21.5*	20.5*	22.2	21.4*	21.7	22.5
S.D.	2.2	1.7	1.8	1.7	2.4	1.6	1.9	1.8	2.1	2.3	1.9	2.2
S.E.	0.5	0.4	0.4	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.4	0.5

*p<0.05 as compared to controls: Dunnett's t-test.

TABLE H-15 (CONTINUED)
PROJECT NO. 1073415
COMPUTER GROUP NO: 169H
LITTON BIONETICS, INC.
DAILY FOOD INTAKE IN GRAMS
GROUP 4 FEMALES DOSE: 3000 PPM

ANML NO.	DATES OF TESTING (1980-1981) 10/30	11/ 6	11/13	11/20	11/26	12/ 4	12/11	12/18	12/24	12/31	1/ 8	1/15
	1	2	3	4	5	6	7	8	9	10	11	12
8755	14.3	14.5	12.3	-	12.9	13.1	-	-	14.4	13.4	15.4	14.3
8756	16.5	15.8	16.0	-	16.2	17.0	17.2	-	17.7	17.4	18.4	17.1
8757	19.3	17.1	16.4	-	16.5	15.4	16.1	-	16.6	15.6	16.0	16.1
8758	14.3	14.1	14.3	-	14.6	14.3	13.9	-	14.9	13.9	14.3	14.6
8759	15.4	15.7	15.7	-	16.3	16.6	16.6	-	18.5	16.8	17.3	16.1
8760	15.6	15.3	14.5	-	13.6	14.2	14.4	-	14.2	15.4	15.0	14.8
8761	18.9	17.4	17.0	-	15.3	15.6	16.6	-	15.2	15.7	16.4	15.5
8762	16.5	17.7	16.1	-	17.0	17.4	17.1	-	16.7	17.3	17.9	16.0
8763	16.3	14.8	15.3	14.2	13.4	12.7	14.2	13.4	14.5	13.8	14.4	13.4
8764	17.1	17.6	18.6	18.7	16.0	17.1	16.5	16.7	18.1	16.7	17.0	16.3
8765	14.4	16.1	15.4	16.4	13.9	16.1	15.3	15.9	16.2	16.1	16.6	14.6
8766	17.6	17.8	15.7	15.9	14.4	16.2	16.4	16.1	17.2	16.4	16.7	16.7
8767	16.9	15.3	14.7	15.7	16.1	13.4	13.1	12.7	13.9	12.8	12.5	13.3
8768	16.3	15.8	13.2	13.4	12.6	13.0	12.2	12.7	14.4	12.9	13.4	12.9
8769	19.1	14.6	15.4	16.3	15.1	14.4	15.0	15.8	14.6	14.5	14.2	15.1
8770	15.3	19.1	16.4	16.6	15.1	15.5	16.4	15.3	16.5	15.8	17.6	16.3
8771	15.1	17.4	15.9	15.8	13.8	14.8	15.9	15.4	15.9	15.0	16.0	15.1
8772	16.8	16.1	15.4	15.0	14.0	14.1	14.8	14.1	15.7	15.4	14.9	15.6
8773	16.2	14.1	14.2	13.8	36.2	12.2	13.4	12.9	12.8	12.4	12.5	13.3
8774	18.1	20.5	19.8	20.9	18.7	20.1	16.9	17.4	19.3	19.1	18.9	18.6
SAMPLE	20	20	20	12	20	20	19	12	20	20	20	20
MEAN	16.5	16.3	15.6	16.0	16.1	15.2	15.4	14.9	15.9	15.3	15.8	15.3
S.D.	1.5	1.7	1.7	2.1	5.0	1.9	1.5	1.6	1.7	1.8	1.9	1.4
S.E.	0.3	0.4	0.4	0.6	1.1	0.4	0.3	0.5	0.4	0.4	0.4	0.3

TABLE H-16
PROJECT NO. 1073413
COMPUTER GROUP NO: 169A
LITTON MEDETICS, INC.
DAILY LIQUID INTAKE IN GRAMS

GROUP 1 MALES DOSE: 0 PPM

ANML NO.	DATES OF TESTING (1980-1981) 10/30	11/ 6	11/13	11/20	11/26	12/ 4	12/11	12/18	12/24	12/31	1/ 8	1/15
	1	2	3	4	5	6	7	8	9	10	11	12
8610	40.8	58.3	57.7	51.3	48.2	46.3	52.0	-	43.8	47.7	48.2	47.0
8611	32.3	45.3	39.1	40.8	36.1	32.8	29.7	31.6	33.9	28.7	34.9	29.8
8612	30.7	33.5	34.2	37.1	36.2	38.8	38.0	41.5	38.5	35.4	40.6	35.4
8613	35.3	42.5	48.6	50.2	43.9	55.9	45.1	49.3	54.0	43.5	50.5	42.1
8614	36.1	34.5	35.1	44.6	41.0	41.8	45.1	34.4	39.9	37.9	38.2	36.1
8615	29.3	31.7	31.1	34.3	33.0	35.6	34.7	34.5	27.5	32.2	38.8	27.5
8616	36.7	31.9	35.2	38.9	36.7	46.9	33.6	43.8	32.2	30.2	40.6	35.2
8617	65.2	38.0	38.3	44.8	36.8	50.0	38.0	49.3	40.2	34.9	39.5	37.3
8618	26.0	27.8	28.7	32.8	37.7	35.7	29.8	34.6	32.3	32.0	37.2	30.6
8619	36.6	36.8	40.2	40.6	40.9	42.3	42.5	34.3	39.2	35.7	49.0	35.6
8620	35.5	29.8	35.8	32.6	37.5	39.3	39.5	35.1	35.2	40.6	40.0	34.1
8621	31.6	38.0	29.6	39.1	36.8	41.6	36.3	36.3	35.2	35.7	42.8	37.0
8622	36.6	40.3	40.3	43.8	46.5	43.1	39.4	40.5	42.7	36.1	49.9	33.3
8623	31.9	30.3	29.1	32.8	30.4	32.8	30.6	28.1	31.5	30.1	37.9	32.4
8624	41.2	38.8	43.3	42.1	44.4	48.6	46.1	42.8	49.8	38.3	51.3	50.4
8625	33.7	37.8	32.0	37.6	32.2	43.7	38.5	25.8	35.2	34.9	54.5	33.1
8626	48.1	39.4	44.7	44.9	46.0	48.6	43.8	47.7	42.0	42.5	48.6	40.7
8627	31.8	35.1	36.5	38.1	38.0	41.3	34.1	35.3	35.0	41.8	42.5	33.4
8628	31.6	30.1	32.1	35.0	32.5	37.6	39.0	36.3	35.2	31.4	46.2	35.8
8629	37.6	46.3	49.0	42.3	40.2	63.9	-	37.1	46.4	41.2	56.0	42.9
SAMPLE	20	20	20	20	20	20	19	19	20	20	20	20
MEAN	36.4	37.3	37.9	40.2	38.7	43.2	38.7	37.8	38.5	36.5	44.3	36.5
S.D.	8.3	7.1	7.6	5.4	5.0	7.8	6.0	6.6	6.5	5.1	6.2	5.6
S.E.	1.8	1.5	1.7	1.2	1.1	1.7	1.3	1.5	1.4	1.1	1.3	1.2

TABLE H-16 (CONTINUED)
PROJECT NO. 1073415
COMPUTER GROUP NO: 1698
LITTON MEDNETICS, INC.
DAILY LIQUID INTAKE IN GRAMS

GROUP 1 FEMALE DOSE: 0 PPM

ANML NO.	DATES OF TESTING (1980-1981) 10/30	11/ 6	11/13	11/20	11/26	12/ 4	12/11	12/18	12/24	12/31	1/ 8	1/15
	1	2	3	4	5	6	7	8	9	10	11	12
8695	28.8	28.3	23.3	34.1	30.9	26.8	29.0	35.3	34.5	32.0	35.1	27.6
8696	21.9	19.3	23.1	26.7	24.7	22.6	24.3	30.1	26.0	22.4	32.8	21.3
8697	32.2	28.3	31.8	38.3	42.4	41.3	39.3	43.0	43.9	44.5	43.7	32.3
8698	32.3	35.3	32.3	35.1	35.2	34.5	37.3	31.6	27.2	39.0	45.8	35.8
8699	28.0	27.4	24.0	28.4	28.4	29.1	27.6	24.3	24.2	29.7	30.6	24.1
8700	39.0	-	-	45.6	32.4	40.7	39.2	38.6	46.4	58.6	45.8	32.1
8701	46.4	25.6	27.1	30.8	27.0	28.4	30.2	27.5	32.5	29.0	40.1	23.5
8702	26.0	26.8	24.8	26.4	25.2	29.3	20.9	29.5	23.1	21.9	35.3	19.6
8703	48.8	32.1	30.5	35.6	33.2	33.6	28.2	27.5	32.6	26.3	35.0	25.3
8704	23.8	21.5	25.6	26.4	26.7	24.3	26.4	25.1	35.4	23.5	26.6	27.1
8705	28.2	22.6	23.1	43.0	40.5	24.1	29.9	27.7	30.4	25.4	42.5	24.6
8706	34.6	31.5	32.3	38.3	31.7	37.4	36.0	31.2	34.4	34.4	45.6	33.5
8707	33.1	29.0	25.0	27.8	29.2	27.1	23.7	29.1	29.9	23.0	43.8	22.8
8708	31.6	31.2	26.1	37.3	28.0	32.9	24.8	25.2	30.6	30.7	31.3	27.9
8709	30.0	32.6	34.7	30.5	27.2	39.3	32.6	34.4	25.2	41.3	45.8	26.4
8710	29.6	33.3	44.3	28.1	36.0	25.8	26.8	18.9	26.8	21.0	29.6	22.8
8711	27.1	27.3	25.1	27.1	25.5	32.6	29.5	24.5	28.5	27.4	27.0	21.3
8712	41.2	29.4	22.8	29.6	23.8	29.9	26.2	30.0	29.4	31.1	27.4	24.0
8713	25.8	32.9	31.7	23.1	24.7	25.9	25.1	25.6	25.5	23.7	47.0	24.7
8714	35.0	22.0	26.4	28.6	26.0	28.0	25.1	26.3	26.5	33.0	26.3	25.2
SAMPLE	20	19	19	20	20	20	20	20	20	20	20	20
MEAN	32.2	28.2	28.1	31.9	29.9	30.7	29.1	29.3	30.6	30.9	36.7	26.1
S.D.	7.0	4.4	5.4	6.0	5.3	5.6	5.2	5.4	6.1	9.2	7.6	4.3
S.E.	1.5	1.0	1.2	1.3	1.1	1.2	1.1	1.2	1.3	2.0	1.7	0.9

TABLE H-16 (CONTINUED)
PROJECT NO. 1073415
COMPUTER GROUP NO: 169C
LITTON BIONETICS, INC.
DAILY LIQUID INTAKE IN GRAMS

GROUP 2 MALES DOSE: 500 PPM

ANML NO.	DATES OF TESTING (1980-1981)											
	10/30	11/ 6	11/13	11/20	11/26	12/ 4	12/11	12/18	12/24	12/31	1/ 8	1/15
	1	2	3	4	5	6	7	8	9	10	11	12
8630	-	39.5	40.1	44.5	39.6	44.7	36.0	41.6	43.4	41.7	47.1	41.3
8631	30.8	29.8	34.7	34.2	33.7	35.5	29.5	35.8	33.5	27.8	38.4	28.8
8632	38.1	39.5	44.4	52.9	48.5	46.8	39.4	44.9	43.4	46.3	59.5	45.4
8633	34.4	35.8	40.1	42.1	35.4	37.3	29.6	43.8	33.7	28.0	33.1	30.6
8634	38.6	34.2	42.2	46.4	47.0	37.9	37.3	37.7	41.2	40.5	52.3	40.5
8635	41.8	42.8	45.9	48.2	52.5	47.1	45.2	49.1	55.6	48.2	59.0	46.6
8636	35.8	34.5	36.1	40.6	40.3	45.5	45.2	44.5	50.8	36.7	63.9	47.5
8637	30.2	28.9	26.9	33.9	35.8	36.4	35.9	40.2	39.0	36.2	44.3	37.3
8638	32.2	31.1	32.3	34.8	36.5	41.4	32.5	33.5	38.5	40.6	37.3	61.8
8639	32.0	33.6	32.3	37.7	35.0	44.0	58.5	34.8	35.9	38.5	40.5	38.1
8640	29.9	29.8	28.6	33.1	26.6	36.4	24.6	35.1	40.2	33.3	36.6	32.0
8641	44.3	37.8	35.2	42.8	32.9	44.8	35.4	42.3	37.9	36.0	51.2	32.5
8642	31.0	28.6	28.1	29.3	34.0	30.7	30.2	33.6	34.4	30.5	39.7	34.1
8643	57.5	45.0	56.1	40.6	47.9	47.1	44.1	43.3	43.0	38.9	50.3	43.4
8644	27.4	22.6	23.9	27.8	30.2	29.3	30.6	32.5	33.5	33.3	44.6	32.8
8645	38.5	35.1	42.5	40.7	38.7	49.1	41.6	46.6	-	79.0	59.3	53.3
8646	32.8	29.8	36.6	36.0	34.7	32.6	28.9	27.9	30.5	29.7	41.2	28.0
8647	34.0	32.0	29.0	28.3	31.5	33.5	34.1	32.8	38.3	33.5	47.8	28.6
8648	40.6	38.5	40.4	44.4	47.6	44.4	44.5	37.4	39.0	39.1	46.6	37.0
8649	31.9	33.8	33.4	31.7	32.5	32.0	32.8	32.6	36.2	32.7	36.3	31.2
SAMPLE	19	20	20	20	20	20	20	20	19	20	20	20
MEAN	35.9	34.1	35.4	38.5	38.0	39.8	36.8	38.5	39.4	38.5	46.4	38.5
S.D.	6.9	5.5	6.1	6.9	7.1	6.5	7.9	5.7	6.1	11.0	8.9	9.0
S.E.	1.5	1.2	1.3	1.5	1.5	1.4	1.7	1.2	1.4	2.4	1.9	2.0

TABLE H-16 (CONTINUED)
PROJECT NO. 10735415
COMPUTER GROUP NO: 1690
LITTON BIONETICS, INC.
DAILY LIQUID INTAKE IN GRAMS

GROUP 2 FEMALE DOSE: 500 PPM

ANIMAL NO.	DATES OF TESTING (1980-1981)											
	10/30	11/ 6	11/13	11/20	11/26	12/ 4	12/11	12/18	12/24	12/31	1/ 8	1/15
	1	2	3	4	5	6	7	8	9	10	11	12
8715	27.8	29.6	27.7	30.9	28.2	29.6	27.1	32.8	41.5	33.6	38.8	31.1
8716	26.4	26.0	30.6	35.9	30.4	27.8	37.5	29.1	29.2	33.6	31.9	25.9
8717	25.2	22.1	27.1	59.5	46.4	35.1	30.9	49.1	29.5	45.4	58.0	24.8
8718	37.6	34.1	33.6	41.2	34.0	37.8	34.3	40.6	37.9	37.5	35.1	32.0
8719	28.2	23.6	28.9	31.5	19.6	29.2	24.3	28.1	26.9	24.7	30.4	23.5
8720	24.0	26.9	32.6	33.3	32.5	25.0	22.5	24.3	28.7	28.1	26.7	21.8
8721	29.4	26.2	33.1	34.4	28.4	30.7	26.1	27.2	33.7	29.5	32.4	31.8
8722	27.2	23.6	17.5	25.5	25.7	30.0	22.8	31.1	25.6	21.7	33.3	23.3
8723	36.5	29.5	27.1	41.5	33.2	33.6	33.6	30.6	35.3	35.2	41.5	36.8
8724	28.3	25.8	20.9	25.3	22.1	22.0	27.5	20.9	24.0	22.7	42.6	25.5
8725	27.5	26.0	29.5	32.1	29.2	28.5	30.1	32.4	17.0	28.1	35.8	32.3
8726	34.0	31.4	36.0	35.8	31.2	32.6	33.5	25.1	40.5	31.5	40.8	36.2
8727	25.1	25.0	20.7	33.1	27.6	30.0	27.4	29.3	36.2	27.8	35.6	28.7
8728	33.7	33.1	26.0	32.0	38.7	29.2	33.1	25.3	32.7	28.9	35.9	30.8
8729	31.5	23.8	23.1	26.6	24.0	30.4	25.6	24.7	32.2	27.5	25.6	26.3
8730	26.6	27.0	30.8	30.0	27.9	32.3	32.9	41.5	15.7	33.7	36.5	38.3
8731	29.9	25.4	19.8	26.8	26.5	26.1	23.0	23.4	28.2	24.7	31.2	23.4
8732	29.6	27.5	27.7	31.6	24.2	46.1	29.9	26.9	33.6	29.7	34.8	32.0
8733	29.0	28.2	24.7	26.3	26.7	29.1	27.3	25.6	32.9	31.5	35.6	25.5
8734	35.9	35.3	28.0	31.3	31.6	45.6	33.6	26.0	36.0	31.9	49.0	30.5
SAMPLE	20	20	20	20	20	20	20	20	20	20	20	20
MEAN	29.9	27.5	27.3	33.2	29.4	31.5	29.1	29.7	30.9	30.4	36.6	29.0
S.D.	3.7	3.6	4.9	7.6	5.9	5.9	4.4	6.9	6.8	5.4	7.3	4.8
S.E.	0.8	0.8	1.1	1.7	1.3	1.3	0.9	1.5	1.5	1.2	1.6	1.0

TABLE H-16 (CONTINUED)
PROJECT NO. 1073415
COMPUTER GROUP NO: 169E
LITTON BIONETICS, INC.
DAILY LIQUID INTAKE IN GRAMS

GROUP 3 MALES DOSE 1000 PPM

ANML NO.	DATES OF TESTING (1980-1981) 10/30	11/ 6	11/13	11/20	11/26	12/ 4	12/11	12/18	12/24	12/31	1/ 8	1/15
	1	2	3	4	5	6	7	8	9	10	11	12
8650	43.2	42.3	47.6	48.9	54.0	53.6	45.1	55.9	51.9	48.5	60.1	42.9
8651	36.8	34.3	39.4	45.5	37.7	40.3	34.1	48.2	46.3	42.0	57.9	73.1
8652	37.6	31.8	37.0	44.0	36.7	39.1	38.7	40.0	37.9	32.5	43.5	35.5
8653	42.6	40.6	44.1	44.5	37.0	40.1	49.1	43.9	41.7	38.5	44.6	36.5
8654	35.9	37.9	37.8	36.0	31.5	40.6	32.8	45.1	38.7	35.4	39.3	30.3
8655	35.9	36.2	36.8	39.1	46.3	45.0	37.3	41.1	49.6	36.5	42.0	42.6
8656	39.4	40.2	39.8	28.1	37.2	45.0	40.5	43.3	53.2	42.2	53.1	51.8
8657	40.3	36.8	37.6	51.1	34.9	44.4	39.4	50.1	39.4	39.7	44.0	38.8
8658	37.2	35.0	38.7	46.4	46.5	37.3	40.1	38.5	44.7	38.4	40.7	32.5
8659	33.0	33.0	33.7	37.6	41.3	38.5	33.3	40.3	47.9	41.4	37.0	31.6
8660	39.7	36.2	39.1	34.7	35.2	38.9	36.7	34.6	46.9	39.2	38.5	36.5
8661	34.5	35.4	33.2	34.0	33.3	36.0	36.1	34.0	33.2	-	35.5	29.8
8662	44.6	44.0	50.7	49.4	58.8	58.1	56.5	49.5	53.7	57.0	47.5	45.6
8663	38.0	39.8	43.2	36.1	45.1	43.1	41.6	41.6	53.3	40.9	52.8	39.1
8664	38.9	38.2	40.0	35.8	39.6	40.7	45.7	36.2	45.5	35.2	76.6	32.2
8665	43.0	36.5	44.3	43.3	42.7	46.9	-	49.5	44.4	46.9	44.3	44.7
8666	34.6	29.2	34.1	34.1	29.0	33.6	28.3	31.3	34.5	35.1	34.8	31.5
8667	41.5	35.8	46.4	39.8	42.2	44.3	40.2	42.8	53.7	40.6	44.8	45.4
8668	32.3	36.3	39.6	38.6	38.0	41.8	40.1	37.7	34.5	38.5	42.6	34.4
8669	35.4	33.9	40.5	40.5	38.5	44.8	40.8	38.6	43.3	30.4	46.5	-
SAMPLE	20	20	20	20	20	20	19	20	20	19	20	19
MEAN	38.2	36.6	40.2	40.4	40.2	42.6	39.8	42.1	44.7*	39.9	46.3	39.7
S.D.	3.5	3.6	4.6	6.1	7.3	5.6	6.3	6.2	6.7	6.0	9.8	10.1
S.E.	0.7	0.8	1.0	1.3	1.6	1.2	1.4	1.3	1.5	1.3	2.2	2.3

*p<0.05 as compared to controls: Dunnett's t-test.

TABLE H-16 (CONTINUED)
PROJECT NO. 1073415
COMPUTER GROUP NO: 169F
LITTON BIOMETICS, INC.
DAILY LIQUID INTAKE IN GRAMS

GROUP 3 FEMALE DOSE: 1000 PPM

ANML NO.	DATES OF TESTING (1980-1981) 10/30	11/ 6	11/13	11/20	11/26	12/ 4	12/11	12/18	12/24	12/31	1/ 8	1/15
	1	2	3	4	5	6	7	8	9	10	11	12
8735	25.8	35.2	36.0	34.6	28.9	31.0	22.5	27.6	29.3	26.5	32.1	26.3
8736	37.2	45.5	32.6	35.7	62.5	59.4	64.4	35.5	40.0	40.6	43.5	54.4
8737	35.2	34.1	34.0	35.8	30.2	32.8	30.1	32.7	38.5	29.7	37.6	27.7
8738	31.6	31.2	30.5	39.0	31.5	33.8	33.0	35.5	42.0	38.7	36.6	33.6
8739	37.2	31.3	36.5	33.2	33.9	34.0	42.3	36.1	36.2	45.2	42.6	34.8
8740	36.1	31.1	33.2	33.3	35.1	44.1	42.6	36.3	46.8	29.9	41.3	37.5
8741	34.0	27.7	24.7	39.1	28.3	34.4	38.5	27.6	39.9	34.2	39.6	26.8
8742	29.5	33.4	32.9	29.5	55.6	44.3	-	47.8	-	61.9	68.8	61.9
8743	27.6	25.9	35.4	34.8	34.7	36.8	33.0	38.5	32.5	35.7	33.1	32.1
8744	30.8	29.1	29.0	27.7	34.5	34.4	38.6	32.4	26.1	29.7	33.3	28.3
8745	55.3	29.7	26.8	24.9	28.7	25.1	22.0	25.2	24.0	21.5	28.5	20.3
8746	24.9	25.6	25.8	30.2	27.4	36.1	31.0	32.8	31.5	30.2	35.8	27.8
8747	26.1	32.0	27.5	38.5	42.4	24.5	23.5	25.6	27.9	27.9	29.1	23.5
8748	33.4	25.7	30.9	31.7	29.5	34.6	31.0	26.7	39.8	34.5	32.2	26.5
8749	38.7	45.5	45.4	49.4	39.2	43.3	45.4	36.3	36.4	42.3	45.8	42.2
8750	34.9	31.8	37.1	34.2	48.0	31.9	32.0	35.1	48.1	30.7	58.5	29.7
8751	-	38.5	44.0	37.7	45.0	35.1	37.6	40.8	44.8	39.2	58.0	32.3
8752	34.1	31.0	32.9	35.1	37.2	29.8	30.8	39.3	36.2	30.1	36.3	28.5
8753	41.8	33.5	32.2	31.1	31.5	33.3	30.5	33.3	42.1	33.2	37.2	34.5
8754	28.1	26.7	30.6	26.2	34.8	29.0	29.5	26.0	34.2	22.2	27.5	23.7
SAMPLE	19	20	20	20	20	20	19	20	19	20	20	20
MEAN	33.8	32.2*	33.1*	34.1	36.9*	35.5*	34.6*	33.5	36.6*	34.2	39.9	32.6*
S.D.	7.0	5.6	5.4	5.4	9.4	7.7	9.7	5.8	6.8	9.0	10.8	10.1
S.E.	1.6	1.2	1.2	1.2	2.1	1.7	2.2	1.3	1.5	2.0	2.4	2.2

*p<0.05 as compared to controls: Dunnett's t-test.

TABLE H-16 (CONTINUED)
PROJECT NO. 10735-15
COMPUTER GROUP NO: 169G
LITTON BIONETICS, INC.
DAILY LIQUID INTAKE IN GRAMS

GROUP 4 MALES DOSE: 5000 PPM

ANML NO.	DATES OF TESTING (1980-1981) 10/30	11/ 6	11/13	11/20	11/26	12/ 4	12/11	12/18	12/24	12/31	1/ 8	1/15
	1	2	3	4	5	6	7	8	9	10	11	12
8670	37.0	28.6	32.8	37.0	32.4	33.5	29.8	35.3	33.0	34.0	35.3	36.3
8671	33.9	34.1	38.8	42.8	38.0	41.6	32.6	39.1	50.0	33.5	41.8	41.0
8672	32.1	32.1	29.3	34.6	30.6	34.2	35.3	43.4	35.0	37.5	71.6	56.7
8673	42.7	37.2	45.4	46.4	51.0	41.4	42.7	43.0	47.8	39.7	48.5	42.3
8674	45.0	33.8	-	39.3	36.9	36.9	33.4	40.3	42.5	38.8	42.0	34.3
8675	42.3	38.7	38.4	38.0	42.0	44.0	35.4	43.0	48.2	36.2	42.8	34.4
8676	34.0	31.6	35.5	28.1	33.2	35.2	28.3	46.5	38.4	34.4	43.6	36.2
8677	37.8	33.6	39.3	37.3	35.5	39.0	34.0	40.1	34.2	37.5	39.5	38.0
8678	32.4	28.5	35.9	32.1	35.5	31.2	25.6	33.1	31.4	26.2	35.8	35.8
8679	39.8	38.9	37.4	39.8	38.5	38.1	30.5	38.0	39.4	26.0	41.2	35.9
8680	31.3	29.6	33.3	41.2	42.3	40.7	42.1	38.6	36.0	33.0	37.2	32.3
8681	38.5	42.1	45.4	46.5	44.4	52.3	56.9	56.3	60.3	48.8	71.2	47.9
8682	32.0	36.2	36.1	42.3	36.1	38.1	37.0	38.1	43.8	37.2	41.1	35.3
8683	35.1	35.7	33.9	35.5	53.7	38.3	35.5	36.8	38.8	36.1	44.1	39.0
8684	35.4	39.9	45.7	40.0	34.4	39.4	34.5	40.4	38.2	33.5	40.6	-
8685	30.3	26.4	28.7	30.9	53.2	31.9	26.6	32.0	27.2	28.3	32.5	27.3
8686	28.0	28.1	30.1	31.5	29.4	31.7	22.0	24.6	22.2	27.5	31.6	28.3
8687	38.4	46.3	48.3	42.1	41.5	47.3	43.7	46.0	42.4	41.6	51.1	47.9
8688	41.4	42.2	43.8	42.8	48.7	53.7	40.0	43.8	47.0	41.5	51.5	50.3
8689	29.5	32.1	28.6	31.8	33.2	36.4	32.8	32.6	36.8	33.4	42.5	33.8
SAMPLE	20	20	19	20	20	20	20	20	20	20	20	19
MEAN	35.8	34.8	37.0	38.0	39.5	39.2	34.7	39.6	39.6	35.2	44.3	38.6
S.D.	4.8	5.4	6.2	5.2	7.4	6.2	7.7	6.6	8.6	5.6	10.6	7.5
S.E.	1.0	1.2	1.4	1.1	1.6	1.4	1.7	1.4	1.9	1.2	2.3	1.7

TABLE H-16 (CONTINUED)
PROJECT NO. 1073415
COMPUTER GROUP NO: 169H
LITTON BIONETICS, INC.
DAILY LIQUID INTAKE IN GRAMS

GROUP 4 FEMALE DOSE: 5000 PPM

ANML NO.	DATES OF TESTING (1980-1981)											
	10/30	11/ 6	11/13	11/20	11/26	12/ 4	12/11	12/18	12/24	12/31	1/ 8	1/15
	1	2	3	4	5	6	7	8	9	10	11	12
8755	25.0	23.7	23.8	34.1	28.3	33.1	27.5	39.6	32.0	29.5	33.5	23.4
8756	29.9	22.3	25.1	33.3	32.7	34.0	31.1	34.6	53.6	32.4	37.4	33.5
8757	33.5	26.1	25.2	34.5	36.5	35.4	36.7	38.6	39.1	27.6	41.7	35.3
8758	29.9	28.8	35.2	39.8	37.5	39.1	37.3	45.3	39.3	34.6	52.9	32.6
8759	34.8	34.7	33.6	38.6	42.0	40.7	-	38.4	36.5	28.0	40.2	28.9
8760	26.6	23.6	33.9	27.3	29.4	37.6	33.0	34.6	29.7	33.8	34.1	29.8
8761	29.5	23.6	27.8	27.1	27.9	31.1	26.3	30.5	28.4	25.0	30.6	30.6
8762	29.7	30.8	29.4	33.4	40.4	35.6	38.5	38.4	39.7	34.6	44.0	63.3
8763	30.5	26.4	32.6	25.6	32.7	28.5	29.8	27.3	26.1	25.0	33.1	24.5
8764	35.7	38.0	37.4	45.8	46.7	40.7	37.8	34.4	43.2	30.5	39.2	27.4
8765	28.5	33.2	33.5	45.9	37.0	40.5	41.7	42.0	43.1	37.0	40.9	39.4
8766	28.6	29.7	24.9	36.2	24.8	30.3	29.1	32.7	29.5	28.9	34.8	28.0
8767	24.9	25.6	25.2	25.7	22.0	27.5	21.3	26.2	22.3	25.9	23.4	24.8
8768	22.7	26.1	33.5	32.8	28.8	28.3	23.6	25.8	33.3	24.5	30.0	25.4
8769	34.1	26.9	27.7	29.6	35.0	38.4	32.7	35.5	29.0	30.0	45.3	31.0
8770	25.2	31.3	33.1	28.6	37.0	34.5	40.7	37.3	42.3	36.4	46.2	37.9
8771	22.5	24.2	26.4	29.7	29.5	28.1	32.1	31.0	40.4	25.8	37.1	32.5
8772	29.8	26.1	23.1	32.9	29.1	28.8	28.7	29.1	36.7	30.0	42.5	28.8
8773	25.6	23.1	20.1	24.2	28.2	22.5	19.0	21.6	21.6	21.1	25.2	20.8
8774	29.0	31.8	34.6	40.6	41.4	37.8	33.0	36.5	33.7	39.0	74.3	44.5
SAMPLE	20	20	20	20	20	20	19	20	20	20	20	20
MEAN	28.8	27.8	29.3	33.3	33.3	33.6	31.6	34.0 *	35.0	30.0	38.2	32.1 *
S.D.	3.7	4.5	4.9	6.3	6.3	5.3	6.3	5.9	7.9	4.8	10.4	9.3
S.E.	0.8	0.9	1.1	1.4	1.4	1.1	1.4	1.3	1.7	1.0	2.3	2.0

*p<0.05 as compared to controls: Dunnett's t-test.

LITTON BIONETICS, INC.
PROJECT NO. 10734-15

TABLE H-17

CLINICAL HEMATOLOGY

KEY

WBC	=	Leukocyte Count	$10^3/mm^3$
RBC	=	Erythrocyte Count	$10^6/mm^3$
HGB	=	Hemoglobin	g%
HCT	=	Hematocrit	vol %
RET	=	Reticulocyte	%
BN	=	Band Neutrophils	%
SG	=	Segmented Neutrophils	%
LY	=	Lymphocytes	%
MO	=	Monocytes	%
EO	=	Eosinophils	%
BS	=	Basophils	%
IM	=	Immature	%
OT	=	Other	%

* - $p<0.05$ as compared to controls: Dunnett's t-test.

I = Quantity not sufficient

CLINICAL HEMATOLOGY [illegible]

TABLE H-17 (CONTINUED)
INDIVIDUAL ANIMAL HEMATOLOGY DATA - WEEK 4
INTERVAL OF STUDY: WEEK 4

DOSE GROUP	ANIMAL ID	WBC	RBC	HGB	HCT	RET	BN	SG	LY	MO	EO	BS	IM	UT
0 PPM	A610	7.4	7.25	17.0	50.5	0.8	.	19	81	.	.	.	.	.
	A611	4.7	7.50	15.8	51.0	1.4	.	13	87	.	.	.	.	.
	A612	7.8	7.91	16.1	49.0	2.6	.	23	76	.	1	.	.	.
	A613	7.6	7.59	15.6	48.0	1.4	.	28	70	.	2	.	.	.
	A614	8.4	7.92	17.1	50.5	1.7	.	7	89	2	2	.	.	.
	A615	8.5	8.85	16.9	53.0	2.5	.	36	62	.	2	.	.	.
	A616	7.5	7.55	15.0	47.0	2.9	.	14	83	.	3	.	.	.
	A617	6.8	7.51	14.8	44.5	2.4	.	19	79	.	2	.	.	.
	MEAN	7.14	7.707	16.04	49.19	1.96								
	SE	0.55	0.188	0.32	0.94	0.26								
	N	8	8	8	8	8								
500 PPM	A650	4.2	6.78	15.2	46.0	1.4	.	12	87	.	1	.	.	.
	A651	4.7	6.85	16.3	48.0	2.6	.	15	84	.	1	.	.	.
	A652	8.3	7.97	16.4	49.5	2.2	.	11	89	.	.	.	.	.
	A653	8.5	8.71	15.6	46.5	2.4	.	19	81	.	.	.	.	.
	A654	7.3	7.91	15.4	46.0	1.5	.	10	90	.	.	.	.	.
	A655	8.4	7.59	16.0	47.0	2.2	.	14	81	5	.	.	.	.
	A656	8.9	8.68	15.3	45.0	2.6	.	29	70	.	1	.	.	.
	A657	8.8	7.38	16.2	49.0	1.5	.	20	80	.	.	.	.	.
	MEAN	8.04	7.252	15.80	47.13	2.05								
	SE	0.54	0.192	0.17	0.56	0.18								
	N	8	8	8	8	8								

CLINICAL HEMATOLOGIES FOR [illegible]

TABLE H-17 (CONTINUED)
INDIVIDUAL [illegible] ALES
INTERVAL OF STUDY= [illegible]

DOSE GROUP	ANIMAL [illegible]	[illegible]	[illegible]	HGB	HCT	RET	BN	SG	LY	MO	EO	BS	IM	OT
1000 PPM	8650	9.5	7.85	16.2	48.0	1.4	.	15	83	1	1	.	.	.
	8651	11.5	7.53	16.0	49.0	1.8	1	27	70	1	1	.	.	.
	8652	4.6	7.55	16.7	49.0	1.8	.	21	78	1	.	.	.	.
	8653	10.2	8.46	17.2	51.0	2.0	.	22	77	.	1	.	.	.
	8654	8.6	8.21	16.5	50.5	1.4	.	15	82	2	1	.	.	.
	8655	8.3	7.83	15.9	47.0	1.7	.	17	81	1	1	.	.	.
	8656	10.1	7.85	15.5	46.5	2.4	.	30	66	4	.	.	.	.
	8657	6.8	8.03	16.0	47.5	1.9	.	16	83	1	.	.	.	.
	MEAN	8.70	7.914	16.25	48.56	1.80								
	SE	0.77	0.111	0.19	0.57	0.11								
	N	8	8	8	8	8								
3000 PPM	8670	6.6	7.84	16.4	47.5	2.2	.	23	77	.	.	.	.	.
	8671	9.5	7.51	15.4	46.0	1.4	.	17	81	1	1	.	.	.
	8672	7.5	7.10	16.5	48.0	4.7	.	31	67	1	1	.	.	.
	8673	6.9	7.27	16.0	47.0	3.8	.	28	69	3	.	.	.	.
	8674	5.8	7.42	15.1	45.0	1.0	.	23	75	1	1	.	.	.
	8675	6.4	7.04	15.6	46.0	1.8	.	12	87	1	.	.	.	.
	8676	9.9	6.95	15.6	47.0	2.7	.	11	88	1	.	.	.	.
	8677	5.3	7.84	16.9	51.0	1.8	.	28	70	1	1	.	.	.
	MEAN	7.24	7.371	15.94	47.19	2.42								
	SE	0.59	0.122	0.22	0.64	0.44								
	N	8	8	8	8	8								

CLINICAL HEMATOLOGIES FOR [illegible]

TABLE H-17 (CONTINUED)
INDIVIDUAL ANIMAL HEMATOLOGIES-FEMALES
INTERVAL OF STUDY= [illegible]

DOSE GROUP	ANIMAL NO	BC	RBC	HGB	HCT	RET	BN	SG	LY	MO	EO	BS	IM	UT
0 PPM	8695	4.8	7.28	16.3	47.5	1.4	.	23	75	2	.	.	.	.
	8696	4.6	6.46	14.1	48.0	1.6	.	36	64	.	.	.	.	.
	8697	8.4	8.03	17.0	48.5	0.8	.	10	88	1	1	.	.	.
	8698	5.4	7.55	15.1	46.5	1.4	.	14	85	.	1	.	.	.
	8699	8.1	7.55	16.8	49.0	1.9	.	22	78	.	.	.	.	.
	8700	6.2	8.91	17.6	53.0	2.0	.	15	85	.	.	.	.	.
	8701	4.6	7.85	16.3	47.0	1.3	.	10	89	.	1	.	.	.
	8702	4.8	7.47	15.0	45.0	3.1	.	18	81	.	1	.	.	.
	MEAN	5.61	7.637	16.02	48.06	1.69								
	SE	0.63	0.246	0.42	0.83	0.24								
	N	8	8	8	8	8								
300 PPM	8715	4.3	7.15	15.8	46.0	1.2	.	14	82	2	2	.	.	.
	8716	3.3	6.55	16.2	47.0	1.8	.	20	78	2	.	.	.	.
	8717	4.7	7.70	15.4	45.0	2.6	.	17	82	1	.	.	.	.
	8718	4.7	7.49	15.8	47.0	1.4	.	13	86	.	1	.	.	.
	8719	5.5	7.05	15.4	45.0	1.0	.	12	87	.	1	.	.	.
	8720	5.1	6.59	14.9	46.0	2.9	.	9	91	.	.	.	.	.
	8721	3.4	6.54	14.8	42.5	1.8	.	17	80	1	2	.	.	.
	8722	5.5	7.40	15.1	44.5	2.3	.	13	87	.	.	.	.	.
	MEAN	5.19	7.059	15.42	45.38 *	1.87								
	SE	0.52	0.162	0.17	0.52	0.24								
	N	8	8	8	8	8								

CLINICAL PATHOLOGIES [illegible]

TABLE H-17 (CONTINUED)
[illegible]

DOSE GROUP	ANIMAL ID	WBC	RBC	HGB	HCT	RET	BN	SG	LY	MO	EO	BS	IM	OT
1000 PPM	A735	6.7	6.66	15.1	45.0	1.4	.	31	68	.	1	.	.	.
	A736	4.8	8.58	15.6	46.0	1.8	.	6	93	1	.	.	.	.
	A737	7.0	7.75	15.4	46.5	1.8	.	12	87	.	1	.	.	.
	A738	5.2	7.77	16.6	48.5	2.0	.	19	80	.	1	.	.	.
	A739	6.3	7.62	15.4	46.0	0.4	.	25	73	2	.	.	.	.
	A740	7.8	9.02	16.7	49.5	1.6	.	11	85	2	2	.	.	.
	A741	7.3	7.58	15.6	46.6	1.1	.	12	87	1	.	.	.	.
	A742	7.5	7.59	16.4	49.0	2.1	.	8	92	.	.	.	.	.
	MEAN	6.57	7.821	15.85	47.06	1.52								
	SE	0.39	0.251	0.22	0.59	0.20								
	N	8	8	8	8	8								
3000 PPM	A755	4.0	7.64	15.2	44.0	3.5	.	21	77	1	1	.	.	.
	A756	5.8	6.87	15.4	46.0	2.9	.	14	85	1	.	.	.	.
	A757	5.0	6.98	15.2	44.0	4.3	.	13	86	.	1	.	.	.
	A758	4.5	8.19	16.5	49.0	3.0	.	10	89	1	.	.	.	.
	A759	4.6	7.32	15.5	46.5	0.9	.	13	87	.	.	.	.	.
	A760	4.9	6.32	16.2	47.0	1.3	.	9	89	2	.	.	.	.
	A761	5.7	7.28	14.8	44.5	1.1	.	19	79	2	.	.	.	.
	A762	7.5	7.05	16.2	47.0	1.0	.	14	84	1	1	.	.	.
	MEAN	5.29	7.206	15.62	46.00	2.25								
	SE	0.38	0.196	0.21	0.62	0.47								
	N	8	8	8	8	8								

CLINICAL HEMATOLOGIES FOR P-1073415

TABLE H-17 (CONTINUED)
INDIVIDUAL ANIMAL HEMATOLOGIES-MALES
INTERVAL OF STUDY= WEEK 8

DOSE GROUP	ANIMAL NO	WBC	RBC	HGB	HCT	RET	BN	SG	LY	MO	EO	BS	IM	UT
0 PPM	8610	5.2	8.58	16.0	49.0	1.9	.	14	84	2	.	.	.	.
	8611	4.7	8.69	17.1	51.0	1.3	.	16	82	.	2	.	.	.
	8612	6.8	8.86	16.4	50.5	2.5	.	25	75	.	.	.	.	.
	8613	9.2	8.30	15.9	48.0	2.9	.	19	81	.	.	.	.	.
	8614	6.8	7.99	16.1	48.5	3.2	.	9	86	3	2	.	.	.
	8615	9.0	8.20	16.4	50.5	1.4	.	26	72	2	.	.	.	.
	8616	4.7	8.02	15.7	48.0	2.6	.	10	87	2	1	.	.	.
	8617	3.5	7.58	15.4	45.5	3.6	.	12	87	1	.	.	.	.
	MEAN	6.24	8.277	16.12	48.88	2.42								
	SE	0.74	0.149	0.18	0.64	0.29								
	N	8	8	8	8	8								
300 PPM	8630	4.8	8.85	16.9	51.0	2.8	.	32	68	.	.	.	.	.
	8631	5.0	8.21	16.4	49.0	1.8	.	12	87	.	1	.	.	.
	8632	8.2	8.86	17.1	51.5	2.4	2	14	81	2	1	.	.	.
	8633	6.6	7.87	15.2	46.5	1.9	.	6	94	.	.	.	.	.
	8634	7.6	8.17	15.1	46.0	5.4	.	10	90	.	.	.	.	.
	8635	6.0	7.53	15.3	46.0	2.4	.	9	89	1	1	.	.	.
	8636	5.3	8.60	15.5	47.0	2.8	.	8	90	2	.	.	.	.
	8637	6.0	7.92	16.0	49.0	2.8	.	21	79	.	.	.	.	.
	MEAN	6.19	8.251	15.94	48.25	2.79								
	SE	0.45	0.171	0.28	0.78	0.40								
	N	8	8	8	8	8								

TABLE H-17 (CONTINUED)
INDIVIDUAL ANIMAL HEMATOLOGIES-MALES
INTERVAL OF STUDY= WEEK 8

DOSE GROUP	ANIMAL NO	WBC	RBC	HGB	HCT	RET	BN	SG	LY	MO	EO	BS	IM	OT
1000 PPM	8650	9.4	8.84	17.4	51.0	1.7	.	11	85	3	1	.	.	.
	8651	7.4	8.16	16.8	49.5	2.6	.	12	87	1	.	.	.	.
	8652	4.8	8.85	17.5	51.0	1.4	.	10	86	3	1	.	.	.
	8653	5.7	8.44	15.4	47.5	1.8	.	13	85	1	1	.	.	.
	8654	8.2	7.99	15.1	45.0	1.6	.	21	77	1	1	.	.	.
	8655	6.6	8.48	16.2	49.0	2.9	.	14	86	.	.	.	.	.
	8656	9.3	8.91	16.5	48.0	2.5	.	12	84	2	2	.	.	.
	8657	6.6	8.30	15.9	47.0	2.0	.	10	90	.	.	.	.	.
	MEAN	7.25	8.496	16.35	48.50	2.06								
	SE	0.58	0.121	0.31	0.73	0.19								
	N	8	8	8	8	8								
5000 PPM	8670	6.1	8.95	17.2	51.0	2.1	.	12	87	1	.	.	.	.
	8671	7.9	8.19	17.0	50.0	1.2	.	85	8	6	1	.	.	.
	8672	6.0	7.68	16.1	49.0	2.9	.	10	87	2	1	.	.	.
	8673	6.0	7.22	15.9	49.0	1.5	.	5	89	3	3	.	.	.
	8674	3.8	8.56	15.6	45.0	1.6	.	14	85	1	.	.	.	.
	8675	5.9	6.47	14.6	43.0	2.1	.	10	89	.	1	.	.	.
	8676	13.3	8.17	16.7	49.0	3.0	.	16	82	1	1	.	.	.
	8677	5.5	8.70	17.7	52.5	1.0	.	13	87	.	.	.	.	.
	MEAN	6.81	7.992	16.55	48.56	1.90								
	SE	1.01	0.293	0.55	1.10	0.27								
	N	8	8	8	8	8								

TABLE H-17 (CONTINUED)
INDIVIDUAL ANIMAL HEMATOLOGIES-FEMALES
INTERVAL OF STUDY= WEEK 8

DOSE GROUP	ANIMAL NO	WBC	RBC	HGB	HCT	MCV	BA SG LY MO EO NS IM OT
0 PPM	8695	4.8	8.42	16.5	50.0	2.0	. 26 74 . . . . .
	8696	4.6	8.56	16.0	48.0	1.2	. 13 87 . . . . .
	8697	10.0	8.27	16.3	49.0	1.7	. 14 86 . . . . .
	8698	4.2	8.30	15.7	45.5	2.0	. 14 85 . 1 . . .
	8699	4.2	8.37	17.0	51.0	1.8	. 8 91 1 . . . .
	8700	7.2	6.95	16.8	51.0	1.4	. 15 82 3 . . . .
	8701	3.1	6.55	15.8	47.0	3.6	. 3 96 . 1 . . .
	8702	5.5	7.99	17.2	52.0	4.2	. 10 89 . 1 . . .
	MEAN	5.45	7.727	16.41	49.19	2.28	
	SE	0.77	0.2[illegible]	[illegible]	0.79	[illegible]	
	N	8	8	8	8		
300 PPM	8715	3.9	7.53	15.7	48.0	2.6	. 9 90 1 . . . .
	8716	4.5	8.[illegible]	[illegible]	[illegible]	5.0	. 15 85 . . . . .
	8717	4.4	7.[illegible]	16.1	[illegible]	3.5	. 10 88 1 1 . . .
	8718	4.7	8.05	[illegible]	51.5	1.6	. 11 86 2 . . . .
	8719	4.8	8.[illegible]	[illegible]	[illegible]	1.0	. 11 89 . . . . .
	8720	3.3	7.[illegible]	[illegible]	[illegible]	2.4	. 9 91 . . . . .
	8721	6.6	6.[illegible]	[illegible]	[illegible]	4.1	. 9 90 . 1 . . .
	8722	5.1	7.59	15.3	47.0	2.1	. 12 87 . 1 . . .
	MEAN	4.41	7.754	16.09	48.25	2.37	
	SE	0.38	0.215	0.30	0.77	0.28	
	N	8	8	8	8	8	

CLINICAL HEMATOLOGIES FOR P-1073415

TABLE H-17 (CONTINUED)
INDIVIDUAL ANIMAL HEMATOLOGIES-FEMALES
INTERVAL OF STUDY: WEEK 8

DOSE GROUP	ANIMAL NO	WBC	RBC	HGB	HCT	RET	BN	SG	LY	MO	EO	BS	IM	OT
1000 PPM	8735	3.7	7.68	14.9	42.0	2.2	.	19	81	.	.	.	.	.
	8736	4.8	7.99	15.3	46.5	1.2	.	24	75	1	.	.	.	.
	8737	4.5	8.03	15.0	47.0	2.0	.	11	88	1	.	.	.	.
	8738	5.9	7.83	16.8	51.0	1.9	.	18	82	.	.	.	.	.
	8739	4.4	9.22	16.4	48.5	2.7	.	16	84	.	.	.	.	.
	8740	5.3	8.12	16.9	48.0	1.5	.	12	88	.	.	.	.	.
	8741	3.2	7.87	15.7	46.0	1.9	.	10	88	1	1	.	.	.
	8742	5.3	8.67	17.2	50.0	1.1	.	9	87	2	2	.	.	.
	MEAN	4.64	8.176	16.02	47.38	1.81								
	SE	0.31	0.182	0.32	0.98	0.19								
	N	8	8	8	8	8								
3000 PPM	8755	2.4	6.98	15.2	47.0	1.0	.	15	83	1	.	1	.	.
	8756	4.1	7.31	16.0	47.5	1.7	.	21	78	1	.	.	.	.
	8757	2.7	7.84	15.9	48.0	1.3	.	18	81	1	.	.	.	.
	8758	6.7	8.97	18.2	55.0	2.0	.	17	83	.	.	.	.	.
	8759	2.5	7.63	16.0	47.0	1.6	.	13	87	.	.	.	.	.
	8760	5.8	8.89	16.2	49.0	1.2	.	12	87	.	1	.	.	.
	8761	5.0	7.19	15.0	45.0	1.8	.	7	92	.	1	.	.	.
	8762	6.3	7.49	15.9	47.0	3.0	.	6	94	.	.	.	.	.
	MEAN	4.42	7.787	16.05	48.19	1.70								
	SE	0.63	0.266	0.34	1.05	0.22								
	N	8	8	8	8	8								

CLINICAL HEMATOLOGIES FOR P-1073415

TABLE H-17 (CONTINUED)

INDIVIDUAL ANIMAL HEMATOLOGIES-MALES
INTERVAL OF STUDY= WEEK 12

DOSE GROUP	ANIMAL NO	WBC	RBC	HGB	HCT	RET	BN	SG	LY	MO	EO	BS	IM	OT
0 PPM	8610	9.7	7.26	17.2	50.0	2.4	.	27	69	2	2	.	.	.
	8611	7.3	6.25	16.0	47.5	1.8	.	23	76	1	.	.	.	.
	8612	8.0	6.07	16.4	49.5	1.2	.	20	79	1	.	.	.	.
	8613	.	.	.	.	.	.	.	.	.	.	.	.	.
	8614	5.3	8.93	17.2	51.5	0.8	.	18	82	.	.	.	.	.
	8615	11.5	8.13	15.1	45.0	3.8	.	47	52	1	.	.	.	.
	8616	6.4	7.32	15.4	46.0	1.6	.	10	88	2	.	.	.	.
	8617	5.4	8.30	15.4	46.5	2.6	.	12	87	1	.	.	.	.
	MEAN	7.67	7.751	16.10	48.00	2.03								
	SE	0.86	0.332	0.33	0.90	0.38								
	N	7	7	7	7	7								
300 PPM	8630	5.6	6.00	15.8	47.0	1.2	.	39	58	.	3	.	.	.
	8631	6.2	6.30	16.4	49.0	1.8	.	17	83	.	.	.	.	.
	8632	10.5	8.30	16.2	48.5	1.8	.	22	76	.	2	.	.	.
	8633	5.9	7.27	15.4	46.0	1.2	.	15	84	.	1	.	.	.
	8634	7.5	8.45	15.3	45.0	1.7	.	12	88	.	.	.	.	.
	8635	7.2	8.04	16.0	48.5	1.4	.	22	78	.	.	.	.	.
	8636	5.9	8.23	16.1	49.0	2.1	.	16	84	.	.	.	.	.
	8637	7.6	8.07	15.4	47.0	2.4	.	31	68	.	1	.	.	.
	MEAN	7.05	7.582	15.82	47.50	1.70								
	SE	0.57	0.338	0.15	0.53	0.15								
	N	8	8	8	8	8								

TABLE H-17 (CONTINUED)
INDIVIDUAL ANIMAL HEMATOLOGIES-MALES
INTERVAL OF STUDY= WEEK 12

DOSE GROUP	ANIMAL NO	WBC	RBC	HGB	HCT	RET	BN	SG	LY	MO	EO	BS	IM	OT
1000 PPM	8650	10.3	6.91	15.2	44.5	1.6	.	13	87	.	.	.	.	.
	8651	6.8	6.19	15.0	43.0	2.4	.	21	78	.	1	.	.	.
	8652	8.4	7.80	16.0	48.0	1.0	.	22	72	5	1	.	.	.
	8653	8.5	6.32	16.2	47.5	2.8	.	18	81	.	1	.	.	.
	8654	7.0	8.37	16.1	49.0	2.0	.	10	87	2	1	.	.	.
	8655	7.9	9.67	17.0	51.5	1.8	.	12	84	2	2	.	.	.
	8656	12.2	8.58	16.5	49.0	1.4	.	20	80	.	.	.	.	.
	8657	9.0	9.63	16.6	50.0	2.2	.	15	84	.	1	.	.	.
	MEAN	8.76	7.934	16.07	47.81	1.90								
	SE	0.63	0.486	0.24	1.00	0.20								
	N	8	8	8	8	8								
3000 PPM	8670	4.8	7.53	15.4	44.5	3.6	.	16	81	3	.	.	.	.
	8671	6.8	7.93	17.2	51.0	1.3	.	33	62	5	.	.	.	.
	8672	4.2	6.32	15.8	46.0	2.4	.	7	90	2	1	.	.	.
	8673	7.7	7.02	15.5	45.0	2.0	.	25	71	4	.	.	.	.
	8674	7.8	7.79	14.9	44.5	1.9	.	21	78	1	.	.	.	.
	8675	6.0	7.97	16.3	49.5	1.3	.	23	77	.	.	.	.	.
	8676	10.7	9.22	17.8	54.0	2.6	.	17	82	1	.	.	.	.
	8677	8.5	8.66	17.4	52.0	2.1	.	29	70	1	.	.	.	.
	MEAN	7.06	7.805	16.29	48.31	2.15								
	SE	0.74	0.318	0.38	1.54	0.26								
	N	8	8	8	8	8								

TABLE H-17 (CONTINUED)
INDIVIDUAL ANIMAL HEMATOLOGIES-FEMALES
INTERVAL OF STUDY= WEEK 12

DOSE GROUP	ANIMAL ID	WBC	RBC	HGB	HCT	RET	BN	SG	LY	MO	EO	BS	IM	OT
0 PPM	8695	5.9	6.59	16.3	47.0	1.0	.	21	78	.	1	.	.	.
	8696	7.0	6.68	15.4	45.5	0.8	.	27	68	3	2	.	.	.
	8697	11.7	6.64	14.7	44.0	2.0	.	14	86	.	.	.	.	.
	8698	7.3	6.85	15.2	46.0	1.6	.	33	62	2	3	.	.	.
	8699	3.2	7.43	16.2	49.0	2.8	.	19	81	.	.	.	.	.
	8700	3.7	8.74	16.6	50.5	2.0	.	19	79	1	1	.	.	.
	8701	5.5	7.67	17.2	51.5	3.6	.	25	75	.	.	.	.	.
	8702	4.3	7.53	14.6	45.0	1.6	.	16	83	1	.	.	.	.
	MEAN	6.07	7.266	15.77	47.31	1.92								
	SE	0.96	0.260	0.33	0.96	0.32								
	N	8	8	8	8	8								
300 PPM	8715	2.9	6.61	15.1	46.0	1.6	.	15	84	.	1	.	.	.
	8716	6.5	5.54	17.3	49.0	1.8	.	10	88	1	1	.	.	.
	8717	4.8	5.75	15.5	46.0	2.2	.	5	93	2	.	.	.	.
	8718	5.1	5.97	15.6	46.5	1.4	.	26	72	.	2	.	.	.
	8719	7.0	7.36	15.4	46.5	1.8	.	5	94	1	.	.	.	.
	8720	3.7	7.46	14.7	44.5	2.3	.	13	85	.	2	.	.	.
	8721	3.9	6.99	15.2	45.5	1.9	.	8	92	.	.	.	.	.
	8722	6.4	8.58	15.4	48.5	1.5	.	20	80	.	.	.	.	.
	MEAN	5.01	6.782	15.52	46.56	1.81								
	SE	0.52	0.363	0.27	0.53	0.11								
	N	8	8	8	8	8								

CLINICAL HEMATOLOGIES FOR P-1073415

TABLE H-17 (CONTINUED)
INDIVIDUAL ANIMAL HEMATOLOGIES-FEMALES
INTERVAL OF STUDY= WEEK 12

DOSE GROUP	ANIMAL NO	WBC	RBC	HGB	HCT	RET	BN	SG	LY	MO	EO	BS	IM	OT
1000 PPM	8735	5.4	5.27	14.9	41.0	2.4	.	28	72	.	.	.	.	.
	8736	3.8	5.99	15.4	45.0	3.4	.	24	76	.	.	.	.	.
	8737	7.5	6.10	15.2	44.0	2.2	.	8	91	1	.	.	.	.
	8738	3.4	6.30	16.6	50.5	2.6	.	17	81	.	2	.	.	.
	8739	5.8	7.87	15.2	46.0	2.5	.	21	78	.	1	.	.	.
	8740	6.1	8.07	15.4	45.5	2.7	.	23	77	.	.	.	.	.
	8741	4.4	7.19	15.3	46.0	1.6	.	22	78	.	.	.	.	.
	8742	7.0	8.13	17.1	50.5	1.8	.	28	72	.	.	.	.	.
	MEAN	5.42	6.865	15.64	46.06	2.40								
	SE	0.52	0.387	0.27	1.12	0.20								
	N	8	8	8	8	8								
5000 PPM	8755	5.2	6.87	15.4	44.0	1.5	.	29	69	1	1	.	.	.
	8756	4.6	5.04	15.2	45.0	1.2	.	18	80	1	1	.	.	.
	8757	3.8	5.89	15.5	43.0	1.9	.	13	85	2	.	.	.	.
	8758	8.4	8.11	17.6	55.0	0.9	.	15	82	3	.	.	.	.
	8759	5.3	7.75	15.4	46.0	1.7	.	17	81	1	1	.	.	.
	8760	6.2	7.38	14.8	44.0	2.5	.	24	75	.	1	.	.	.
	8761	6.6	7.91	14.9	45.0	1.9	.	17	83	.	.	.	.	.
	8762	6.2	7.05	15.4	45.5	1.0	.	12	87	.	1	.	.	.
	MEAN	5.54	7.000	15.52	45.69	1.57								
	SE	0.59	0.375	0.31	1.10	0.19								
	N	8	8	8	8	8								

LITTON BIONETICS, INC.
PROJECT NO. 10734-15

TABLE H-18

CLINICAL CHEMISTRY

KEY

BILI	=	Bilirubin, total	mg/dl
BUN	=	Blood Urea Nitrogen	mg/dl
CA	=	Calcium	mg/dl
CRTN	=	Creatinine	mg/dl
GLCS	=	Glucose	mg/dl
P	=	Phosphorus	mg/dl
SGOT	=	Serum Glutamic-oxaloacetic Transaminase	mU/ml
SGPT	=	Serum Glutamic-pyruvic Transaminase	mU/ml

I	=	Quantity not sufficient
L	=	Depleted substrate
M	=	Value questioned by computer
R	=	Repeat value

TABLE H-18 (CONTINUED)
INDIVIDUAL ANIMAL CHEMISTRIES-MALES
INTERVAL OF STUDY= WEEK 12

DOSE GROUP	ANIMAL NO	BILI	BUN	CA	CRTN	GLCS	P	SGOT	SGPT
0 PPM	8610	0.1	11	11.5	0.5	102	6.1	117	34
	8611	0.1	14	11.3	0.4	111	5.5	91	34
	8612	0.1	11	11.8	0.5	112	6.1	90	30
	8613	. I	. I	. I	. I	. I	. I	. I	. I
	8614	0.0	11	11.4	0.6	120	6.3	94	27
	8615	0.0 M	13	11.2	0.6	100	6.0	112	28
	8616	0.1	14	11.2	0.4	118	6.0	75	15
	8617	0.1	12	11.6	0.5	107	5.8	73	24
	MEAN	0.07	12.3	11.43	0.50	110.0	5.97	93.1	27.4
	SE	0.02	0.5	0.08	0.03	2.9	0.10	6.3	2.5
	N	7	7	7	7	7	7	7	7
500 PPM	8630	0.1	15	12.0	0.6	100	5.7	77	39
	8631	0.1	12	11.9	0.5	118	6.6	60	25
	8632	0.1	13	11.8	0.5	134	6.0	70	30
	8633	0.1	13	11.5	0.5	116	6.4	65	24
	8634	0.1	13	11.1	0.5	123	6.1	88	28
	8635	0.1	13	11.7	0.5	105	6.0	175	55
	8636	0.1	14	11.4	0.6	126	7.0	83	28
	8637	0.1	13	10.5	0.5	105	5.6	103	37
	MEAN	0.10	13.3	11.49	0.52	115.9	6.17	90.1	33.5
	SE	0.00	0.3	0.17	0.02	4.2	0.17	13.1	3.6
	N	8	8	8	8	8	8	8	8

TABLE H-18 (CONTINUED)
INDIVIDUAL ANIMAL CHEMISTRIES-MALES
INTERVAL OF STUDY= WEEK 12

DOSE GROUP	ANIMAL NO	BILI	BUN	CA	CHIN	GLCS	P	SGOT	SGPT
1000 PPM	8650	0.1	15	11.4	0.5	114	6.4	91	37
	8651	0.1	14	11.3	0.6	125	5.8	68	21
	8652	0.1	14	12.1	0.6	95	6.8	85	29
	8653	0.1	12	11.8	0.5	114	6.7	77	22
	8654	0.1	13	11.0	0.5	113	6.0	69	23
	8655	0.1	12	12.1	0.7	109	8.4	80	25
	8656	0.1	12	11.7	0.7	103	6.5	89	32
	8657	0.1	14	11.7	0.6	111	6.6	108	35
	MEAN	0.10	13.3	11.64	0.59	110.5	6.65	83.4	28.0
	SE	0.00	0.4	0.14	0.03	3.1	0.28	4.6	2.2
	N	8	8	8	8	8	8	8	8
5000 PPM	8670	0.1	10	11.6	0.6	109	7.2	66	16
	8671	0.1	13	12.3	0.5	114	6.1	90	74
	8672	0.1	13	11.4	0.5	101	6.7	77	19
	8673	0.1	10	11.7	0.5	109	6.6	98	36
	8674	0.1	12	10.8	0.5	114	5.8	106	29
	8675	0.1	13	11.2	0.6	103	6.3	96	29
	8676	0.0 M	13	12.2	0.6	112	6.6	90	34
	8677	0.1	15	11.8	0.6	109	7.7	126	41
	MEAN	0.09	12.1	11.62	0.55	108.9	6.62	93.6	34.8
	SE	0.01	0.5	0.16	0.02	1.7	0.21	6.4	6.3
	N	8	8	8	8	8	8	8	8

TABLE H-18 (CONTINUED)
INDIVIDUAL ANIMAL CHEMISTRIES-FEMALES
INTERVAL OF STUDY= WEEK 12

DOSE GROUP	ANIMAL NO	BILI	BUN	CA	CRTN	GLCS	P	SGOT	SGPT
0 PPM	8695	0.1	15	11.8	0.5	102	5.6	82	25
	8696	0.1	17	12.8	0.4	91	6.6	115	47
	8697	0.1	15	12.0	0.6	128	4.7	110	49
	8698	0.1	12	10.8	0.4	116	4.8	61	21
	8699	0.1	20	12.8	0.7	100	7.6	160	47
	8700	0.1	19	12.4	0.7	92	6.0	129	42
	8701	0.1	16	11.4	0.6	90	7.6	111	20
	8702	0.1	14	11.6	0.6	100	5.5	122	42
	MEAN	0.10	16.0	11.95	0.56	102.4	6.05	111.3	36.6
	SE	0.00	0.9	0.25	0.04	4.7	0.40	10.5	4.4
	N	8	8	8	8	8	8	8	8
300 PPM	8715	0.1	15	10.9	0.6	130	4.9	79	36
	8716	0.1	18	12.9	0.6	87	7.8	143	46
	8717	0.1	12	11.7	0.5	111	5.3	74	24
	8718	0.1	15	12.7	0.6	117	5.7	93	24
	8719	0.1	16	11.6	0.6	104	4.9	77	20
	8720	0.2	15	11.7	0.7	118	5.5	385	74
	8721	0.2	19	11.9	0.8	117	5.0	155	75
	8722	0.1	16	11.1	0.6	107	4.1	90	25
	MEAN	0.12	15.8	11.81	0.62	111.4	5.40	137.0	40.5
	SE	0.02	0.8	0.25	0.03	4.5	0.38	37.1	8.0
	N	8	8	8	8	8	8	8	8

TABLE H-18 (CONTINUED)
INDIVIDUAL ANIMAL CHEMISTRIES-FEMALES
INTERVAL OF STUDY= WEEK 12

DOSE GROUP	ANIMAL NO	BILI	BUN	CA	CR/N	GLCS	P	SGOT	SGPT
1000 PPM	8735	0.1	15	11.6	0.6	102	5.3	80	39
	8736	0.1	17	11.5	0.7	121	3.6	97	37
	8737	0.2	13	12.3	0.4	122	5.5	77	29
	8738	0.1	14	11.8	0.7	106	6.2	60	21
	8739	0.1	13	12.5	0.7	93	8.4	110	38
	8740	0.1	14	12.2	0.6	97	5.0	120	60
	8741	0.2 M	14	11.9	0.6	116	3.9	126	47
	8742	0.2	12	12.5	0.6	92	6.9	165R	120R
	MEAN	0.14	14.0	12.04	0.61	106.1	5.60	104.4	48.9
	SE	0.02	0.5	0.14	0.04	4.3	0.55	11.8	11.0
	N	8	8	8	8	8	8	8	8
5000 PPM	8755	0.1	14	11.3	0.5	101	5.5	66	18
	8756	0.1 M	15	12.2	0.7	113	5.2	85R	32
	8757	0.1	14	12.0	0.6	104	5.2	96	25
	8758	0.0	13	12.1	0.6	83	8.0	. L	31
	8759	0.1	13	11.9	0.6	112	6.2	104	31
	8760	0.1	15	11.7	0.6	96	5.3	126	54
	8761	0.1	11	12.4	0.5	100	5.8	88	22
	8762	0.1	15	11.5	0.7	89	6.6	107	19
	MEAN	0.09	13.8	11.89	0.60	99.8	5.97	96.0	29.0
	SE	0.01	0.5	0.13	0.03	3.7	0.34	7.2	4.1
	N	8	8	8	8	8	8	7	8

TABLE H-19
PROJECT NO. 1073415
ORGAN WEIGHTS IN MALE RATS (GRAMS)
DOSE - CONTROL
GROUP - 1
TERMINAL KILL

ANIMAL NUMBER	BODY WEIGHT	BRAIN	HEART	THYROID	SPLEEN	ADRE'LS	LIVER	KIDNEYS	TESTES
8610	484.0	2.1170	1.6460	0.0210	0.7680	0.0480	14.9970	3.7040	3.8070
8611	454.0	2.1490	1.6530	0.0320	0.7950	0.0610	13.8000	3.2440	3.0380
8612	481.0	2.2900	1.4570	0.0340	0.9040	0.0620	16.2310	3.8730	3.3810
8613	464.0	2.1840	1.8470	0.0340	0.6760	0.0680	17.5760	3.6650	3.6250
8614	501.0	2.0990	1.4430	0.0340	0.6630	0.0680	15.7560	3.8460	3.1700
8615	374.0	2.1070	1.3490	0.0100	0.6380	0.0550	14.0390	3.1660	3.2660
8616	437.0	2.0550	1.7350	0.0300	0.7700	0.0600	14.0400	3.8660	3.8690
8617	460.0	2.0480	1.6920	0.0140	0.7440	0.0460	14.1700	3.9560	3.5380
8618	502.0	2.0510	1.6880	0.0250	0.6750	0.0710	16.6960	4.6000	3.6600
8619	512.0	2.2040	1.7520	0.0350	0.8990	0.0620	16.7170	4.0380	3.3570
8620	466.0	2.0710	1.4720	0.0300	0.7570	0.0450	17.6140	4.0620	3.6000
8621	495.0	2.2370	1.7260	0.0130	0.8010	0.0700	17.0460	4.0750	3.5560
8622	478.0	2.2200	1.5460	0.0420	0.8400	0.0750	16.6150	3.9940	3.3520
8623	463.0	2.1330	1.7040	0.0360	0.7510	0.0690	15.9280	4.1600	3.8000
8624	504.0	2.0720	1.7410	0.0400	0.8300	0.0760	19.8310	5.7760	3.5600
8625	395.0	2.0780	1.3360	0.0310	0.6510	0.0740	12.6320	3.1990	3.4980
8626	455.0	2.2460	1.7980	0.0190	0.9110	0.0480	17.8710	3.4370	3.2870
8627	509.0	2.2980	2.0460	0.0240	0.8960	0.0570	17.0570	3.7970	3.5670
8628	479.0	1.9060	1.6180	0.0380	0.6270	0.0540	14.2190	3.9300	3.2940
8629	424.0	2.0160	1.5770	0.0160	0.7230	0.0710	15.1830	3.2500	3.4740
N	20	20	20	20	20	20	20	20	20
MEAN	466.8	2.1290	1.6413	0.0279	0.7659	0.0618	15.9009	3.7819	3.4849
S.D.	37.0	0.0996	0.1735	0.0096	0.0932	0.0104	1.8569	0.3692	0.2179
S.E.	8.3	0.0223	0.0388	0.0021	0.0208	0.0023	0.4152	0.0825	0.0487

TABLE H-19 (CONTINUED)
PROJECT NO. 1073415
ORGAN WEIGHTS IN MALE RATS (GRAMS)
DOSE - 300 PPM
GROUP - 2
TERMINAL KILL

ANIMAL NUMBER	BODY WEIGHT	BRAIN	HEART	THYROID	SPLEEN	ADRE'LS	LIVER	KIDNEYS	TESTES
8630	472.0	2.3310	1.6600	0.0200	0.7360	0.0650	15.7070	3.9460	3.5500
8631	460.0	2.2220	1.5990	0.0300	1.0340	0.0780	15.5180	4.4190	3.4120
8632	486.0	2.1500	1.8470	0.0330	0.8480	0.0850	15.6570	3.5440	3.3830
8633	453.0	2.3360	1.5670	0.0390	0.7450	0.0660	14.3000	3.9520	3.2180
8634	459.0	2.0420	1.6400	0.0220	0.8750	0.0560	16.8930	4.3670	4.2000
8635	455.0	2.0930	1.6010	0.0180	0.6580	0.0500	13.9470	3.4570	4.4000
8636	471.0	2.1780	1.6890	0.0240	0.6800	0.0890[a]	17.2140	4.0220	4.1000
8637	411.0	2.0480	1.5330	0.0240	0.7520	0.0770	13.3820	3.8480	3.6700
8638	471.0	2.0740	1.5520	0.0300	0.6550	0.0580	16.7890	4.0810	3.4400
8639	503.0	2.0600	1.6520	0.0290	0.7350	0.0610	17.7100	4.2740	3.8170
8640	414.0	2.1210	1.4760	0.0220	0.7450	0.0540	15.2580	3.5830	3.3330
8641	538.0	2.2740	1.7620	0.0170	1.0580	0.0730	17.2380	4.4410	3.6690
8642	429.0	2.1730	1.7820	0.0310	0.7080	0.0590	15.5900	3.6600	3.5050
8643	536.0	2.2680	1.7750	0.0460	0.9900	0.0980	18.1750	4.3380	3.7870
8644	369.0	2.1170	1.4320	0.0310	0.5450	0.0660	13.7170	3.0850	3.4880
8645	489.0	1.9600	1.4530	0.0310	0.7070	0.0920	20.2840	4.3390	3.9210
8646	461.0	2.1190	1.6110	0.0360	0.9360	0.0670	20.6370	3.6800	3.4270
8647	444.0	2.2120	1.9430	0.0390	0.7330	0.0920	16.8230	4.2200	3.3150
8648	485.0	2.1420	2.0300	0.0120	0.7680	0.0690	19.5370	3.7020	3.9100
8649	462.0	2.1590	2.0000	0.0220	0.7520	0.0790	18.2090	4.0190	3.2710
N	20	20	20	20	20	19	20	20	20
MEAN	463.4	2.1539	1.6802	0.0278	0.7830	0.0711	16.6292	3.9488	3.6408
S.D.	39.8	0.0987	0.1738	0.0085	0.1338	0.0135	2.0826	0.3743	0.3306
S.E.	8.9	0.0221	0.0389	0.0019	0.0299	0.0031	0.4657	0.0837	0.0739

[a]Organ weight taken after fixation; deleted from statistical calculation.

TABLE H-19 (CONTINUED)
PROJECT NO. 1073415
ORGAN WEIGHTS IN MALE RATS (GRAMS)
DOSE = 1000 PPM
GROUP = 5
TERMINAL KILL

ANIMAL NUMBER	BODY WEIGHT	BRAIN	HEART	THYROID	SPLEEN	ADRENALS	LIVER	KIDNEYS	TESTES
8650	447.0	2.1510	1.9780	0.0270	0.6940	0.0670	13.9590	3.5400	4.0260
8651	540.0	2.0720	1.8670	0.0220	0.9430	0.0610	17.3070	4.5090	3.4650
8652	412.0	2.0200	1.3890	0.0160	0.6910	0.0830	13.6830	3.6000	3.5850
8653	453.0	1.9600	1.6960	0.0410	0.7530	0.0430	18.6780	3.9610	3.5830
8654	447.0	1.9980	1.6810	0.0300	0.7600	0.0810	14.7000	3.9130	3.6920
8655	463.0	2.3000	1.4530	0.0360	0.6300	0.0710	13.6980	3.7780	3.1320
8656	521.0	2.2900	1.6700	0.0180	0.9730	0.0660	19.2630	4.6490	3.2750
8657	452.0	2.2000	1.5830	0.0240	0.8780	0.0650	15.9290	3.5540	3.6370
8658	489.0	2.0960	2.3140	0.0300	0.7150	0.0410	19.8060	3.9990	3.5490
8659	488.0	2.1250	1.8300	0.0230	0.6070	0.0520	17.8620	4.1030	3.4230
8660	468.0	2.1590	1.5970	0.0420	0.7520	0.0790	15.0390	4.0220	3.5850
8661	482.0	2.0010	1.5540	0.0220	0.8150	0.0710	17.9460	4.7820	3.8500
8662	492.0	2.2190	1.6560	0.0160	0.9010	0.0680	20.7300	4.4550	3.6150
8663	422.0	2.1500	1.2930	0.0730	0.7960	0.0990	12.0320	3.2100	3.5130
8664	502.0	2.2130	1.9480	0.0280	0.9490	0.0900	18.5140	3.8620	3.2870
8665	547.0	2.3410	1.9040	0.0230	0.9520	0.0680	21.7230	4.5070	3.5790
8666	470.0	2.2420	1.6670	0.0150	0.9440	0.0490	17.7350	3.6040	3.9020
8667	498.0	0.0 [d]	1.9450	0.0440	0.6570	0.1010	18.9860	5.3290	3.6240
8668	515.0	2.1260	1.6930	0.0330	0.9080	0.0550	18.3440	4.2220	3.3060
8669	553.0	1.9670	1.7620	0.0370	0.8250	0.0820	18.6570	4.5520	3.4710
N	20	19	20	20	20	20	20	20	20
MEAN	483.0	2.1384	1.7240	0.0300	0.8071	0.0696	17.2295	4.1075 *	3.5449
S.D.	39.4	0.1149	0.2326	0.0135	0.1186	0.0169	2.6173	0.5173	0.2201
S.E.	8.8	0.0264	0.0520	0.0030	0.0265	0.0038	0.5852	0.1157	0.0492

*p<0.05 as compared to controls: Dunnett's t-test.
[d]Organ weight not taken.

TABLE H-19 (CONTINUED)
PROJECT NO. 1073415
ORGAN WEIGHTS IN MALE RATS (GRAMS)
DOSE = 3000 PPM
GROUP = 4
TERMINAL KILL

ANIMAL NUMBER	BODY WEIGHT	BRAIN	HEART	THYROID	SPLEEN	ADRE'LS	LIVER	KIDNEYS	TESTES
8670	416.0	2.1360	1.6130	0.0370	0.7410	0.0550	13.2730	3.3200	3.4930
8671	446.0	2.1260	1.6880	0.0220	0.8510	0.0580	14.2320	3.9430	3.6330
8672	418.0	2.3360	1.6080	0.0300	0.6890	0.0820	13.5570	3.9070	4.1280
8673	503.0	2.0960	1.7740	0.0450	0.7730	0.0620	16.5000	3.9230	3.4910
8674	506.0	2.0570	2.0080	0.0360	0.7280	0.0550	16.0500	4.2490	3.5800
8675	424.0	2.1320	1.7400	0.0270	0.8940	0.0730	15.6800	4.2740	3.7000
8676	457.0	2.0990	1.5880	0.0280	0.9450	0.0510	17.3180	4.0690	2.9470
8677	404.0	2.1040	1.6720	0.0270	0.6750	0.0760	13.8190	3.7810	3.7610
8678	463.0	1.9970	1.6110	0.0200	0.7590	0.0450	17.6250	3.7580	3.7570
8679	435.0	2.3210	1.4740	0.0320	0.6850	0.0650	13.0360	3.5640	3.7390
8680	429.0	2.1620	1.6010	0.0380	0.7450	0.0550	15.3300	3.8990	3.4100
8681	444.0	2.0400	1.6000	0.0180	0.7080	0.0460	15.2840	3.3800	3.4550
8682	454.0	2.1750	1.4150	0.0250	0.8200	0.0540	17.8540	3.7110	3.5200
8683	448.0	2.1190	1.5050	0.0290	0.5870	0.0720	16.5540	3.8590	3.1140
8684	402.0	2.0610	1.7080	0.0170	0.6590	0.0430	13.7750	3.2780	6.0570
8685	368.0	2.0580	1.3400	0.0270	0.6110	0.0730	16.5170	3.6430	3.4030
8686	429.0	2.2230	1.5640	0.0420	0.6890	0.0740	15.0270	3.7260	3.4460
8687	429.0	2.1870	1.6000	0.0200	0.6610	0.0660	16.3260	4.0030	4.0530
8688	503.0	2.2050	1.6790	0.0150	0.7430	0.1370	18.9940	4.6950	3.5000
8689	369.0	2.2190	1.5250	0.0270	0.7470	0.0550	15.0730	3.6800	3.4090
N	20	20	20	20	20	20	20	20	20
MEAN	438.3	2.1436	1.6156	0.0281	0.7355	0.0648	15.4912	3.8331	3.6797
S.D.	36.7	0.0887	0.1408	0.0083	0.0895	0.0204	1.7520	0.5379	0.6213
S.E.	8.2	0.0198	0.0315	0.0019	0.0200	0.0046	0.3918	0.0755	0.1389

TABLE H-19 (CONTINUED)
PROJECT NO. 1073415
ORGAN WEIGHTS IN FEMALE RATS (GRAMS)
DOSE - CONTROL
GROUP - 1
TERMINAL KILL

ANIMAL NUMBER	BODY WEIGHT	BRAIN	HEART	THYROID	SPLEEN	ADRE'LS	LIVER	KIDNEYS	OVARIES
8695	249.0	1.8630	0.9330	0.0210	0.6280	0.0850	8.9540	2.1910	0.1410
8696	0.0[b]	1.9350	0.9760	0.0200	0.5770	0.0950	8.7570	2.2090	0.1540
8697	272.0	2.0750	0.9920	0.0330	0.9400	0.0570	10.1510	2.3650	0.1220
8698	275.0	1.9490	1.0490	0.0240	0.7840	0.0670	8.3700	2.1150	0.1520
8699	266.0	2.0370	0.9960	0.0350	0.7420	0.0940	9.9790	2.2630	0.1320
8700	296.0	1.8350	1.0110	0.0170	0.6950	0.0740	11.1960	2.3090	0.1530
8701	231.0	2.0150	0.9070	0.0260	0.6060	0.0770	8.9000	2.2670	0.1170
8702	228.0	1.8800	1.0100	0.0170	0.4100	0.0710	8.7510	2.3480	0.1430
8703	241.0	1.9030	0.9230	0.0350	0.5030	0.0880	8.2990	2.1110	0.0660
8704	273.0	2.0290	1.0300	0.0300	0.4810	0.0650	8.5930	2.4800	0.1370
8705	239.0	1.8560	0.9940	0.0170	0.4410	0.0690	8.5840	2.5310	0.1060
8706	249.0	1.9570	0.9200	0.0160	0.5430	0.0990	7.4820	1.9480	0.1990
8707	234.0	2.0370	0.8790	0.0210	0.3400	0.0700	8.1070	2.0970	0.1230
8708	248.0	1.8890	0.9370	0.0480	0.5960	0.0530	10.4750	2.2950	0.2090
8709	245.0	2.0280	1.0750	0.0190	0.5240	0.0740	8.9190	2.1790	0.1710
8710	256.0	1.7990	1.1370	0.0200	0.4920	0.0850	10.1710	2.3450	0.1890
8711	210.0	2.0750	0.7500	0.0190	0.5680	0.0890	8.4440	1.8850	0.1310
8712	216.0	1.9440	0.9020	0.0220	0.4500	0.0740	8.6220	2.0130	0.1120
8713	234.0	1.9610	0.9280	0.0340	0.4380	0.1300	8.4480	2.2600	0.1360
8714	237.0	1.9230	1.1070	0.0180	0.5040	0.0730	9.2700	2.3040	0.1350
N	19	20	20	20	20	20	20	20	20
MEAN	247.3	1.9495	0.9728	0.0246	0.5651	0.0794	9.0236	2.2157	0.1414
S.D.	21.6	0.0819	0.0878	0.0085	0.1423	0.0172	0.9159	0.1502	0.0331
S.E.	5.0	0.0183	0.0196	0.0019	0.0318	0.0038	0.2048	0.0336	0.0074

[b]Body weight not taken.

TABLE H-19 (CONTINUED)
PROJECT NO. 1073415
ORGAN WEIGHTS IN FEMALE RATS (GRAMS)
DOSE - 300 PPM
GROUP - 2
TERMINAL KILL

ANIMAL NUMBER	BODY WEIGHT	BRAIN	HEART	THYROID	SPLEEN	ADRE'LS	LIVER	KIDNEYS	OVARIES
8715	243.0	1.8290	1.0100	0.0310	0.5030	0.0640	9.9610	2.2960	0.1180
8716	243.0	1.9910	0.9980	0.0370	0.6220	0.0770	8.8970	2.0690	0.1290
8717	260.0	2.1560	1.3260	0.0280	0.5890	0.0860	7.8640	2.5340	0.1370
8718	283.0	1.9360	1.0420	0.0250	0.5840	0.0660	10.9250	2.1480	0.1420
8719	241.0	1.9550	1.1080	0.0250	0.5660	0.0760	9.8260	2.4900	0.1420
8720	240.0	1.9590	0.8970	0.0240	0.6520	0.0830	9.8900	2.1230	0.1130
8721	255.0	1.9590	1.2300	0.0290	0.5990	0.0820	9.9770	1.9440	0.1390
8722	208.0	2.1290	1.0880	0.0730	0.6780	0.0680	8.4960	2.3020	0.1250
8723	259.0	1.9220	1.0780	0.0150	0.6330	0.0670	9.0770	2.6460	0.0900
8724	220.0	1.9660	0.9440	0.0310	0.4620	0.1100	7.7070	2.0240	0.1330
8725	241.0	1.9340	1.0840	0.0140	0.5300	0.0710	8.6730	2.1440	0.1350
8726	297.0	2.0140	1.2260	0.0300	0.6900	0.0930	15.0210	3.5490	0.1110
8727	223.0	1.8930	0.8630	0.0120	0.4180	0.0880	7.5890	2.1650	0.0820
8728	277.0	1.9170	1.0090	0.0370	0.7250	0.0360	10.0580	2.3440	0.1300
8729	266.0	1.9140	0.9860	0.0250	0.5290	2.0720[a]	8.5850	2.3450	0.1040
8730	305.0	2.1120	1.1320	0.0250	0.6970	0.0890	11.1970	2.8890	0.1280
8731	218.0	1.8970	0.9130	0.0430	0.4660	0.0720	8.4350	2.4320	0.0920
8732	281.0	2.0690	1.2330	0.0180	0.6290	0.0960	10.7040	2.6470	0.1990
8733	245.0	1.9600	1.0590	0.0140	0.4960	0.1060	9.4790	2.1130	0.1860
8734	266.0	1.9480	1.0340	0.0430	0.6550	0.1000	9.8440	2.5050	0.0690
N	20	20	20	20	20	19	20	20	20
MEAN	253.4	1.9740	1.0620*	0.0289	0.5861	0.0805	9.5102	2.3853	0.1252
S.D.	26.4	0.0856	0.1219	0.0138	0.0875	0.0174	1.3305	0.3659	0.0312
S.E.	5.9	0.0191	0.0273	0.0031	0.0196	0.0039	0.2975	0.0818	0.0070

*p<0.05 as compared to controls: Dunnett's t-test.

[a]Weight judged erroneous. Omitted from statistics.

TABLE H-19 (CONTINUED)
PROJECT NO. 1073415
ORGAN WEIGHTS IN FEMALE RATS (GRAMS)
DOSE = 1000 PPM
GROUP = 3
TERMINAL KILL

ANIMAL NUMBER	BODY WEIGHT	BRAIN	HEART	THYROID	SPLEEN	ADRE'LS	LIVER	KIDNEYS	OVARIES
8735	243.0	2.0690	1.0440	0.0180	0.5670	0.0570	9.6580	2.3070	0.1470
8736	250.0	1.9730	0.9510	0.0450	0.5480	0.0610	10.6810	2.2150	0.1180
8737	281.0	2.0410	1.0160	0.0360	0.7240	0.0940	8.8490	2.4430	0.1540
8738	292.0	1.9010	0.9460	0.0210	0.5750	0.1150	10.9610	2.4390	0.1850
8739	210.0	1.9650	0.9190	0.0130	0.6750	0.0630	7.3490	1.9960	0.1370
8740	231.0	2.0890	1.0510	0.0250	0.7840	0.0730	6.6460	2.2050	0.1420
8741	237.0	2.0360	1.0430	0.0130	0.6400	0.0660	10.5260	2.3000	0.1520
8742	251.0	2.0620	1.1350	0.0090	0.6050	0.0910	11.4920	2.7560	0.1970
8743	297.0	2.0220	1.2410	0.0350	0.0[c]	0.0990	11.0870	2.7250	0.1710
8744	245.0	2.0690	1.0100	0.0250	0.6900	0.0610	8.8600	2.1540	0.1270
8745	219.0	2.0820	0.9470	0.0140	0.3880	0.0780	8.2620	2.3570	0.1520
8746	274.0	1.9440	1.2190	0.0140	0.4990	0.0860	10.3000	2.7210	0.1450
8747	234.0	2.0390	1.1440	0.0270	0.4840	0.0600	9.1820	2.6110	0.1520
8748	270.0	2.0700	1.0650	0.0270	0.6770	0.0900	10.8160	2.7120	0.2130
8749	234.0	1.9160	0.9560	0.0270	0.5230	0.0890	9.1300	2.3100	0.1330
8750	257.0	1.9760	0.9060	0.0180	0.6570	0.0850	10.0330	2.4920	0.1160
8751	216.0	1.5010	1.0350	0.0330	0.4830	0.0860	7.4600	1.9250	0.1240
8752	266.0	1.9380	1.1210	0.0190	0.5050	0.0790	10.1620	2.3910	0.1590
8753	288.0	1.9560	1.0710	0.0360	0.5730	0.0550	10.8200	2.7720	0.0900
8754	242.0	1.9740	0.9730	0.0290	0.5040	0.1060	9.3070	2.6310	0.1650
N	20	20	20	20	19	20	20	20	20
MEAN	251.8	1.9812	1.0395	0.0242	0.5843	0.0797	9.5790	2.4231*	0.1489
S.D.	25.6	0.1275	0.0950	0.0096	0.1002	0.0173	1.3646	0.2534	0.0287
S.E.	5.7	0.0285	0.0212	0.0022	0.0230	0.0039	0.3051	0.0567	0.0064

*p<0.05 as compared to controls: Dunnett's t-test.
[c]Organ lost; weight not taken.

TABLE H-19 (CONTINUED)
PROJECT NO. 1073415
ORGAN WEIGHTS IN FEMALE RATS (GRAMS)
DOSE - 3000 PPM
GROUP - 4
TERMINAL KILL

ANIMAL NUMBER	BODY WEIGHT	BRAIN	HEART	THYROID	SPLEEN	ADRENALS	LIVER	KIDNEYS	OVARIES
8755	203.0	1.8450	0.9170	0.0190	0.4560	0.0560	7.7420	1.8800	0.1360[a]
8756	272.0	1.9860	1.1890	0.0340	0.6830	0.0820	9.7360	2.7700	0.1360
8757	257.0	2.0490	1.0200	0.0160	0.5110	0.1000	8.9960	2.3340	0.1010
8758	216.0	1.9260	0.8720	0.0160	0.6300	0.0560	7.5820	1.9040	0.1440
8759	229.0	2.0340	1.0540	0.0190	0.5700	0.1080	8.3740	2.2940	0.1450
8760	252.0	2.0250	0.9720	0.0180	0.7530	0.0570	9.0540	2.2780	0.0640
8761	255.0	1.9780	1.1570	0.0430	0.6690	0.0730	7.9370	2.4830	0.1350
8762	245.0	2.0040	1.2420	0.0120	0.5780	0.0710	8.1230	2.1760	0.1520
8763	238.0	1.9040	1.0430	0.0160[a]	0.4420	0.0650	8.2510	2.3570	0.1300
8764	251.0	1.8690	0.9860	0.0180	0.5460	0.0730	9.0870	2.3020	0.1620
8765	199.0	1.8730	0.8280	0.0150	0.4910	0.0910	7.3530	2.0920	0.1080
8766	262.0	1.9760	1.0730	0.0290	0.6560	0.0910	9.2050	2.5340	0.1070
8767	211.0	1.8670	0.7510	0.0200	0.4280	0.0710	8.3760	2.0630	0.1110
8768	209.0	1.9580	1.0060	0.0210	0.4750	0.0840[a]	7.5560	2.1910	0.1360[a]
8769	230.0	2.0680	0.9870	0.0080	0.4860	0.0750	7.8610	2.3220	0.0540
8770	255.0	2.0270	1.1560	0.0120	0.4600	0.0960	10.0380	2.2810	0.1160
8771	249.0	2.0350	0.9140	0.0350	0.6220	0.1070	8.0890	2.3140	0.1600
8772	236.0	2.0490[a]	1.1290	0.0190	0.6610	0.0670	7.9540	2.2700	0.1650
8773	211.0	1.8600	1.0060	0.0210	0.4740	0.0990	6.0160	2.1140	0.1210
8774	245.0	1.9950	1.0110	0.0340	0.4610	0.0920	10.3560	2.7480	0.1060
N	20	19	20	19	20	19	20	20	18
MEAN	238.1	1.9619	1.0145	0.0215	0.5526	0.0805	8.3843	2.2893	0.1232
S.D.	24.1	0.0728	0.1222	0.0092	0.0976	0.0171	1.0179	0.2302	0.0311
S.E.	5.4	0.0167	0.0273	0.0021	0.0218	0.0039	0.2276	0.0515	0.0073

[a]Organ weight taken after fixation; deleted from statistical calculation.

TABLE H-20
PROJECT NO. 1073415
ORGAN WEIGHT-BODY WEIGHT PERCENTAGES IN MALE RATS
DOSE - CONTROL
GROUP - 1
TERMINAL KILL

ANIMAL NUMBER	BRAIN	HEART	THYROID	SPLEEN	ADRE'LS	LIVER	KIDNEYS	TESTES
8610	0.4374	0.3401	0.0043	0.1587	0.0099	3.0986	0.7653	0.7866
8611	0.4733	0.3641	0.0070	0.1751	0.0134	3.0396	0.7145	0.6692
8612	0.4761	0.3029	0.0071	0.1879	0.0129	3.3744	0.8052	0.7029
8613	0.4707	0.3981	0.0073	0.1457	0.0147	3.7879	0.7899	0.7813
8614	0.4190	0.2880	0.0068	0.1323	0.0136	3.1449	0.7677	0.6327
8615	0.5634	0.3607	0.0027	0.1706	0.0142	3.7537	0.8465	0.8733
8616	0.4703	0.3970	0.0069	0.1762	0.0137	3.2128	0.8047	0.8854
8617	0.4452	0.3678	0.0030	0.1617	0.0100	3.0804	0.8600	0.7691
8618	0.4086	0.3563	0.0050	0.1345	0.0141	3.3259	0.9163	0.7291
8619	0.4305	0.3422	0.0068	0.1756	0.0121	3.2650	0.7887	0.6557
8620	0.4444	0.3159	0.0064	0.1624	0.0092	3.7798	0.8717	0.7725
8621	0.4519	0.3487	0.0026	0.1618	0.0141	3.4436	0.8232	0.7184
8622	0.4644	0.3234	0.0088	0.1757	0.0157	3.4759	0.8356	0.7013
8623	0.4607	0.3680	0.0078	0.1622	0.0149	3.4402	0.8985	0.8207
8624	0.4111	0.3454	0.0079	0.1647	0.0151	3.9347	0.7492	0.7063
8625	0.5261	0.3382	0.0078	0.1648	0.0187	3.1980	0.8099	0.8856
8626	0.4936	0.3952	0.0042	0.2002	0.0105	3.9277	0.7554	0.7224
8627	0.4515	0.4020	0.0047	0.1760	0.0112	3.3511	0.7460	0.7008
8628	0.3979	0.3378	0.0079	0.1309	0.0113	2.9685	0.8205	0.6877
8629	0.4755	0.3719	0.0038	0.1705	0.0167	3.1092	0.7665	0.8193
N	20	20	20	20	20	20	20	20
MEAN	0.4586	0.3522	0.0059	0.1644	0.0133	3.3856	0.8108	0.7510
S.D.	0.0395	0.0318	0.0020	0.0178	0.0024	0.3036	0.0561	0.0758
S.E.	0.0088	0.0071	0.0004	0.0040	0.0005	0.0679	0.0125	0.0169

TABLE H-20 (CONTINUED)
PROJECT NO. 1073415
ORGAN WEIGHT-BODY WEIGHT PERCENTAGES IN MALE RATS
DOSE = 300 PPM
GROUP = 2
TERMINAL KILL

ANIMAL NUMBER	BRAIN	HEART	THYROID	SPLEEN	ADRE'LS	LIVER	KIDNEYS	TESTES
8630	0.4939	0.3517	0.0042	0.1559	0.0158	3.3278	0.8360	0.7521
8631	0.4850	0.3476	0.0065	0.2248	0.0170	3.3735	0.9607	0.7417
8632	0.4424	0.3800	0.0068	0.1745	0.0175	3.2216	0.7292	0.6961
8633	0.5157	0.3459	0.0086	0.1645	0.0146	3.1567	0.8724	0.7104
8634	0.4449	0.3575	0.0048	0.1906	0.0122	3.6804	0.9514	0.9150
8635	0.4600	0.3519	0.0040	0.1446	0.0110	3.0653	0.7598	0.9670
8636	0.4624	0.3586	0.0051	0.1444	0.0189 [a]	3.6548	0.8539	0.8705
8637	0.4983	0.3730	0.0058	0.1830	0.0187	3.2560	0.9363	0.8929
8638	0.4403	0.3295	0.0064	0.1391	0.0123	3.5645	0.8665	0.7304
8639	0.4095	0.3284	0.0058	0.1461	0.0121	3.5209	0.8497	0.7588
8640	0.5123	0.3565	0.0053	0.1800	0.0143	3.6855	0.8655	0.8051
8641	0.4227	0.3275	0.0032	0.1967	0.0136	3.2041	0.8255	0.6820
8642	0.5065	0.4154	0.0072	0.1650	0.0138	3.6540	0.8531	0.8170
8643	0.4231	0.3312	0.0086	0.1847	0.0183	3.3909	0.8093	0.7065
8644	0.5737	0.3881	0.0084	0.1477	0.0179	3.7173	0.8360	0.9453
8645	0.4008	0.2971	0.0063	0.1446	0.0188	4.1481	0.8873	0.8018
8646	0.4597	0.3495	0.0078	0.2030	0.0145	4.4766	0.7983	0.7434
8647	0.4982	0.4376	0.0088	0.1651	0.0207	3.7890	0.9505	0.7406
8648	0.4416	0.4186	0.0025	0.1584	0.0142	4.0282	0.7633	0.8062
8649	0.4673	0.4329	0.0048	0.1628	0.0171	3.9413	0.8699	0.7080
N	20	20	20	20	19	20	20	20
MEAN	0.4678	0.3639	0.0060	0.1688	0.0154	3.5918	0.8537	0.7898
S.D.	0.0426	0.0579	0.0018	0.0231	0.0028	0.3636	0.0641	0.0866
S.E.	0.0095	0.0085	0.0004	0.0052	0.0006	0.0813	0.0143	0.0194

[a]Organ weight taken after fixation; deleted from statistical calculation.

TABLE H-20 (CONTINUED)
PROJECT NO. 1073415
ORGAN WEIGHT-BODY WEIGHT PERCENTAGES IN MALE RATS
DOSE = 1000 PPM
GROUP = 3
TERMINAL KILL

ANIMAL NUMBER	BRAIN	HEART	THYROID	SPLEEN	ADRE'LS	LIVER	KIDNEYS	TESTES
8650	0.4812	0.4425	0.0060	0.1553	0.0150	3.1228	0.7919	0.9007
8651	0.3837	0.3457	0.0041	0.1746	0.0113	3.2050	0.8350	0.6417
8652	0.4903	0.3371	0.0039	0.1677	0.0201	3.3211	0.8738	0.8701
8653	0.4327	0.3744	0.0091	0.1662	0.0095	4.1232	0.8744	0.7909
8654	0.4470	0.3761	0.0067	0.1700	0.0181	3.2886	0.8754	0.8260
8655	0.4968	0.3138	0.0078	0.1561	0.0153	2.9585	0.8160	0.6765
8656	0.4395	0.3205	0.0035	0.1868	0.0127	3.6973	0.8923	0.6286
8657	0.4867	0.3502	0.0053	0.1942	0.0144	3.5241	0.7863	0.8046
8658	0.4286	0.4732	0.0061	0.1462	0.0084	4.0503	0.8178	0.7258
8659	0.4355	0.3750	0.0047	0.1244	0.0107	3.6602	0.8408	0.7014
8660	0.4613	0.3412	0.0090	0.1607	0.0169	3.2135	0.8594	0.7660
8661	0.4151	0.3224	0.0046	0.1691	0.0147	3.7232	0.9921	0.7988
8662	0.4510	0.3366	0.0053	0.1831	0.0138	4.2134	0.9055	0.7348
8663	0.5095	0.3064	0.0175	0.1886	0.0235	2.8512	0.7607	0.8325
8664	0.4408	0.3880	0.0056	0.1890	0.0179	3.6880	0.7693	0.6548
8665	0.4280	0.3481	0.0042	0.1740	0.0124	3.9713	0.8239	0.6177
8666	0.4770	0.3547	0.0052	0.2009	0.0104	3.7734	0.7668	0.8302
8667	0.0[d]	0.3906	0.0088	0.1319	0.0203	3.8124	1.0701	0.7277
8668	0.4128	0.3287	0.0064	0.1765	0.0107	3.5619	0.8198	0.6419
8669	0.3557	0.3186	0.0067	0.1492	0.0148	3.3738	0.8231	0.6277
N	19	20	20	20	20	20	20	20
MEAN	0.4460	0.3572	0.0063	0.1672	0.0145	3.5567	0.8497	0.7399
S.D.	0.0393	0.0426	0.0032	0.0213	0.0040	0.3841	0.0758	0.0889
S.E.	0.0090	0.0095	0.0007	0.0048	0.0009	0.0859	0.0169	0.0199

[d]Organ weight not taken.

TABLE H-20 (CONTINUED)
PROJECT NO. 1073415
ORGAN WEIGHT-BODY WEIGHT PERCENTAGES IN MALE RATS
DOSE = 3000 PPM
GROUP = 4
TERMINAL KILL

ANIMAL NUMBER	BRAIN	HEART	THYROID	SPLEEN	ADRE'LS	LIVER	KIDNEYS	TESTES
8670	0.5135	0.3877	0.0089	0.1781	0.0132	3.1906	0.7981	0.8397
8671	0.4767	0.3785	0.0049	0.1908	0.0130	3.1910	0.8841	0.8146
8672	0.3589	0.3847	0.0072	0.1648	0.0196	3.2433	0.9347	0.9876
8673	0.4167	0.3527	0.0089	0.1537	0.0123	3.2803	0.7799	0.6940
8674	0.4065	0.3968	0.0071	0.1439	0.0109	3.1719	0.8397	0.7075
8675	0.5028	0.4104	0.0064	0.2108	0.0172	3.6981	1.0080	0.8726
8676	0.4593	0.3475	0.0061	0.2068	0.0112	3.7895	0.8904	0.6449
8677	0.5208	0.4139	0.0067	0.1671	0.0188	3.4205	0.9359	0.9309
8678	0.4315	0.3479	0.0043	0.1639	0.0097	3.8067	0.8117	0.8114
8679	0.5336	0.3389	0.0074	0.1575	0.0149	2.9968	0.8193	0.8595
8680	0.5086	0.3732	0.0089	0.1737	0.0128	3.5734	0.9089	0.7949
8681	0.4595	0.3604	0.0041	0.1595	0.0104	3.4423	0.7613	0.7777
8682	0.4791	0.3117	0.0055	0.1806	0.0119	3.9526	0.8174	0.7753
8683	0.4730	0.3359	0.0065	0.1310	0.0161	3.6951	0.8614	0.6951
8684	0.5127	0.4249	0.0042	0.1639	0.0107	3.4266	0.8154	1.5067
8685	0.5304	0.3454	0.0070	0.1575	0.0188	4.2570	0.9389	0.8771
8686	0.5182	0.3646	0.0098	0.1606	0.0172	3.0566	0.8685	0.8033
8687	0.5098	0.3730	0.0047	0.1541	0.0154	3.8056	0.9331	0.9448
8688	0.4384	0.3338	0.0050	0.1477	0.0272	3.7761	0.9334	0.6958
8689	0.6014	0.4133	0.0073	0.2024	0.0149	4.0848	0.9473	0.9258
N	20	20	20	20	20	20	20	20
MEAN	0.4925	0.3697	0.0064	0.1684	0.0148	3.5410	0.8769	0.8479
S.D.	0.0488	0.0313	0.0019	0.0211	0.0042	0.3550	0.0709	0.1815
S.E.	0.0109	0.0070	0.0004	0.0047	0.0009	0.0794	0.0159	0.0406

TABLE H-20 (CONTINUED)
PROJECT NO. 1073415
ORGAN WEIGHT-BODY WEIGHT PERCENTAGES IN FEMALE RATS
DOSE - CONTROL
GROUP - 1
TERMINAL KILL

ANIMAL NUMBER	BRAIN	HEART	THYROID	SPLEEN	ADRE'LS	LIVER	KIDNEYS	OVARIES
8695	0.7482	0.3747	0.0084	0.2522	0.0341	3.5960	0.8799	0.0566
8696 [b]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8697	0.7629	0.3647	0.0121	0.3456	0.0210	3.7320	0.8695	0.0449
8698	0.7087	0.3815	0.0087	0.2851	0.0244	3.0436	0.7691	0.0553
8699	0.7658	0.3744	0.0132	0.2789	0.0353	3.7515	0.8508	0.0496
8700	0.6199	0.3416	0.0057	0.2348	0.0250	3.7824	0.7801	0.0517
8701	0.8723	0.3926	0.0113	0.2623	0.0333	3.8528	0.9814	0.0506
8702	0.8246	0.4430	0.0075	0.1798	0.0311	5.8582	1.0298	0.0627
8703	0.7896	0.3830	0.0145	0.2087	0.0365	3.4436	0.8759	0.0274
8704	0.7432	0.3773	0.0110	0.1762	0.0238	3.1476	0.9084	0.0502
8705	0.7766	0.4159	0.0071	0.1845	0.0289	3.5916	0.9753	0.0444
8706	0.7859	0.3695	0.0064	0.2181	0.0398	3.0048	0.7823	0.0799
8707	0.8705	0.3756	0.0090	0.1453	0.0299	3.4645	0.8962	0.0526
8708	0.7617	0.3778	0.0194	0.2403	0.0214	4.2238	0.9254	0.0843
8709	0.8278	0.4588	0.0078	0.2139	0.0302	3.6404	0.8894	0.0698
8710	0.7027	0.4441	0.0078	0.1922	0.0332	3.9730	0.9160	0.0738
8711	0.9881	0.3571	0.0090	0.2705	0.0424	4.0210	0.8976	0.0624
8712	0.9000	0.4176	0.0102	0.2083	0.0343	3.9917	0.9319	0.0519
8713	0.8380	0.3966	0.0145	0.1872	0.0556	3.6103	0.9658	0.0581
8714	0.8114	0.4671	0.0076	0.2127	0.0308	3.9114	0.9722	0.0570
N	19	19	19	19	19	19	19	19
MEAN	0.7946	0.3944	0.0101	0.2261	0.0322	3.6642	0.8998	0.0570
S.D.	0.0613	0.0340	0.0034	0.0479	0.0082	0.3321	0.0709	0.0133
S.E.	0.0187	0.0078	0.0008	0.0110	0.0019	0.0762	0.0163	0.0031

[b] Body weight not taken.

TABLE H-20 (CONTINUED)
PROJECT NO. 1073415
ORGAN WEIGHT-BODY WEIGHT PERCENTAGES IN FEMALE RATS
DOSE = 300 PPM
GROUP = 2
TERMINAL KILL

ANIMAL NUMBER	BRAIN	HEART	THYROID	SPLEEN	ADRE'LS	LIVER	KIDNEYS	OVARIES
8715	0.7527	0.4156	0.0128	0.2070	0.0263	4.0992	0.9449	0.0486
8716	0.8193	0.4107	0.0152	0.2560	0.0317	5.6613	0.8514	0.0531
8717	0.8292	0.5100	0.0108	0.2265	0.0331	5.0246	0.9746	0.0527
8718	0.6841	0.3682	0.0088	0.2064	0.0233	5.8604	0.7590	0.0502
8719	0.8112	0.4598	0.0104	0.2349	0.0315	4.0772	1.0332	0.0589
8720	0.8162	0.3737	0.0100	0.2717	0.0346	4.1208	0.8846	0.0471
8721	0.7743	0.4862	0.0115	0.2368	0.0324	3.9435	0.7684	0.0549
8722	1.0236	0.5231	0.0351	0.3260	0.0327	4.0846	1.1067	0.0601
8723	0.7421	0.4162	0.0058	0.2444	0.0259	5.5046	1.0216	0.0347
8724	0.8936	0.4291	0.0141	0.2100	0.0500	5.5032	0.9200	0.0605
8725	0.8025	0.4498	0.0058	0.2199	0.0295	5.5988	0.8896	0.0560
8726	0.6781	0.4128	0.0101	0.2323	0.0313	4.3842	1.1949	0.0374
8727	0.8489	0.3870	0.0054	0.1874	0.0395	5.4031	0.9700	0.0368
8728	0.6921	0.3643	0.0134	0.2617	0.0130	5.6310	0.8462	0.0469
8729	0.7195	0.3707	0.0094	0.1989	0.7789[a]	5.2274	0.8816	0.0391
8730	0.6925	0.3711	0.0082	0.2285	0.0292	5.6711	0.9472	0.0420
8731	0.8702	0.4188	0.0197	0.2158	0.0330	5.8693	1.1156	0.0422
8732	0.7434	0.4588	0.0064	0.2238	0.0342	5.8093	0.9420	0.0708
8733	0.8000	0.4241	0.0057	0.2024	0.0433	5.8690	0.8624	0.0759
8734	0.7323	0.3887	0.0162	0.2462	0.0376	5.7008	0.9417	0.0259
N	20	20	20	20	19	20	20	20
MEAN	0.7865	0.4209	0.0117	0.2317	0.0322	5.7522	0.9428	0.0497
S.D.	0.0846	0.0465	0.0067	0.0313	0.0077	0.3290	0.1113	0.0123
S.E.	0.0189	0.0104	0.0015	0.0070	0.0017	0.0736	0.0249	0.0028

[a]Weight judged erroneous. Omitted from statistics.

TABLE H-20 (CONTINUED)
PROJECT NO. 1073415
ORGAN WEIGHT-BODY WEIGHT PERCENTAGES IN FEMALE RATS
DOSE - 1000 PPM
GROUP - 3
TERMINAL KILL

ANIMAL NUMBER	BRAIN	HEART	THYROID	SPLEEN	ADRE'LS	LIVER	KIDNEYS	OVARIES
8735	0.8514	0.4296	0.0074	0.2333	0.0235	3.9745	0.9494	0.0605
8736	0.7892	0.3804	0.0180	0.2192	0.0244	4.2724	0.8860	0.0472
8737	0.7263	0.3616	0.0128	0.2577	0.0335	3.1491	0.8694	0.0548
8738	0.6510	0.3240	0.0072	0.1969	0.0394	3.7538	0.8353	0.0634
8739	0.9357	0.4376	0.0062	0.3214	0.0300	3.4995	0.9505	0.0652
8740	0.9043	0.4550	0.0108	0.3394	0.0316	2.8771	0.9545	0.0615
8741	0.8591	0.4401	0.0055	0.2700	0.0278	4.4413	0.9705	0.0641
8742	0.8215	0.4522	0.0036	0.2410	0.0363	4.5785	1.0980	0.0785
8743	0.6808	0.4178	0.0118	0.0 [C]	0.0353	3.7330	0.9175	0.0576
8744	0.8445	0.4122	0.0102	0.2816	0.0249	3.6163	0.8792	0.0518
8745	0.9507	0.4524	0.0064	0.1772	0.0356	3.7726	1.0763	0.0694
8746	0.7095	0.4449	0.0051	0.1821	0.0314	3.7591	0.9931	0.0529
8747	.8714	0.4889	0.0115	0.2068	0.0256	3.9239	1.1158	0.0650
8748	0.7667	0.3937	0.0100	0.2507	0.0353	4.0059	1.0044	0.0789
8749	0.8188	0.4085	0.0115	0.2235	0.0380	3.9017	0.9872	0.0568
8750	0.7696	0.3525	0.0070	0.2556	0.0331	3.9039	0.9696	0.0451
8751	0.6949	0.4792	0.0153	0.2236	0.0398	3.4537	0.8912	0.0574
8752	0.7286	0.4214	0.0071	0.1898	0.0297	3.8203	0.8989	0.0598
8753	0.6792	0.3719	0.0125	0.1990	0.0191	3.7569	0.9625	0.0312
8754	0.8157	0.4021	0.0120	0.2083	0.0438	3.8459	1.0872	0.0682
N	20	20	20	19	20	20	20	20
MEAN	0.7934	0.4153	0.0096	0.2356	0.0317	3.8020	0.9648	0.0595
S.D.	0.0884	0.0423	0.0037	0.0447	0.0063	0.3895	0.0804	0.0110
S.E.	0.0198	0.0094	0.0008	0.0103	0.0014	0.0871	0.0180	0.0025

[C]Organ lost; weight not taken.

TABLE H-20 (CONTINUED)
PROJECT NO. 1073415
ORGAN WEIGHT-BODY WEIGHT PERCENTAGES IN FEMALE RATS
DOSE = 3000 PPM
GROUP = 4
TERMINAL KILL

ANIMAL NUMBER	BRAIN	HEART	THYROID	SPLEEN	ADRE'LS	LIVER	KIDNEYS	OVARIES
8755	0.9089	0.4517	0.0094	0.2246	0.0276	5.8138	0.9261	0.0670[a]
8756	0.7301	0.4371	0.0125	0.2511	0.0301	5.5794	1.0184	0.0500
8757	0.7973	0.5969	0.0062	0.1988	0.0389	5.5004	0.9082	0.0393
8758	0.8917	0.4037	0.0074	0.2917	0.0259	5.5102	0.8815	0.0667
8759	0.8882	0.4603	0.0083	0.2489	0.0472	5.6568	1.0017	0.0633
8760	0.8028	0.5857	0.0071	0.2988	0.0226	5.5929	0.9040	0.0254
8761	0.7818	0.4573	0.0170	0.2644	0.0289	5.1372	0.9814	0.0534
8762	0.8180	0.5069	0.0049	0.2359	0.0290	5.5155	0.8882	0.0620
8763	0.8000	0.4382	0.0067[a]	0.1857	0.0273	5.4668	0.9903	0.0546
8764	0.7446	0.5928	0.0072	0.2175	0.0291	5.6203	0.9171	0.0645
8765	0.9412	0.4161	0.0075	0.2467	0.0457	5.6950	1.0513	0.0543
8766	0.7542	0.4084	0.0111	0.2504	0.0347	5.5134	0.9672	0.0408
8767	0.8848	0.5559	0.0095	0.2028	0.0356	5.9697	0.9777	0.0526
8768	0.9368	0.4813	0.0100	0.2273	0.0402[a]	5.6153	1.0483	0.0651[a]
8769	0.8991	0.4291	0.0035	0.2113	0.0526	5.4178	1.0096	0.0235
8770	0.7949	0.4455	0.0047	0.1804	0.0376	5.9365	0.8945	0.0455
8771	0.8173	0.5671	0.0141	0.2498	0.0430	5.2486	0.9293	0.0643
8772	0.8682[a]	0.4784	0.0081	0.2801	0.0284	5.5703	0.9619	0.0699
8773	0.8815	0.4768	0.0100	0.2246	0.0469	2.8512	1.0019	0.0573
8774	0.7000	0.5547	0.0119	0.1618	0.0523	5.6537	0.9642	0.0372
N	19	20	19	20	19	20	20	18
MEAN	0.8302	0.4972	0.0090	0.2326	0.0338	5.5222	0.9611	0.0514
S.D.	0.0723	0.0437	0.0034	0.0365	0.0075	0.2613	0.0526	0.0137
S.E.	0.0166	0.0098	0.0008	0.0082	0.0017	0.0584	0.0118	0.0032

[a]Organ weight taken after fixation; deleted from statistical calculation.

SECTION H

APPENDIX B

SPONSOR: U.S. Army R&D

MATERIAL: Isopropyl Methylphosphonic acid, sodium salt

SUBJECT: FINAL PATHOLOGY REPORT
3-Month Oral Toxicity Study in Rats
LBI Project No. 10734-15

METHODOLOGY

Pathological examinations were conducted on 20 male and 20 female CRL:COBS CS(SD)BR rats which were exposed (or not exposed) to IMPA in the feed for approximately 13 weeks at each of the following dose levels: Group 1, 0 ppm (control); Group 2, 300 ppm; Group 3, 1000 ppm; and Group 4, 3000 ppm. All animals survived and at the end of the exposure period, each animal was killed by CO2 intoxication and subjected to a detailed necropsy examination. The most recent clinical observations for each animal were reviewed at necropsy, and all observations of gross abnormalities were recorded directly onto the necropsy sheet as encountered. Liver, heart, spleen, kidneys, adrenals, gonads, and brain were weighed from all animals immediately after sacrifice. Following gross examination appropriate samples of the following tissues were fixed in 10% neutral buffered formalin: Any unusual lesions, brain (cerebrum, cerebellum, brainstem), spinal cord (thoracic, cervical), eye (left), pituitary, salivary gland (submandibular), heart, thymus, thyroid, lungs (with mainstem bronchi), trachea, spleen, bone (with marrow) sternum, mesenteric lymph node, esophagus, stomach, small intestine (duodenum, ileum, jejunum), large intestine (colon, cecum), adrenal glands, pancreas, liver (2 sections), kidneys, ovaries/testes, prostate, uteri (corpus, cervix), skin (mammary area), skeletal muscle (rectus femoris), sciatic nerve, and urinary bladder. These tissues from all Group 1 and 4 animals were embedded in paraffin, sectioned at five to seven microns, stained with hematoxylin and examined microscopically.[1]

GROSS FINDINGS

There were few gross lesions observed. Those that were present were not unusual for rats of this age and strain and had no particular relevance to the study. In general, the rats appeared to be quite free from disease.

HISTOPATHOLOGY

The results of microscopic examination of the tissues are presented in The Tables of Microscopic Findings. Ocassional tissues were lost in processing and not available for microscopic examination; thus, the number of any one tissue examined does not necessarily correspond with the number of animals necropsied. No neoplasms were observed in the examined animals. A variety of inflammatory and degenerative changes occurred randomly in both treated and/or control rats. Most common of these lesions was lymphocytic inflammatory infiltration around pulmonary vessels. The occurred usually as mild or

moderate cuffing, the cause of which was not determined but probably is of viral origin. A second lesion of unknown etiology but commonly observed in rats, particularly males, was myocardial degeneration or myocardiopathy. Finally, renal mineralization was noted, usually as a focal change in the medulla or pelvis of kidneys, while hydronephrosis was present in some of these animals most likely the cause of pelvic urolithiasis.

CONCLUSIONS

No changes or lesions associated with treatment were noted in examined animals. Lesions which were present occurred randomly in both treated and control animals and are of the kinds commonly seen in rats of this age and strain.

SUBMITTED BY:

Richard H. Cardy, D.V.M.
Director, Department of Pathology

11 May 81
Date

[1] Necropsies were conducted under the direct supervision of this pathologist. Initial histopathologic examinations were done by Dr. Alexander DePaoli. Histologic review of all slides from 25% of the animals (selected randomly) and review of selected lesions was conducted by me. My interpretation of histologic material from these animals was not different from Dr. Depaoli's. This report was prepared by me from data obtained during the gross and histopathologic examinations.

LITTON BIONETICS, INC.
PROJECT NO. 10734-15

LEGEND

Animal disposition codes

E = escaped
F = found dead
I = interim kill
K = killed accidentally
M = moribund kill
T = terminal kill

Tissue status codes

+ = tissue examined, lesions found
X = tissue examined, no lesion found
I = insufficient tissue present for evaluation
A = autolysis too severe for microscopic evaluation
C = cannibalized
S = section and/or tissue not present
P = paired organs, one missing
N = tissue not examined
E = excluded by protocol

Lesion grades (non-tumor pathology)

* = not graded
1 = minimal
2 = mild
3 = moderate
4 = marked
5 = severe

Tumor counts (tumor pathology)

1 = one occurrence
2 = two occurrences
3 = three occurrences
4 = four occurrences
5 = five occurrences

LITTON BIONETICS, INC.
PROJECT NO. 10734-15

ANIMAL-STATUS SUMMARY REPORT

MALES AND FEMALES

SPECIES: RATS
SOURCE: CHARLES RIVER (PORTAGE)
STRAIN: CDBS CD(SD) BR

	GROUP 1 UNTREATED CONTROL		GROUP 2 LOW DOSE		GROUP 3 MEDIUM DOSE		GROUP 4 HIGH DOSE	
	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE
NUMBER OF ANIMALS INITIALLY ON STUDY	20	20	20	20	20	20	20	20
NUMBER OF ANIMALS INCLUDED IN THIS REPORT	20	20	20	20	20	20	20	20
NUMBER OF ANIMALS MISSING	0	0	0	0	0	0	0	0
NUMBER OF SCHEDULED AND UNSCHEDULED DEATHS	20	20	20	20	20	20	20	20
MEAN SURVIVAL TIME IN DAYS	91	91	91	91	91	91	91	91
NUMBER OF SCHEDULED DEATHS	20	20	20	20	20	20	20	20
MEAN SURVIVAL TIME IN DAYS	91	91	91	91	91	91	91	91
NUMBER OF UNSCHEDULED DEATHS	0	0	0	0	0	0	0	0
MEAN SURVIVAL TIME IN DAYS	-	-	-	-	-	-	-	-
NUMBER OF ANIMALS NECROPSIED	20	20	20	20	20	20	20	20
NUMBER OF ANIMALS EXAMINED HISTOLOGICALLY	20	20	0	0	0	0	20	20

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LITTON BIONETICS INC.
PROJECT NO. 10734-15

TUMOR SUMMARY TABLE

MALES, FEMALES AND COMBINED
COMBINED SCHEDULED AND UNSCHEDULED DEATHS

SPECIES: RATS
STRAIN: CDBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)

	GROUP 1			GROUP 2			GROUP 3			GROUP 4		
	UNTREATED CONTROL			LOW DOSE			MEDIUM DOSE			HIGH DOSE		
	F	M	C	F	M	C	F	M	C	F	M	C
NUMBER OF ANIMALS EXAMINED HISTOLOGICALLY:	20	20	40	0	0	0	0	0	0	20	20	40
NUMBER OF ANIMALS WITH TUMORS:	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL NUMBER OF TUMORS:	0	0	0	0	0	0	0	0	0	0	0	0
I. BENIGN TUMORS:												
A. NUMBER OF ANIMALS WITH BENIGN TUMORS	0	0	0	0	0	0	0	0	0	0	0	0
B. TOTAL NUMBER OF BENIGN TUMORS	0	0	0	0	0	0	0	0	0	0	0	0
II. UNCERTAIN BENIGN OR MALIGNANT TUMORS:												
A. NUMBER OF ANIMALS WITH TUMORS, UNCERTAIN BENIGN OR MALIGNANT	0	0	0	0	0	0	0	0	0	0	1	1
B. TOTAL NUMBER OF TUMORS, UNCERTAIN BENIGN OR MALIGNANT	0	0	0	0	0	0	0	0	0	0	1	1
III. MALIGNANT TUMORS OR MALIGNANT TUMOR COMPLEXES:												
A. NUMBER OF ANIMALS WITH MALIGNANT TUMORS OR MALIGNANT TUMOR COMPLEXES	0	0	0	0	0	0	0	0	0	0	0	1
1. NUMBER OF ANIMALS WITH PRIMARY MALIGNANT TUMORS WITHOUT SECONDARY COMPLEXES	0	0	0	0	0	0	0	0	0	0	0	0
2. NUMBER OF ANIMALS WITH MALIGNANT TUMORS, UNCERTAIN PRIMARY OR SECONDARY	0	0	0	0	0	0	0	0	0	0	1	0
3. NUMBER OF ANIMALS WITH MALIGNANT TUMOR COMPLEXES SPREAD BY METASTASIS	0	0	0	0	0	0	0	0	1	0	0	0
4. NUMBER OF ANIMALS WITH MALIGNANT TUMOR COMPLEXES SPREAD BY EXTENSION OR SEEDING	0	0	0	0	0	0	0	0	0	0	0	0
B. TOTAL NUMBER OF MALIGNANT TUMORS OR MALIGNANT TUMOR COMPLEXES	0	0	0	0	0	0	0	0	0	0	1	0
1. TOTAL NUMBER OF PRIMARY MALIGNANT TUMORS WITHOUT SECONDARY COMPLEXES	0	0	0	0	0	0	0	0	0	0	0	1
2. TOTAL NUMBER OF MALIGNANT TUMORS, UNCERTAIN PRIMARY OR SECONDARY	0	0	0	0	0	0	0	0	0	0	0	0
3. TOTAL NUMBER OF MALIGNANT TUMOR COMPLEXES SPREAD BY METASTASIS	0	0	0	0	0	0	0	0	0	0	1	1
4. TOTAL NUMBER OF MALIGNANT TUMOR COMPLEXES SPREAD BY EXTENSION OR SEEDING	0	0	0	0	0	0	0	0	0	0	0	0

B10518-050115.00 (01)4-01

LITTON BIONETICS, INC.
PROJECT NO. 10734-15

SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)

DOSE RELATED INCIDENCE

NON-TUMOR PATHOLOGY ONLY
SCHEDULED AND UNSCHEDULED DEATHS COMBINED
FEMALES AND MALES

	GROUP 1		GROUP 2		GROUP 3		GROUP 4	
	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE
NUMBER OF ANIMALS EXAMINED HISTOLOGICALLY	20	20	0	0	0	0	20	20
CIRCULATORY SYSTEM								
HEART	(20)	(20)	(0)	(0)	(0)	(0)	(20)	(20)
DEGENERATION, NOS	1	3	0	0	0	0	1	5
DIGESTIVE SYSTEM								
LIVER	(20)	(20)	(0)	(0)	(0)	(0)	(20)	(20)
INFLAMMATION, FOCAL	0	0	0	0	0	0	1	0
INFLAMMATION, MULTIFOCAL	1	0	0	0	0	0	0	1
METAMORPHOSIS, FATTY	1	0	0	0	0	0	0	0
HEMATOPOIESIS (EXTRAMEDULLARY)	1	0	0	0	0	0	0	0
LIVER/CENTRILOBULAR								
BASOPHILIC STIPPLING	0	0	0	0	0	0	1	5
MULTIFOCAL								
LYMPHOCYTIC INFLAMMATORY INFILTRATE	1	0	0	0	0	0	0	0
PANCREAS	(20)	(20)	(0)	(0)	(0)	(0)	(20)	(20)
INFLAMMATION, FOCAL	0	1	0	0	0	0	0	1
PANCREATIC ACINUS								
ATROPHY, NOS	0	1	0	0	0	0	0	0
STOMACH	(20)	(20)	(0)	(0)	(0)	(0)	(20)	(20)
INFLAMMATION, NOS	18	16	0	0	0	0	19	15
ILEUM	(20)	(20)	(0)	(0)	(0)	(0)	(20)	(20)
HYPERPLASIA, LYMPHOID	1	0	0	0	0	0	0	0
CECUM	(20)	(20)	(0)	(0)	(0)	(0)	(20)	(20)
INFLAMMATION, NOS	0	1	0	0	0	0	1	4
ENDOCRINE SYSTEM								
PITUITARY	(20)	(20)	(0)	(0)	(0)	(0)	(20)	(19)
CYST, NOS	0	0	0	0	0	0	2	0

B10508-050115.00 (01)4-02

LITTON BIONETICS, INC.
PROJECT NO. 10734-15

SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)

DOSE RELATED INCIDENCE

NON-TUMOR PATHOLOGY ONLY
SCHEDULED AND UNSCHEDULED DEATHS COMBINED
FEMALES AND MALES

	GROUP 1		GROUP 2		GROUP 3		GROUP 4	
	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE
NUMBER OF ANIMALS EXAMINED HISTOLOGICALLY	20	20	0	0	0	0	20	20
HEMATOPOIETIC SYSTEM								
SPLEEN	(20)	(20)	(0)	(0)	(0)	(0)	(20)	(20)
HEMOSIDEROSIS	9	0	0	0	0	0	5	0
HEMATOPOIESIS (EXTRAMEDULLARY)	6	5	0	0	0	0	8	9
MESENTERIC LYMPH NODE	(20)	(20)	(0)	(0)	(0)	(0)	(20)	(20)
INFLAMMATION, GRANULOMATOUS	0	0	0	0	0	0	1	0
PLASMACYTOSIS	1	0	0	0	0	0	0	0
INTEGUMENTARY SYSTEM								
SKIN	(0)	(1)	(0)	(0)	(0)	(0)	(0)	(0)
INFLAMMATION, NOS	0	1	0	0	0	0	0	0
MUSCULOSKELETAL SYSTEM								
RECTUS FEMORIS MUSCLE	(20)	(20)	(0)	(0)	(0)	(0)	(20)	(20)
DEGENERATION, NOS	1	0	0	0	0	0	0	0
MULTIFOCAL								
DEGENERATION, NOS	0	0	0	0	0	0	1	0
RESPIRATORY SYSTEM								
LUNGS	(20)	(20)	(0)	(0)	(0)	(0)	(20)	(20)
INFLAMMATION, NOS	0	0	0	0	0	0	0	1
INFLAMMATION, FOCAL	0	0	0	0	0	0	0	1
PNEUMONIA, CHRONIC MURINE	1	0	0	0	0	0	0	0
INFLAMMATION, CHRONIC FOCAL	1	0	0	0	0	0	0	0
HISTIOCYTOSIS	3	3	0	0	0	0	0	2
BLOOD VESSEL								
MINERALIZATION	0	2	0	0	0	0	0	0
LYMPHOCYTIC INFLAMMATORY INFILTRATE	8	12	0	0	0	0	15	12
BLOOD VESSEL								
FOCAL								
MINERALIZATION	0	0	0	0	0	0	1	1

810508-050115.00 (8114-03)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15

DOSE RELATED INCIDENCE

SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)

NON-TUMOR PATHOLOGY ONLY
SCHEDULED AND UNSCHEDULED DEATHS COMBINED
FEMALES AND MALES

	GROUP 1		GROUP 2		GROUP 3		GROUP 4	
	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE
NUMBER OF ANIMALS EXAMINED HISTOLOGICALLY	20	20	0	0	0	0	20	20
RESPIRATORY SYSTEM								
LUNGS	(20)	(20)	(0)	(0)	(0)	(0)	(20)	(20)
FOCAL								
HISTIOCYTOSIS	2	0	0	0	0	0	0	1
SPECIAL SENSES SYSTEM								
LEFT EYE	(19)	(19)	(0)	(0)	(0)	(0)	(20)	(20)
INFLAMMATION, ACUTE	0	0	0	0	0	0	0	1
EYE/CORNEA								
INFLAMMATION, ACUTE	0	0	0	0	0	0	0	1
PERIORBITAL REGION								
INFLAMMATION, NOS	0	0	0	0	0	0	1	1
URINARY SYSTEM								
KIDNEYS	(20)	(20)	(0)	(0)	(0)	(0)	(20)	(20)
HYDRONEPHROSIS	2	4	0	0	0	0	1	2
INFLAMMATION, FOCAL	1	1	0	0	0	0	0	1
INFLAMMATION, CHRONIC FOCAL	1	0	0	0	0	0	0	0
NEPHROPATHY	1	0	0	0	0	0	0	0
BLOOD VESSEL								
LYMPHOCYTIC INFLAMMATORY INFILTRATE	0	0	0	0	0	0	1	0
INTERSTITIAL TISSUE OF KIDNEY								
MULTIFOCAL								
INFLAMMATION, INTERSTITIAL	0	1	0	0	0	0	0	1
KIDNEY/CORTEX								
CYST, NOS	1	1	0	0	0	0	0	1
KIDNEY/PELVIS								
CALCULUS, NOS	1	0	0	0	0	0	0	0
MINERALIZATION	0	0	0	0	0	0	2	1
INFLAMMATION, NOS	0	0	0	0	0	0	1	0
INFLAMMATION, ACUTE	0	0	0	0	0	0	1	0
INFLAMMATION, CHRONIC	1	0	0	0	0	0	0	0
FOCAL								
MINERALIZATION	1	0	0	0	0	0	0	1
INFLAMMATION, INTERSTITIAL	0	0	0	0	0	0	1	1

LITTON BIONETICS, INC.
PROJECT NO. 10734-15

SPECIES: RATS
STRAIN: CORS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)

DOSE RELATED INCIDENCE

NON-TUMOR PATHOLOGY ONLY
SCHEDULED AND UNSCHEDULED DEATHS COMBINED
FEMALES AND MALES

	GROUP 1		GROUP 2		GROUP 3		GROUP 4	
	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE
NUMBER OF ANIMALS EXAMINED HISTOLOGICALLY	20	20	0	0	0	0	20	20
REPRODUCTIVE SYSTEM (FEMALE ONLY)								
CORPUS UTERI	(20)	(0)	(0)	(0)	(0)	(0)	(20)	(0)
DILATATION, NOS	0	0	0	0	0	0	1	0
REPRODUCTIVE SYSTEM (MALE ONLY)								
TESTES	(0)	(20)	(0)	(0)	(0)	(0)	(0)	(20)
FOCAL								
MINERALIZATION	0	1	0	0	0	0	0	0
PROSTATE	(0)	(20)	(0)	(0)	(0)	(0)	(0)	(20)
INFLAMMATION, NOS	0	1	0	0	0	0	0	2

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LITTON BIONETICS, INC.
PROJECT NO. 10739-15

SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)

DOSE RELATED INCIDENCE FOR SCHEDULED, UNSCHEDULED AND COMBINED DEATHS

NON-TUMOR PATHOLOGY ONLY
SCHEDULED, UNSCHEDULED AND COMBINED DEATHS
FEMALES AND MALES COMBINED

	GROUP 1			GROUP 2			GROUP 3			GROUP 4		
	SCH	UNS	COMBINED	SCH	UNS	COMBINED	SCH	UNS	COMBINED	SCH	UNS	COMBINED
NUMBER OF ANIMALS EXAMINED HISTOLOGICALLY	40	0	40	0	0	0	0	0	0	40	0	40
CIRCULATORY SYSTEM												
HEART	(40)(	0)(	40)	(0)(	0)(	0)	(0)(	0)(	0)	(40)(	0)(	40)
DEGENERATION, NOS	4	0	4	0	0	0	0	0	0	6	0	6
DIGESTIVE SYSTEM												
LIVER	(40)(	0)(	40)	(0)(	0)(	0)	(0)(	0)(	0)	(40)(	0)(	40)
INFLAMMATION, FOCAL	0	0	0	0	0	0	0	0	0	1	0	1
INFLAMMATION, MULTIFOCAL	2	0	2	0	0	0	0	0	0	0	0	0
METAMORPHOSIS, FATTY	1	0	1	0	0	0	0	0	0	0	0	0
HEMATOPOIESIS (EXTRAMEDULLARY)	1	0	1	0	0	0	0	0	0	0	0	0
LIVER/CENTRILOBULAR												
BASOPHILIC STIPPLING	0	0	0	0	0	0	0	0	0	1	0	1
MULTIFOCAL												
LYMPHOCYTIC INFLAMMATORY INFILTRATE	1	0	1	0	0	0	0	0	0	0	0	0
PANCREAS	(40)(	0)(	40)	(0)(	0)(	0)	(0)(	0)(	0)	(40)(	0)(	40)
INFLAMMATION, FOCAL	3	0	3	0	0	0	0	0	0	1	0	1
PANCREATIC ACINUS												
ATROPHY, NOS	1	0	1	0	0	0	0	0	0	0	0	0
STOMACH	(40)(	0)(	40)	(0)(	0)(	0)	(0)(	0)(	0)	(40)(	0)(	40)
INFLAMMATION, NOS	34	0	34	0	0	0	0	0	0	34	0	34
ILEUM	(40)(	0)(	40)	(0)(	0)(	0)	(0)(	0)(	0)	(40)(	0)(	40)
HYPERPLASIA, LYMPHOID	1	0	1	0	0	0	0	0	0	0	0	0
CECUM	(40)(	0)(	40)	(0)(	0)(	0)	(0)(	0)(	0)	(40)(	0)(	40)
INFLAMMATION, NOS	1	0	1	0	0	0	0	0	0	5	0	5
ENDOCRINE SYSTEM												
PITUITARY	(40)(	0)(	40)	(0)(	0)(	0)	(0)(	0)(	0)	(39)(	0)(	39)
CYST, NOS	0	0	0	0	0	0	0	0	0	2	0	2

810508-050115.00 (01)6-02

LITTON BIONETICS, INC.
PROJECT NO. 10734-15

SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)

DOSE RELATED INCIDENCE FOR SCHEDULED, UNSCHEDULED AND COMBINED DEATHS

NON-TUMOR PATHOLOGY ONLY
SCHEDULED, UNSCHEDULED AND COMBINED DEATHS
FEMALES AND MALES COMBINED

	GROUP 1			GROUP 2			GROUP 3			GROUP 4		
	SCH	UNS	COMBINED	SCH	UNS	COMBINED	SCH	UNS	COMBINED	SCH	UNS	COMBINED
NUMBER OF ANIMALS EXAMINED HISTOLOGICALLY	40	0	40	0	0	0	0	0	0	40	0	40
HEMATOPOIETIC SYSTEM												
SPLEEN	(40)(	0)(	40)	(0)(	0)(	0)	(0)(	0)(	0)	(40)(	0)(	40)
HEMOSIDEROSIS	9	0	9	0	0	0	0	0	0	5	0	5
HEMATOPOIESIS (EXTRAMEDULLARY)	11	0	11	0	0	0	0	0	0	17	0	17
MESENTERIC LYMPH NODE	(40)(	0)(	40)	(0)(	0)(	0)	(0)(	0)(	0)	(40)(	0)(	40)
INFLAMMATION, GRANULOMATOUS	0	0	0	0	0	0	0	0	0	1	0	1
PLASMACYTOSIS	1	0	1	0	0	0	0	0	0	0	0	0
INTEGUMENTARY SYSTEM												
SKIN	(1)(	0)(	1)	(0)(	0)(	0)	(0)(	0)(	0)	(0)(	0)(	0)
INFLAMMATION, NOS	1	0	1	0	0	0	0	0	0	0	0	0
MUSCULOSKELETAL SYSTEM												
RECTUS FEMORIS MUSCLE	(40)(	0)(	40)	(0)(	0)(	0)	(0)(	0)(	0)	(40)(	0)(	40)
DEGENERATION, NOS	1	0	1	0	0	0	0	0	0	0	0	0
MULTIFOCAL												
DEGENERATION, NOS	0	0	0	0	0	0	0	0	0	1	0	1
RESPIRATORY SYSTEM												
LUNGS	(40)(	0)(	40)	(0)(	0)(	0)	(0)(	0)(	0)	(40)(	0)(	40)
INFLAMMATION, NOS	0	0	0	0	0	0	0	0	0	1	0	1
INFLAMMATION, FOCAL	0	0	0	0	0	0	0	0	0	1	0	1
PNEUMONIA, CHRONIC MURINE	1	0	1	0	0	0	0	0	0	0	0	0
INFLAMMATION, CHRONIC FOCAL	1	0	1	0	0	0	0	0	0	0	0	0
HISTIOCYTOSIS	6	0	6	0	0	0	0	0	0	2	0	2
BLOOD VESSEL												
MINERALIZATION	2	0	2	0	0	0	0	0	0	5	0	5
LYMPHOCYTIC INFLAMMATORY INFILTRATE	20	0	20	0	0	0	0	0	0	27	0	27
BLOOD VESSEL												
FOCAL												
MINERALIZATION	0	0	0	0	0	0	0	0	0	1	0	1

B10508-050115.00 (0116-01

LITTON BIONETICS, INC.
PROJECT NO. 10734-15

SPECIES: RATS
STRAIN: CDB3 CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)

DOSE RELATED INCIDENCE FOR SCHEDULED, UNSCHEDULED AND COMBINED DEATHS

NON-TUMOR PATHOLOGY ONLY
SCHEDULED, UNSCHEDULED AND COMBINED DEATHS
FEMALES AND MALES COMBINED

	GROUP 1			GROUP 2			GROUP 3			GROUP 4		
	SCH	UNS	COMBINED	SCH	UNS	COMBINED	SCH	UNS	COMBINED	SCH	UNS	COMBINED
NUMBER OF ANIMALS EXAMINED HISTOLOGICALLY	40	0	40	0	0	0	0	0	0	40	0	40
RESPIRATORY SYSTEM												
LUNGS	(40)(	0)(	40)	(0)(	0)(	0)	(0)(	0)(	0)	(40)(	0)(	40)
FOCAL												
HISTIOCYTOSIS	2	0	2	0	0	0	0	0	0	0	0	0
SPECIAL SENSES SYSTEM												
LEFT EYE	(38)(	0)(	38)	(0)(	0)(	0)	(0)(	0)(	0)	(40)(	0)(	40)
INFLAMMATION, ACUTE	0	0	0	0	0	0	0	0	0	1	0	1
EYE/CORNEA												
INFLAMMATION, ACUTE	0	0	0	0	0	0	0	0	0	1	0	1
PERIORBITAL REGION												
INFLAMMATION, NOS	0	0	0	0	0	0	0	0	0	1	0	1
URINARY SYSTEM												
KIDNEYS	(40)(	0)(	40)	(0)(	0)(	0)	(0)(	0)(	0)	(40)(	0)(	40)
HYDRONEPHROSIS	6	0	6	0	0	0	0	0	0	3	0	3
INFLAMMATION, FOCAL	2	0	2	0	0	0	0	0	0	1	0	1
INFLAMMATION, CHRONIC FOCAL	1	0	1	0	0	0	0	0	0	0	0	0
NEPHROPATHY	1	0	1	0	0	0	0	0	0	0	0	0
BLOOD VESSEL												
LYMPHOCYTIC INFLAMMATORY INFILTRATE	0	0	0	0	0	0	0	0	0	1	0	1
INTERSTITIAL TISSUE OF KIDNEY												
MULTIFOCAL												
INFLAMMATION, INTERSTITIAL	1	0	1	0	0	0	0	0	0	0	0	0
KIDNEY/CORTEX												
CYST, NOS	2	0	2	0	0	0	0	0	0	1	0	1
KIDNEY/PELVIS												
CALCULUS, NOS	1	0	1	0	0	0	0	0	0	0	0	0
MINERALIZATION	0	0	0	0	0	0	0	0	0	3	0	3
INFLAMMATION, NOS	0	0	0	0	0	0	0	0	0	1	0	1
INFLAMMATION, ACUTE	0	0	0	0	0	0	0	0	0	1	0	1
INFLAMMATION, CHRONIC	1	0	1	0	0	0	0	0	0	0	0	0
FOCAL												
MINERALIZATION	1	0	1	0	0	0	0	0	0	1	0	1
INFLAMMATION, INTERSTITIAL	0	0	0	0	0	0	0	0	0	1	0	1

S10508-050115.00 (011a-04

LITTON BIONETICS, INC.
PROJECT NO. 10719-15

SPECIES: RATS
STRAIN: CD&S (SD) BR
SOURCE: CHARLES RIVER (PONTAGE)

DOSE RELATED INCIDENCE FOR SCHEDULED, UNSCHEDULED AND COMBINED DEATHS

NON-TUMOR PATHOLOGY ONLY
SCHEDULED, UNSCHEDULED AND COMBINED DEATHS
FEMALES AND MALES COMBINED

	GROUP 1			GROUP 2			GROUP 3			GROUP 4		
	SCH	UNS	COMBINED	SCH	UNS	COMBINED	SCH	UNS	COMBINED	SCH	UNS	COMBINED
NUMBER OF ANIMALS EXAMINED HISTOLOGICALLY	40	0	40	0	0	0	0	0	0	40	0	40
REPRODUCTIVE SYSTEM (FEMALE ONLY)												
CORPUS UTERI	(20)(	0)(	20)	(0)(	0)(	0)	(0)(	0)(	0)	(20)(	0)(	20)
DILATATION, NOS	0	0	0	0	0	0	0	0	0	1	0	1
REPRODUCTIVE SYSTEM (MALE ONLY)												
TESTES	(20)(	0)(	20)	(0)(	0)(	0)	(0)(	0)(	0)	(20)(	0)(	20)
FOCAL	1	0	1	0	0	0	0	0	0	0	0	0
MINERALIZATION												
PROSTATE	(20)(	0)(	20)	(0)(	0)(	0)	(0)(	0)(	0)	(20)(	0)(	20)
INFLAMMATION, NOS	1	0	1	0	0	0	0	0	0	2	0	2

B10508-055061.00 (0111-001

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 SUMMARY OF HISTOLOGIC FINDINGS FOR INDIVIDUAL ANIMALS

FEMALES
TUMOR AND NON-TUMOR PATHOLOGY
SCHEDULED AND UNSCHEDULED DEATHS

GROUP 1 - UNTREATED CONTROL SPECIES: RATS
DOSE AMOUNT: 0 PPM SOURCE: CHARLES RIVER (PORTAGE)
NUMBER OF ANIMALS: 20 STRAIN: CDBS CD(SD) BR

ANIMAL NUMBER	8 6 9 5	8 6 9 6	8 6 9 7	8 6 9 8	8 6 9 9	8 7 0 0	8 7 0 1	8 7 0 2	8 7 0 3	8 7 0 4	8 7 0 5	8 7 0 6	8 7 0 7	8 7 0 8	8 7 0 9	8 7 1 0	8 7 1 1	8 7 1 2	8 7 1 3	8 7 1 4
DAYS ON STUDY	0 0 9 2	0 0 9 2	0 0 9 2	0 0 9 2	0 0 9 2	0 0 9 2	0 0 9 1	0 0 9 1	0 0 9 1	0 0 9 1	0 0 9 1	0 0 9 1	0 0 9 1	0 0 9 0	0 0 9 0	0 0 9 0	0 0 9 0	0 0 9 0	0 0 9 0	0 0 9 0
DISPOSITION	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
CIRCULATORY SYSTEM																				
HEART	X	X	X	X	+	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
DEGENERATION, NOS				1																
DIGESTIVE SYSTEM																				
SUBMAXILLARY GLAND	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LIVER	X	X	+	X	X	+	X	X	X	X	X	+	X	X	X	X	X	X	X	X
INFLAMMATION, MULTIFOCAL			1																	
METAMORPHOSIS, FATTY					1															
HEMATOPOIESIS (EXTRAMEDULLARY) MULTIFOCAL			1																	
LYMPHOCYTIC INFLAMMATORY INFILTRATE											1									
PANCREAS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ESOPHAGUS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
STOMACH	+	+	+	+	+	+	+	+	X	+	X	+	+	+	+	+	+	+	+	+
INFLAMMATION, NOS	2	1	1	1	2	2	1	1	1		1		2	2	2	2	1	2	2	2
DUODENUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
JEJUNUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ILEUM	X	X	X	X	+	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
HYPERPLASIA, LYMPHOID					3															

LITTON BIONETICS, INC.
PROJECT NO. 10739-15 SUMMARY OF HISTOLOGIC FINDINGS FOR INDIVIDUAL ANIMALS

FEMALES
TUMOR AND NON-TUMOR PATHOLOGY
SCHEDULED AND UNSCHEDULED DEATHS

GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
NUMBER OF ANIMALS: 20

SPECIES: RATS
SOURCE: CHARLES RIVER (PORTAGE)
STRAIN: CDBS CD(SD) BR

ANIMAL NUMBER	8 6 9 5	8 6 9 6	8 6 9 7	8 6 9 8	8 6 9 9	8 7 0 0	8 7 0 1	8 7 0 2	8 7 0 3	8 7 0 4	8 7 0 5	8 7 0 6	8 7 0 7	8 7 0 8	8 7 0 9	8 7 1 0	8 7 1 1	8 7 1 2	8 7 1 3	8 7 1 4
DAYS ON STUDY	0 0 9 2	0 0 9 2	0 0 9 2	0 0 9 2	0 0 9 2	0 0 9 2	0 0 9 1	0 0 9 1	0 0 9 1	0 0 9 1	0 0 9 1	0 0 9 1	0 0 9 1	0 0 9 1	0 0 9 1	0 0 9 0	0 0 9 0	0 0 9 0	0 0 9 0	0 0 9 0
DISPOSITION	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
DIGESTIVE SYSTEM																				
COLON	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CECUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ENDOCRINE SYSTEM																				
PITUITARY	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ADRENAL GLANDS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
THYROID	X	X	X	X	X	X	X	X	X	X	S	X	X	X	X	X	X	X	X	X
HEMATOPOIETIC SYSTEM																				
BONE MARROW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SPLEEN	•	•	•	•	•	X	•	•	•	•	•	•	•	X	X	•	•	X	X	
HEMOSIDEROSIS							2	2	3	3	2	2	2			2	2			
HEMATOPOIESIS (EXTRAMEDULLARY)	3	3	3	3		?														
MESENTERIC LYMPH NODE	X	X	X	•	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PLASMACYTOSIS				3																
THYMUS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

LITTON BIONETICS, INC.
PROJECT NO. 10739-15

SUMMARY OF HISTOLOGIC FINDINGS FOR INDIVIDUAL ANIMALS

FEMALES
TUMOR AND NON-TUMOR PATHOLOGY
SCHEDULED AND UNSCHEDULED DEATHS

GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
NUMBER OF ANIMALS: 20

SPECIES: RATS
SOURCE: CHARLES RIVER (PORTAGE)
STRAIN: CDRS CD(SD) BR

ANIMAL NUMBER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6	6	6	6	6	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	9	9	9	9	9	0	0	0	0	0	0	0	0	0	1	1	1	1	1
	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4
DAYS ON STUDY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	1	1	1	1	1	1	0	0	0	0	0	0	0
DISPOSITION	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
INTEGUMENTARY SYSTEM																			
SKIN OF MAMMARY GLAND	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MUSCULOSKELETAL SYSTEM																			
STERNUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RECTUS FEMORIS MUSCLE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	+	X	X
DEGENERATION, NOS																	1		
NERVOUS SYSTEM																			
SCIATIC NERVE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CEREBRUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BRAIN STEM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CEREBELLUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CERVICAL SPINAL CORD	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
THORACIC SPINAL CORD	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

LITTON BIONETICS, INC.
PROJECT NO. 10734-15

SUMMARY OF HISTOLOGIC FINDINGS FOR INDIVIDUAL ANIMALS

FEMALES
TUMOR AND NON-TUMOR PATHOLOGY
SCHEDULED AND UNSCHEDULED DEATHS

GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
NUMBER OF ANIMALS: 20

SPECIES: RATS
SOURCE: CHARLES RIVER (PORTAGE)
STRAIN: CDBS CD(SD) BR

ANIMAL NUMBER	8 6 9 5	8 6 9 6	8 6 9 7	8 6 9 8	8 6 9 9	8 7 0 0	8 7 0 1	8 7 0 2	8 7 0 3	8 7 0 4	8 7 0 5	8 7 0 6	8 7 0 7	8 7 0 8	8 7 0 9	8 7 1 0	8 7 1 1	8 7 1 2	8 7 1 3	8 7 1 4
DAYS ON STUDY	0 0 9 2	0 0 9 2	0 0 9 2	0 0 9 2	0 0 9 2	0 0 9 2	0 0 9 1	0 0 9 1	0 0 9 1	0 0 9 1	0 0 9 1	0 0 9 1	0 0 9 0	0 0 9 0	0 0 9 0	0 0 9 0	0 0 9 0	0 0 9 0	0 0 9 0	0 0 9 0
DISPOSITION	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
RESPIRATORY SYSTEM																				
LUNGS	X	X	+	+	+	+	X	+	+	+	+	X	+	+	X	X	+	+	X	+
PNEUMONIA, CHRONIC MURINE				2																
INFLAMMATION, CHRONIC FOCAL					3															
HISTIOCYTOSIS							1	1		1										
BLOOD VESSEL																				
LYMPHOCYTIC INFLAMMATORY INFILTRATE							+		+	+		+	+			+	+		+	
FOCAL																				
HISTIOCYTOSIS		1			1															
TRACHEA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SPECIAL SENSES SYSTEM																				
LEFT EYE	X	X	X	X	X	X	X	X	X	X	S	X	X	X	X	X	X	X	X	X
URINARY SYSTEM																				
KIDNEYS	X	X	+	+	X	+	X	X	X	X	+	+	X	X	X	X	+	+	X	X
HYDRONEPHROSIS				+		+														
INFLAMMATION, FOCAL																		1		
INFLAMMATION, CHRONIC FOCAL			1																	
NEPHROPATHY										1										
KIDNEY/CORTEX																			•	
CYST, NOS																				
KIDNEY/PELVIS																				
CALCULUS, NOS				•																

(TISSUE CONTINUED)

LITTON BIONETICS, INC.
PROJECT NO. 10739-15 SUMMARY OF HISTOLOGIC FINDINGS FOR INDIVIDUAL ANIMALS

FEMALES
TUMOR AND NON-TUMOR PATHOLOGY
SCHEDULED AND UNSCHEDULED DEATHS

GROUP 1 - UNTREATED CONTROL SPECIES: RATS
DOSE AMOUNT: 0 PPM SOURCE: CHARLES RIVER (PORTAGE)
NUMBER OF ANIMALS: 20 STRAIN: COBS CD(SD) BR

ANIMAL NUMBER	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	6	6	6	6	6	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	9	9	9	9	9	0	0	0	0	0	0	0	0	0	1	1	1	1	1
	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4
DAYS ON STUDY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	1	1	1	1	1	1	0	0	0	0	0	0	0	0
DISPOSITION	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
URINARY SYSTEM																				
KIDNEYS	X	X	+	+	X	+	X	X	X	X	+	+	X	X	X	X	+	+	X	X
(TISSUE CONTINUED)																				
KIDNEY/PELVIS																				
INFLAMMATION, CHRONIC																	1			
FOCAL																				
MINERALIZATION												1								
URINARY BLADDER	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
REPRODUCTIVE SYSTEM (FEMALE ONLY)																				
CORPUS UTERI	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CERVIX UTERI	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
OVARIES	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
REPRODUCTIVE SYSTEM																				
MAMMARY GLAND	X	X	X	X	X	X	X	X	X	X	X	X	X	X	S	X	X	X	X	X

LITTON BIONETICS, INC.
PROJECT NO. 10734-15

SUMMARY OF HISTOLOGIC FINDINGS FOR INDIVIDUAL ANIMALS

MALES
TUMOR AND NON-TUMOR PATHOLOGY
SCHEDULED AND UNSCHEDULED DEATHS

GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
NUMBER OF ANIMALS: 20

SPECIES: RATS
SOURCE: CHARLES RIVER (PORTAGE)
STRAIN: COBS CD(SD) BR

ANIMAL NUMBER	86601	86602	86603	86604	86605	86606	86607	86608	86609	86610	86611	86612	86613	86614	86615	86616	86617	86618	86619	86620
DAYS ON STUDY	0009	0009	0009	0009	0009	0009	0009	0009	0009	0009	0009	0009	0009	0009	0009	0009	0009	0009	0009	0009
	2222	2222	2222	2222	2222	2211	1111	1111	1111	1111	1111	1100	0000	0000	0000	0000	0000	0000	0000	0000
DISPOSITION	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
CIRCULATORY SYSTEM																				
HEART	X	X	X	X	X	X	+	X	X	X	X	X	X	X	X	+	+	X	X	X
DEGENERATION, NOS							2									3	1			
DIGESTIVE SYSTEM																				
SUBMAXILLARY GLAND	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LIVER	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PANCREAS	X	X	X	X	+	X	X	X	X	X	X	+	+	X	X	X	X	X	+	X
INFLAMMATION, FOCAL					2							1	2							
PANCREATIC ACINUS ATROPHY, NOS																			2	
ESOPHAGUS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
STOMACH	+	+	+	+	+	X	+	+	+	+	+	+	+	+	+	X	X	+	X	+
INFLAMMATION, NOS	2	1	1	1	2		2	2	2	2	2	2	2	1			2			1
DUODENUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
JEJUNUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ILEUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
COLON	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 SUMMARY OF HISTOLOGIC FINDINGS FOR INDIVIDUAL ANIMALS

MALES
TUMOR AND NON-TUMOR PATHOLOGY
SCHEDULED AND UNSCHEDULED DEATHS

GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
NUMBER OF ANIMALS: 20

SPECIES: RATS
SOURCE: CHARLES RIVER (PORTAGE)
STRAIN: COBS CD(SD) BR

ANIMAL NUMBER	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	9
	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2
	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
DAYS ON STUDY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	2	1	1	1	1	1	1	1	0	0	0	0	0	0
DISPOSITION	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
DIGESTIVE SYSTEM																				
CECUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	+	X	
INFLAMMATION, NOS																			2	
ENDOCRINE SYSTEM																				
PITUITARY	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ADRENAL GLANDS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
THYROID	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
HEMATOPOIETIC SYSTEM																				
BONE MARROW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SPLEEN	+	X	+	X	X	+	X	X	X	+	X	X	X	X	X	X	X	+	X	X
HEMATOPOIESIS (EXTRAMEDULLARY)	2		2			2				2								2		
MESENTERIC LYMPH NODE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
THYMUS	X	X	X	X	X	X	S	X	X	X	X	X	X	S	X	X	X	X	X	X
INTEGUMENTARY SYSTEM																				
# SKIN	N	N	N	N	N	+	N	N	N	N	N	N	N	N	N	N	N	N	N	N

(TISSUE CONTINUED)

NOT SPECIFIED FOR HISTOPATHOLOGIC EXAMINATION UNLESS ABNORMAL

LITTON BIONETICS, INC.
PROJECT NO. 10734-15

SUMMARY OF HISTOLOGIC FINDINGS FOR INDIVIDUAL ANIMALS

MALES
TUMOR AND NON-TUMOR PATHOLOGY
SCHEDULED AND UNSCHEDULED DEATHS

GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
NUMBER OF ANIMALS: 20

SPECIES: RATS
SOURCE: CHARLES RIVER (PORTAGE)
STRAIN: COBS CD(SD) BR

ANIMAL NUMBER	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2
	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
DAYS ON STUDY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	1	1	1	1	1	1	1	0	0	0	0	0	0	0
DISPOSITION	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
INTEGUMENTARY SYSTEM																				
# SKIN	N	N	N	N	N	+	N	N	N	N	N	N	N	N	N	N	N	N	N	N
(TISSUE CONTINUED) INFLAMMATION, NOS						3														
SKIN OF MAMMARY GLAND	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MUSCULOSKELETAL SYSTEM																				
STERNUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RECTUS FEMORIS MUSCLE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NERVOUS SYSTEM																				
SCIATIC NERVE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CEREBRUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BRAIN STEM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CEREBELLUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CERVICAL SPINAL CORD	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
THORACIC SPINAL CORD	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

NOT SPECIFIED FOR HISTOPATHOLOGIC EXAMINATION UNLESS ABNORMAL

810508-055061.00 (0111-009

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 SUMMARY OF HISTOLOGIC FINDINGS FOR INDIVIDUAL ANIMALS

MALES
TUMOR AND NON-TUMOR PATHOLOGY
SCHEDULED AND UNSCHEDULED DEATHS

GROUP 1 - UNTREATED CONTROL SPECIES: RATS
DOSE AMOUNT: 0 PPM SOURCE: CHARLES RIVER (PORTAGE)
NUMBER OF ANIMALS: 20 STRAIN: COBS CD(SD) BR

ANIMAL NUMBER	8 6 1 0	8 6 1 1	8 6 1 2	8 6 1 3	8 6 1 4	8 6 1 5	8 6 1 6	8 6 1 7	8 6 1 8	8 6 1 9	8 6 2 0	8 6 2 1	8 6 2 2	8 6 2 3	8 6 2 4	8 6 2 5	8 6 2 6	8 6 2 7	8 6 2 8	8 6 2 9
DAYS ON STUDY	0 0 9 2	0 0 9 2	0 0 9 2	0 0 9 2	0 0 9 2	0 0 9 2	0 0 9 2	0 1 9 2	0 1 9 2	0 1 9 2	0 1 9 2	0 1 9 2	0 1 9 2	0 1 9 2	0 0 9 2	0 0 9 2	0 0 9 2	0 0 9 2	0 0 9 2	0 0 9 2
DISPOSITION	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
RESPIRATORY SYSTEM																				
LUNGS	+	+	X	X	X	+	+	+	+	+	+	X	+	X	X	+	+	+	+	
HISTIOCYTOSIS							2						2						1	
BLOOD VESSEL																				
MINERALIZATION									1										1	
LYMPHOCYTIC INFLAMMATORY INFILTRATE	+	+			+		+	+	+	+			+				+	+		+
TRACHEA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SPECIAL SENSES SYSTEM																				
LEFT EYE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	S	X	
URINARY SYSTEM																				
KIDNEYS	X	X	X	X	X	X	X	X	X	+	+	+	X	X	X	X	+	X	+	+
HYDRONEPHROSIS									2	3							+			2
INFLAMMATION, FOCAL												1								
INTERSTITIAL TISSUE OF KIDNEY																				
MULTIFOCAL																				
INFLAMMATION, INTERSTITIAL																	2			
KIDNEY/CORTEX																				
CYST, NOS																			•	
URINARY BLADDER	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

LITTON BIONETICS, INC.
PROJECT NO. 10736-15

SUMMARY OF HISTOLOGIC FINDINGS FOR INDIVIDUAL ANIMALS

MALES
TUMOR AND NON-TUMOR PATHOLOGY
SCHEDULED AND UNSCHEDULED DEATHS

GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
NUMBER OF ANIMALS: 20

SPECIES: RATS
SOURCE: CHARLES RIVER (PORTAGE)
STRAIN: COBS CD(SD) BR

ANIMAL NUMBER	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2
	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
DAYS ON STUDY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	2	1	1	1	1	1	1	1	0	0	0	0	0	0
DISPOSITION	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
REPRODUCTIVE SYSTEM (MALE ONLY)																			
TESTES	X	X	X	X	X	X	X	X	X	X	X	X	+	X	X	X	X	X	X
FOCAL MINERALIZATION													1						
PROSTATE	X	X	X	+	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INFLAMMATION, NOS				3															
REPRODUCTIVE SYSTEM																			
MAMMARY GLAND	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	S	X	X

B10508-055061.00 (0101-011

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 SUMMARY OF HISTOLOGIC FINDINGS FOR INDIVIDUAL ANIMALS

FEMALES
TUMOR AND NON-TUMOR PATHOLOGY
SCHEDULED AND UNSCHEDULED DEATHS

GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
NUMBER OF ANIMALS: 20

SPECIES: RATS
SOURCE: CHARLES RIVER (PORTAGE)
STRAIN: CDBS CD(SD) BR

ANIMAL NUMBER	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	5	5	5	5	6	6	6	6	6	6	6	6	6	6	7	7	7	7	7
	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4
DAYS ON STUDY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	1	1	1	1	1	1	0	0	0	0	0	0	0	0
DISPOSITION	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
CIRCULATORY SYSTEM																				
HEART	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	+	X	X	X	
DEGENERATION, NOS																1				
DIGESTIVE SYSTEM																				
SUBMAXILLARY GLAND	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LIVER	X	X	X	X	X	X	X	X	X	X	X	X	+	X	+	X	X	X	X	X
INFLAMMATION, FOCAL															2					
LIVER/CENTRILOBULAR BASOPHILIC STIPPLING													2							
PANCREAS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ESOPHAGUS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
STOMACH	+	X	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
INFLAMMATION, NOS	2		2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	3	
DUODENUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
JEJUNUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ILEUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
COLON	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

LITTON BIONETICS, INC.
PROJECT NO. 10734-15

SUMMARY OF HISTOLOGIC FINDINGS FOR INDIVIDUAL ANIMALS

FEMALES
TUMOR AND NON-TUMOR PATHOLOGY
SCHEDULED AND UNSCHEDULED DEATHS

GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
NUMBER OF ANIMALS: 20

SPECIES: RATS
SOURCE: CHARLES RIVER (PORTAGE)
STRAIN: COBS CD(SD) BR

ANIMAL NUMBER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	5	5	5	5	5	6	6	6	6	6	6	6	6	6	7	7	7	7	7
	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4
DAYS ON STUDY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	2	1	1	1	1	1	1	0	0	0	0	0	0	0
DISPOSITION	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
DIGESTIVE SYSTEM																				
CECUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	+
INFLAMMATION, NOS																				2
ENDOCRINE SYSTEM																				
PITUITARY	X	X	X	X	+	X	X	X	X	X	X	X	X	+	X	X	X	X	X	X
CYST, NOS					1									1						
ADRENAL GLANDS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
THYROID	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
HEMATOPOIETIC SYSTEM																				
BONE MARROW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SPLEEN	+	+	+	+	+	+	+	+	X	X	X	X	X	+	+	+	+	+	X	X
HEMOSIDEROSIS														2	2	2	2	2		
HEMATOPOIESIS (EXTRAMEDULLARY)	3	3	1	3	2	2	3	2												
MESENTERIC LYMPH NODE	X	X	X	X	X	X	+	X	X	X	X	X	X	X	X	X	X	X	X	X
INFLAMMATION, GRANULOMATOUS							3													
THYMUS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

LITTON BIONETICS, INC.
PROJECT NO. 10739-15

SUMMARY OF HISTOLOGIC FINDINGS FOR INDIVIDUAL ANIMALS

FEMALES
TUMOR AND NON-TUMOR PATHOLOGY
SCHEDULED AND UNSCHEDULED DEATHS

GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
NUMBER OF ANIMALS: 20

SPECIES: RATS
SOURCE: CHARLES RIVER (PORTAGE)
STRAIN: CDBS CD(SD) BR

ANIMAL NUMBER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	5	5	5	5	6	6	6	6	6	6	6	6	6	6	7	7	7	7	7
	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4
DAYS ON STUDY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	2	1	1	1	1	1	0	0	0	0	0	0	0	0
DISPOSITION	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
INTEGUMENTARY SYSTEM																				
SKIN OF MAMMARY GLAND	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MUSCULOSKELETAL SYSTEM																				
STERNUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RECTUS FEMORIS MUSCLE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	+
MULTIFOCAL DEGENERATION, NOS																				1
NERVOUS SYSTEM																				
SCIATIC NERVE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CEREBRUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BRAIN STEM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CEREBELLUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CERVICAL SPINAL CORD	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
THORACIC SPINAL CORD	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 SUMMARY OF HISTOLOGIC FINDINGS FOR INDIVIDUAL ANIMALS

FEMALES
TUMOR AND NON-TUMOR PATHOLOGY
SCHEDULED AND UNSCHEDULED DEATHS

GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
NUMBER OF ANIMALS: 20

SPECIES: RATS
SOURCE: CHARLES RIVER (PORTAGE)
STRAIN: CDBS CD(SD) BR

ANIMAL NUMBER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	7	7	7	7	7
	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4
DAYS ON STUDY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	1	1	1	1	1	1	0	0	0	0	0	0	0	0
DISPOSITION	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
RESPIRATORY SYSTEM																				
LUNGS	+	X	X	+	+	X	+	+	+	+	X	+	+	+	+	+	X	+	+	+
BLOOD VESSEL																				
LYMPHOCYTIC INFLAMMATORY INFILTRATE	+			+	+		+	+	+	+		+	+	+	+	+		+	+	+
BLOOD VESSEL																				
FOCAL																				
MINERALIZATION																		2		
TRACHEA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SPECIAL SENSES SYSTEM																				
LEFT EYE	X	+	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PERIORBITAL REGION																				
INFLAMMATION, NOS		3																		
URINARY SYSTEM																				
KIDNEYS	X	+	X	X	X	+	X	+	X	X	+	X	X	X	X	X	X	X	+	+
HYDRONEPHROSIS						2														
BLOOD VESSEL																				
LYMPHOCYTIC INFLAMMATORY INFILTRATE		•																		
KIDNEY/PELVIS																				
MINERALIZATION								3											2	
INFLAMMATION, NOS										3										
INFLAMMATION, ACUTE																			2	
FOCAL																				
INFLAMMATION, INTERSTITIAL																		2		

LITTON BIONETICS, INC.
PROJECT NO. 10734-15

SUMMARY OF HISTOLOGIC FINDINGS FOR INDIVIDUAL ANIMALS

FEMALES
TUMOR AND NON-TUMOR PATHOLOGY
SCHEDULED AND UNSCHEDULED DEATHS

GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
NUMBER OF ANIMALS: 20

SPECIES: RATS
SOURCE: CHARLES RIVER (PORTAGE)
STRAIN: CDBS CD(SD) BR

ANIMAL NUMBER	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	5	5	5	5	5	6	6	6	6	6	6	6	6	6	7	7	7	7
	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4
DAYS ON STUDY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	2	1	1	1	1	1	1	0	0	0	0	0	0	0
DISPOSITION	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
URINARY SYSTEM																				
URINARY BLADDER	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
REPRODUCTIVE SYSTEM (FEMALE ONLY)																				
CORPUS UTERI	X	•	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
DILATATION, NOS		•																		
CERVIX UTERI	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
OVARIES	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
REPRODUCTIVE SYSTEM																				
MAMMARY GLAND	X	X	X	X	S	X	S	X	X	X	X	X	X	X	X	X	X	X	X	X

A10508-055061.00 (0111-016

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 SUMMARY OF HISTOLOGIC FINDINGS FOR INDIVIDUAL ANIMALS

GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
NUMBER OF ANIMALS: 20

SPECIES: RATS
SOURCE: CHARLES RIVER (PORTAGE)
STRAIN: CORS CD(SD) BR

MALES
TUMOR AND NON-TUMOR PATHOLOGY
SCHEDULED AND UNSCHEDULED DEATHS

ANIMAL NUMBER	8 6 7 0	8 6 7 1	8 6 7 2	8 6 7 3	8 6 7 4	8 6 7 5	8 6 7 6	8 6 7 7	8 6 7 8	8 6 7 9	8 6 8 0	8 6 8 1	8 6 8 2	8 6 8 3	8 6 8 4	8 6 8 5	8 6 8 6	8 6 8 7	8 6 8 8	8 6 8 9
DAYS ON STUDY	0 0 9 2	0 0 9 2	0 0 9 2	0 0 9 2	0 0 9 2	0 0 9 2	0 0 9 2	0 0 9 1	0 0 9 1	0 0 9 1	0 0 9 1	0 0 9 1	0 0 9 1	0 0 9 1	0 0 9 0	0 0 9 0	0 0 9 0	0 0 9 0	0 0 9 0	0 0 9 0
DISPOSITION	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
CIRCULATORY SYSTEM																				
HEART	X	X	X	•	X	•	•	X	X	X	X	X	•	•	X	X	X	X	X	X
DEGENERATION, NOS				2		1	1						1	1						
DIGESTIVE SYSTEM																				
SUBMAXILLARY GLAND	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LIVER	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PANCREAS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	•	X	X	X	X	X
INFLAMMATION, FOCAL															1					
ESOPHAGUS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
STOMACH	•	•	•	X	•	•	X	•	•	•	•	•	X	•	X	X	•	•	•	•
INFLAMMATION, NOS	2	2	2		2	2		2	2	1	2	2		2			2	2	2	1
DUODENUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
JEJUNUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ILEUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
COLON	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CECUM	X	X	X	X	X	X	X	•	X	X	•	X	X	•	•	X	X	X	X	X
INFLAMMATION, NOS								2			2			2	2					

A10568-055061.00 (0191-017

LITTON BIONETICS, INC.
PROJECT NO. 10739-15

SUMMARY OF HISTOLOGIC FINDINGS FOR INDIVIDUAL ANIMALS

MALES
TUMOR AND NON-TUMOR PATHOLOGY
SCHEDULED AND UNSCHEDULED DEATHS

GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
NUMBER OF ANIMALS: 20

SPECIES: RATS
SOURCE: CHARLES RIVER (PORTAGE)
STRAIN: COBS CD(SD) BR

ANIMAL NUMBER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	7	7	7	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	8	8
	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
DAYS ON STUDY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	1	1	1	1	1	1	1	0	0	0	0	0	0	0
DISPOSITION	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
ENDOCRINE SYSTEM																				
PITUITARY	X	X	X	X	X	X	X	X	X	X	X	X	X	S	X	X	X	X	X	
ADRENAL GLANDS	X	X	X	X	S	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
THYROID	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
HEMATOPOIETIC SYSTEM																				
BONE MARROW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
SPLEEN	•	•	X	•	X	•	•	X	X	X	•	X	X	•	•	X	X	X	X	•
HEMATOPOIESIS (EXTRAMEDULLARY)	2	2		2		2	2				2			2	1					2
MESENTERIC LYMPH NODE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
THYMUS	X	X	X	X	X	X	X	X	X	S	X	X	X	X	X	X	X	X	X	
INTEGUMENTARY SYSTEM																				
SKIN OF MAMMARY GLAND	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
MUSCULOSKELETAL SYSTEM																				
STERNUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
RECTUS FEMORIS MUSCLE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

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LITTON BIONETICS, INC.
PROJECT NO. 10734-15

SUMMARY OF HISTOLOGIC FINDINGS FOR INDIVIDUAL ANIMALS

MALES
TUMOR AND NON-TUMOR PATHOLOGY
SCHEDULED AND UNSCHEDULED DEATHS

GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
NUMBER OF ANIMALS: 20

SPECIES: RATS
SOURCE: CHARLES RIVER (PORTAGE)
STRAIN: COBS CD(SD) BR

ANIMAL NUMBER	8670	8671	8672	8673	8674	8675	8676	8677	8678	8679	8680	8681	8682	8683	8684	8685	8686	8687	8688	8689
DAYS ON STUDY	0092	0092	0092	0092	0092	0092	0091	0091	0091	0091	0091	0091	0091	0091	0090	0090	0090	0090	0090	0090
DISPOSITION	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
NERVOUS SYSTEM																				
SCIATIC NERVE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CEREBRUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BRAIN STEM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CEREBELLUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CERVICAL SPINAL CORD	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
THORACIC SPINAL CORD	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RESPIRATORY SYSTEM																				
LUNGS	+	+	+	+	+	+	X	+	+	X	+	+	+	+	X	+	+	X	+	+
INFLAMMATION, NOS												1								
INFLAMMATION, FOCAL														1						
HISTIOCYTOSIS										2										1
BLOOD VESSEL																				
MINERALIZATION		1	1		1								2	1						
LYMPHOCYTIC INFLAMMATORY INFILTRATE	+	+		+	+	+		+	+		+		+			+	+		+	
TRACHEA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

LITTON BIONETICS, INC.
PROJECT NO. 10734-15

SUMMARY OF HISTOLOGIC FINDINGS FOR INDIVIDUAL ANIMALS

MALES
TUMOR AND NON-TUMOR PATHOLOGY
SCHEDULED AND UNSCHEDULED DEATHS

GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
NUMBER OF ANIMALS: 20

SPECIES: RATS
SOURCE: CHARLES RIVER (PORTAGE)
STRAIN: CDBS CD(SD) BR

ANIMAL NUMBER	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	7	7	7	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	8
	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	9	9
DAYS ON STUDY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	2	1	1	1	1	1	1	1	0	0	0	0	0	0
DISPOSITION	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
SPECIAL SENSES SYSTEM																				
LEFT EYE	X	X	X	X	X	X	+	X	X	X	X	X	X	X	X	X	X	X	X	X
INFLAMMATION, ACUTE							1													
EYE/CORNEA								5												
INFLAMMATION, ACUTE																				
URINARY SYSTEM																				
KIDNEYS	+	X	X	X	+	X	X	X	+	X	X	X	X	X	+	X	+	X	X	
HYDRONEPHROSIS					1										5					
INFLAMMATION, FOCAL															1					
KIDNEY/CORTEX									1											
CYST, NOS																				
KIDNEY/PELVIS																		2		
MINERALIZATION																				
FOCAL	1																			
MINERALIZATION																				
URINARY BLADDER	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
REPRODUCTIVE SYSTEM (MALE ONLY)																				
TESTES	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PROSTATE	X	X	X	X	+	X	X	X	X	X	+	X	X	X	X	X	X	X	X	X
INFLAMMATION, NOS					2						2									

LITTON BIONETICS, INC.
PROJECT NO. 10736-15

SUMMARY OF HISTOLOGIC FINDINGS FOR INDIVIDUAL ANIMALS

MALES
TUMOR AND NON-TUMOR PATHOLOGY
SCHEDULED AND UNSCHEDULED DEATHS

GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
NUMBER OF ANIMALS: 20

SPECIES: RATS
SOURCE: CHARLES RIVER (PORTAGE)
STRAIN: CDBS CD(SD) BR

ANIMAL NUMBER	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	9
	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	7	7	7	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	8	8
	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
DAYS ON STUDY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	2	1	1	1	1	1	1	1	0	0	0	0	0	0
DISPOSITION	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
REPRODUCTIVE SYSTEM																				
MAMMARY GLAND	X	X	X	X	S	S	X	X	X	X	X	X	X	X	X	X	X	X	S	

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8610 SEX: MALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 484.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04051
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8611 SEX: MALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 454.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04052
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MINIMAL)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8612 SEX: MALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 481.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04053
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

LEFT EYE
RED CRUST AROUND LEFT EYE

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MINIMAL)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MILD)
LEFT EYE
TISSUE EXAMINED, NO LESIONS FOUND

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8613 SEX: MALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 464.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04054
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MINIMAL)
PROSTATE
INFLAMMATION, NOS
(MODERATE)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8614 SEX: MALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 501.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04055
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

PANCREAS
INFLAMMATION, FOCAL
(MILD)
STOMACH
INFLAMMATION, NOS
(MILD)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8615 SEX: MALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 374.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04056
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

SKIN
SCAB ON SKIN BELOW RIGHT EAR (1.0 CM IN DIAMETER), RIGHT EARTAG INFECTION
LUNGS
PINPOINT WHITE FOCI ON ALL LOBES

MICROSCOPIC FINDINGS:

SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MILD)
SKIN
INFLAMMATION, NOS
(MODERATE)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8616 SEX: MALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 437.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04057
SPECIES: RATS
STRAIN: CDBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

HEART
DEGENERATION, NOS
(MILD)
STOMACH
INFLAMMATION, NOS
(MILD)
LUNGS
HISTIOCYTOSIS
(MILD)

COMMENTS:

CRUST AROUND LEFT EYE NOT APPARENT AT NECROPSY

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8617 SEX: MALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 460.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04058
SPECIES: RATS
STRAIN: CDBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

TISSUE(S) MISSING OR SEVERELY AUTOLYZED:

THYMUS
SECTION AND/OR TISSUE NOT PRESENT

COMMENTS:

RIGHT EARTAG REPLACED (ALSO #8617)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8618 SEX: MALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 502.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04059
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
LUNGS
BLOOD VESSEL
MINERALIZATION
(MINIMAL)
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8619 SEX: MALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 512.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04060
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE
KIDNEYS
HYDRONEPHROSIS
(MILD)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8620 SEX: MALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 466.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04061
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE
KIDNEYS
HYDRONEPHROSIS
(MODERATE)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8621 SEX: MALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 495.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04062
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

PANCREAS
INFLAMMATION, FOCAL
(MINIMAL)
STOMACH
INFLAMMATION, NOS
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE
KIDNEYS
INFLAMMATION, FOCAL
(MINIMAL)

LITTON BIONETICS, INC.
PROJEC NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8622 SEX: MALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 478.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04063
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

PANCREAS
INFLAMMATION, FOCAL
(MILD)
STOMACH
INFLAMMATION, NOS
(MILD)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8622 SEX: MALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 478.000 GRAMS

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
LUNGS
HISTIOCYTOSIS
(MILD)
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE
TESTES
FOCAL
MINERALIZATION
(MINIMAL)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8624 SEX: MALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 504.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04065
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
RIGHT EARTAG INFECTION

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MINIMAL)

TISSUE(S) MISSING OR SEVERELY AUTOLYZED:

THYMUS
SECTION AND/OR TISSUE NOT PRESENT

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8625 SEX: MALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 395.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04066
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
TEETH CUT
CRUST AND SWELLING AT EARTAG SITE
LUNGS
DAMAGED (NOTED AT TRIMMING)

MICROSCOPIC FINDINGS:

HEART
DEGENERATION, NOS
(MODERATE)
LUNGS
TISSUE EXAMINED, NO LESIONS FOUND

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8626 SEX: MALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 455.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04067
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

KIDNEYS
LEFT KIDNEY DILATED, CONTAINS GREEN FLUID IN PELVIC AREA

MICROSCOPIC FINDINGS:

HEART
DEGENERATION, NOS
(MINIMAL)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE
KIDNEYS
HYDRONEPHROSIS
INTERSTITIAL TISSUE OF KIDNEY
MULTIFOCAL
INFLAMMATION, INTERSTITIAL
(MILD)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8627 SEX: MALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 509.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04068
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
EARTAG INFECTION

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

TISSUE(S) MISSING OR SEVERELY AUTOLYZED:

MAMMARY GLAND
SECTION AND/OR TISSUE NOT PRESENT

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8628 SEX: MALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 479.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04069
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

PANCREAS
PANCREATIC ACINUS
ATROPHY, NOS
(MILD)
CECUM
INFLAMMATION, NOS
(MILD)
LUNGS
HISTIOCYTOSIS
(MINIMAL)
BLOOD VESSEL
MINERALIZATION
(MINIMAL)
KIDNEYS
KIDNEY/CORTEX
CYST, NOS

TISSUE(S) MISSING OR SEVERELY AUTOLYZED:

LEFT EYE
SECTION AND/OR TISSUE NOT PRESENT

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8629 SEX: MALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 424.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04070
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MINIMAL)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE
KIDNEYS
HYDRONEPHROSIS
(MILD)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8630 SEX: MALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 472.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
RIGHT EAR THICKENED

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8631 SEX: MALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 460.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8632 SEX: MALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 486.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8633 SEX: MALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 453.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8634 SEX: MALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 459.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
RIGHT EARTAG INFECTION

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8635 SEX: MALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 455.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8636 SEX: MALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 471.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8637 SEX: MALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 411.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
RIGHT EARTAG INFECTION

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8638 SEX: MALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 471.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8639 SEX: MALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 503.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8640 SEX: MALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 414.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8641 SEX: MALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 538.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8642 SEX: MALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 429.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
RIGHT EARTAG INFECTION

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8643 SEX: MALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 536.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8644 SEX: MALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 369.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8645 SEX: MALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 489.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8646 SEX: MALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 461.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8647 SEX: MALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 444.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
RIGHT EARTAG INFECTION

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8648 SEX: MALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 485.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: CCBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8649 SEX: MALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 462.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: CCBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8650 SEX: MALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 447.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8651 SEX: MALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 540.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
RIGHT EARTAG INFECTION

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8652 SEX: MALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 412.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8653 SEX: MALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 453.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8654 SEX: MALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 447.000 GRAMS

PATHOLOGY REFERENCE NO. 0- C
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8655 SEX: MALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 463.000 GRAMS

PATHOLOGY REFERENCE NO. 0- C
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8656 SEX: MALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 521.000 GRAMS

PATHOLOGY REFERENCE NO. 0- C
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8657 SEX: MALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 452.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
RIGHT EARTAG INFECTION

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8658 SEX: MALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 489.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8659 SEX: MALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 488.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8660 SEX: MALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 468.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8661 SEX: MALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 482.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
RIGHT EARTAG INFECTION

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8662 SEX: MALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 492.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
TEETH CUT

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8663 SEX: MALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 422.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
EARTAG INFECTION
TEETH CUT

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8664 SEX: MALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 502.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8665 SEX: MALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 547.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
RIGHT EARTAG INFECTION

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8666 SEX: MALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 470.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
CRUST AND SWELLING AT EARTAG SITE

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8667 SEX: MALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 498.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
EARTAG INFECTION

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8668 SEX: MALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 515.000 GRAMS

PATHOLOGY REFERENCE NO. 0- C
SPECIES: RATS
STRAIN: CDBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

LUNGS
PINPOINT WHITE FOCI ON ALL LOBES

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8669 SEX: MALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 553.000 GRAMS

PATHOLOGY REFERENCE NO. 0- C
SPECIES: RATS
STRAIN: CDBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8670 SEX: MALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 416.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04091
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE
KIDNEYS
FOCAL
MINERALIZATION
(MINIMAL)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8671 SEX: MALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 446.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04092
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
HAIR LOSS, FORE LIPBS

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MILD)
LUNGS
BLOOD VESSEL
MINERALIZATION
(MINIMAL)
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8672 SEX: MALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 418.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04093
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
LUNGS
BLOOD VESSEL
MINERALIZATION
(MINIMAL)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8673 SEX: MALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 503.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04094
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
EARTAG SITE SWOLLEN, ENCRUSTED

MICROSCOPIC FINDINGS:

HEART
DEGENERATION, NOS
(MILD)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8674 SEX: MALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 506.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04095
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
LUNGS
BLOOD VESSEL
MINERALIZATION
(MINIMAL)
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE
KIDNEYS
HYDRONEPHROSIS
PROSTATE
INFLAMMATION, NOS
(MILD)

TISSUE(S) MISSING OR SEVERELY AUTOLYZED:

ADRENAL GLANDS
SECTION AND/OR TISSUE NOT PRESENT
MAMMARY GLAND
SECTION AND/OR TISSUE NOT PRESENT

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8675 SEX: MALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 424.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04096
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
SUBCUTANEOUS THICK RED FLUID, RIGHT EYE
RED CRUST AROUND RIGHT EYE

MICROSCOPIC FINDINGS:

HEART
DEGENERATION, NOS
(MINIMAL)
STOMACH
INFLAMMATION, NOS
(MILD)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

TISSUE(S) MISSING OR SEVERELY AUTOLYZED:

MAMMARY GLAND
SECTION AND/OR TISSUE NOT PRESENT

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8676 SEX: MALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 457.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04097
SPECIES: RATS
STRAIN: CORS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
SUBCUTANEOUS ACCUMULATION OF BLOOD ABOVE SKULL
RIGHT EYE ULCERATED, YELLOW, PROTRUDING

MICROSCOPIC FINDINGS:

HEART
DEGENERATION, NOS
(MINIMAL)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MILD)
LEFT EYE
INFLAMMATION, ACUTE
EYE/CORNEA
INFLAMMATION, ACUTE
(SEVERE)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8677 SEX: MALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 404.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04096
SPECIES: RATS
STRAIN: CORS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
CECUM
INFLAMMATION, NOS
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8678 SEX: MALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 463.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04099
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
LUNGS
HISTIOCYTOSIS
(MILD)
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE
KIDNEYS
KIDNEY/CORTEX
CYST, NOS

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8679 SEX: MALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 435.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04100
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
RIGHT EARTAG INFECTION

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MINIMAL)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8680 SEX: MALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 429.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04101
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
TEETH CUT
RED CRUST AROUND RIGHT EYE

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
CECUM
INFLAMMATION, NOS
(MILD)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

TISSUE(S) MISSING OR SEVERELY AUTOLYZED:

THYMUS
SECTION AND/OR TISSUE NOT PRESENT

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8681 SEX: MALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 444.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04102
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
RIGHT EAR THICKENED

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
LUNGS
INFLAMMATION, NOS
(MINIMAL)
PROSTATE
INFLAMMATION, NOS
(MILD)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8682 SEX: MALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 454.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04103
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
RIGHT EAR THICKENED

MICROSCOPIC FINDINGS:

HEART
DEGENERATION, NOS
(MINIMAL)
LUNGS
BLOOD VESSEL
MINERALIZATION
(MILD)
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8683 SEX: MALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 448.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04104
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
RIGHT EARTAG INFECTION

MICROSCOPIC FINDINGS:

HEART
DEGENERATION, NOS
(MINIMAL)
STOMACH
INFLAMMATION, NOS
(MILD)
CECUM
INFLAMMATION, NOS
(MILD)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MILD)
LUNGS
INFLAMMATION, FOCAL
(MINIMAL)
BLOOD VESSEL
MINERALIZATION
(MINIMAL)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8684 SEX: MALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 402.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04105
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

PANCREAS
INFLAMMATION, FOCAL
(MINIMAL)
CECUM
INFLAMMATION, NOS
(MILD)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MINIMAL)
KIDNEYS
HYDRONEPHROSIS
(MODERATE)

TISSUE(S) MISSING OR SEVERELY AUTOLYZED:

PITUITARY
SECTION AND/OR TISSUE NOT PRESENT

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8685 SEX: MALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 388.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04106
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
RIGHT EARTAG INFECTION

MICROSCOPIC FINDINGS:

LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE
KIDNEYS
INFLAMMATION, FOCAL
(MODERATE)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8686 SEX: MALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 429.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04107
SPECIES: RATS
STRAIN: CORS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
EARTAG INFECTION

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8687 SEX: MALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 429.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04108
SPECIES: RATS
STRAIN: CORS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
KIDNEYS
KIDNEY/PELVIS
MINERALIZATION
(MILD)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8688 SEX: MALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 503.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04109
SPECIES: RATS
STRAIN: COBS CD(SD) BP
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
RIGHT EAR THICKENED

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8689 SEX: MALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 369.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04110
SPECIES: RATS
STRAIN: COBS CD(SD) BP
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
RIGHT EAR THICKENED, EARTAG INFECTION
LUNGS
PINPOINT WHITE FOCI ON ALL LOBES

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MINIMAL)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MILD)
LUNGS
HISTIOCYTOSIS
(MINIMAL)

TISSUE(S) MISSING OR SEVERELY AUTOLYZED:

MAMMARY GLAND
SECTION AND/OR TISSUE NOT PRESENT

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8695 SEX: FEMALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 249.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04071
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MODERATE)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8696 SEX: FEMALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 0.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04072
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MINIMAL)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MODERATE)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8697 SEX: FEMALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 272.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04073
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

LIVER
INFLAMMATION, MULTIFOCAL
(MINIMAL)
HEMATOPOIESIS (EXTRAMEDULLARY)
(MINIMAL)
STOMACH
INFLAMMATION, NOS
(MINIMAL)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MODERATE)
LUNGS
FOCAL
HISTIOCYTOSIS
(MINIMAL)
KIDNEYS
INFLAMMATION, CHRONIC FOCAL
(MINIMAL)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8698 SEX: FEMALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 275.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04074
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

LUNGS
LUNGS SMALL AND MOTTLED (NOTED AT TRIMMING)

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MINIMAL)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MODERATE)
MESENTERIC LYMPH NODE
PLASMACYTOSIS
(MODERATE)
LUNGS
INFLAMMATION, CHRONIC FOCAL
(MODERATE)
KIDNEYS
HYDRONEPHROSIS
KIDNEY/PELVIS
CALCULUS, NOS

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8699 SEX: FEMALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 266.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04075
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

HEART
DEGENERATION, NOS
(MINIMAL)
STOMACH
INFLAMMATION, NOS
(MILD)
ILEUM
HYPERPLASIA, LYMPHOID
(MODERATE)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MODERATE)
LUNGS
PNEUMONIA, CHRONIC MURINE
(MILD)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8700 SEX: FEMALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 296.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04076
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

LIVER
SMALL YELLOW NODULES ON LEFT MEDIAN LOBE (NOTED AT TRIMMING)

MICROSCOPIC FINDINGS:

LIVER
METAMORPHOSIS, FATTY
(MINIMAL)
STOMACH
INFLAMMATION, NOS
(MILD)
LUNGS
FOCAL
HISTIOCYTOSIS
(MINIMAL)
KIDNEYS
HYDRONEPHROSIS

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8701 SEX: FEMALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 231.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04077
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MINIMAL)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MILD)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8702 SEX: FEMALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 228.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04078
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MINIMAL)
SPLEEN
HEMOSIDEROSIS
(MILD)
LUNGS
HISTIOCYTOSIS
(MINIMAL)
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8703 SEX: FEMALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 241.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04079
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MINIMAL)
SPLEEN
HEMOSIDEROSIS
(MILD)
LUNGS
HISTIOCYTOSIS
(MINIMAL)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8704 SEX: FEMALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 273.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04080
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

SPLEEN
HEMOSIDEROSIS
(MODERATE)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8705 SEX: FEMALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 239.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04081
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MINIMAL)
SPLEEN
HEMOSIDEROSIS
(MODERATE)
LUNGS
HISTIOCYTOSIS
(MINIMAL)
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE
KIDNEYS
NEPHROPATHY
(MINIMAL)

TISSUE(S) MISSING OR SEVERELY AUTOLYZED:

THYROID
SECTION AND/OR TISSUE NOT PRESENT

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8706 SEX: FEMALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 249.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04082
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

LIVER
MULTIFOCAL
LYMPHOCYTIC INFLAMMATORY INFILTRATE
(MINIMAL)
SPLEEN
HEMOSIDEROSIS
(MILD)
KIDNEYS
FOCAL
MINERALIZATION
(MINIMAL)

TISSUE(S) MISSING OR SEVERELY AUTOLYZED:

LEFT EYE
SECTION AND/OR TISSUE NOT PRESENT

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8707 SEX: FEMALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 234.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04083
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
SPLEEN
HEMOSIDEROSIS
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8708 SEX: FEMALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 248.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04084
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
SPLEEN
HEMOSIDEROSIS
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8709 SEX: FEMALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 245.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04085
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8710 SEX: FEMALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 256.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04086
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)

TISSUE(S) MISSING OR SEVERELY AUTOLYZED:

MAMMARY GLAND
SECTION AND/OR TISSUE NOT PRESENT

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8711 SEX: FEMALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 210.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04087
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
TEETH CUT

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MINIMAL)
SPLEEN
HEMOSIDEROSIS
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE
KIDNEYS
INFLAMMATION, FOCAL
(MINIMAL)
KIDNEY/PELVIS
INFLAMMATION, CHRONIC
(MINIMAL)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8712 SEX: FEMALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 216.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04088
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
TEETH CUT

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
SPLEEN
HEMOSIDEROSIS
(MILD)
RECTUS FEMORIS MUSCLE
DEGENERATION, NOS
(MINIMAL)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE
KIDNEYS
KIDNEY/CORTEX
CYST, NOS

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8713 SEX: FEMALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 234.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04089
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8714 SEX: FEMALE
GROUP 1 - UNTREATED CONTROL
DOSE AMOUNT: 0 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 237.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04090
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
TEETH CUT

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8715 SEX: FEMALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 243.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8716 SEX: FEMALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 243.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8717 SEX: FEMALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 260.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8718 SEX: FEMALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 283.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8719 SEX: FEMALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 241.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8720 SEX: FEMALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 240.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8721 SEX: FEMALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 253.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8722 SEX: FEMALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 208.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
RIGHT EAR ENLARGED, EARTAG SITE SWOLLEN

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8723 SEX: FEMALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 259.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

UTERUS
BOTH HORNS FILLED WITH CLEAR FLUID

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8724 SEX: FEMALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 220.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8725 SEX: FEMALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 241.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

SKIN
FLAKY ON TAIL

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8726 SEX: FEMALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 297.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

LUNGS
NUMEROUS PINPOINT WHITE FOCI ON ALL LOBES

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8727 SEX: FEMALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 223.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: CDBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8728 SEX: FEMALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 277.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: CDBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

SKIN
SKIN FLAKY ON TAIL

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8729 SEX: FEMALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 266.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: CDRS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8730 SEX: FEMALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 305.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: CDBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8731 SEX: FEMALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 218.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8732 SEX: FEMALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 281.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8733 SEX: FEMALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 245.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

LUNGS
PINPOINT WHITE FOCI ON ALL LOBES

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8734 SEX: FEMALE
GROUP 2 - LOW DOSE
DOSE AMOUNT: 300 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 266.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8735 SEX: FEMALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 243.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
RIGHT EARTAG INFECTION

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8736 SEX: FEMALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 250.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8737 SEX: FEMALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 281.000 GRAMS

PATHOLOGY REFERENCE NO. 0- C
SPECIES: RATS
STRAIN: CDRS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

EARS
THICKENED

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8738 SEX: FEMALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 292.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: CDBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8739 SEX: FEMALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 210.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
HAIR LOSS, FORELIMBS
RIGHT EYE
HAIR LOSS AROUND AND RED CRUST ON CORNEA

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8740 SEX: FEMALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 231.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
BOTH EARS THICKENED, RIGHT ENLARGED

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8741 SEX: FEMALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 237.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8742 SEX: FEMALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 251.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8743 SEX: FEMALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 297.000 GRAMS

PATHOLOGY REFERENCE NO. 0- C
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8744 SEX: FEMALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 245.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8745 SEX: FEMALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 219.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: CDBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8746 SEX: FEMALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 274.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: CDBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8747 SEX: FEMALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 234.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8748 SEX: FEMALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 270.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

COMMENTS:

MASS ABOVE NOSE AND FLAKY, SCABBY TAIL NOT APPARENT AT NECROSPY

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8749 SEX: FEMALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 234.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8750 SEX: FEMALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 257.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8751 SEX: FEMALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 216.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8752 SEX: FEMALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 266.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8753 SEX: FEMALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 288.000 GRAMS

PATHOLOGY REFERENCE NO. 0- C
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DICXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8754 SEX: FEMALE
GROUP 3 - MEDIUM DOSE
DOSE AMOUNT: 1000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 242.000 GRAMS

PATHOLOGY REFERENCE NO. 0- 0
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
RIGHT EAR TAG INFECTION

MICROSCOPIC FINDINGS:

MICROSCOPIC EVALUATION NOT REQUIRED

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8755 SEX: FEMALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 203.000 GRAMS

PATHOLOGY REFERENCE NO. 81-C4111
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

OVARIES
PLACED IN JAR OF FORMULA FOR 13 MINUTES, FOUND, OVARIES LOST BETWEEN COLLECTION AND WEIGHING

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MODERATE)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE
OVARIES
TISSUE EXAMINED, NO LESIONS FOUND

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8756 SEX: FEMALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 272.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04112
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MODERATE)
LEFT EYE
PERIORBITAL REGION
INFLAMMATION, NOS
(MODERATE)
KIDNEYS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE
CORPUS UTERI
DILATATION, NOS

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8757 SEX: FEMALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 257.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04113
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MODERATE)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8758 SEX: FEMALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 216.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04114
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MODERATE)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8759 SEX: FEMALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 229.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04115
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
PITUITARY
CYST, NOS
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

TISSUE(S) MISSING OR SEVERELY AUTOLYZED:

MAMMARY GLAND
SECTION AND/OR TISSUE NOT PRESENT

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8760 SEX: FEMALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 252.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04116
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
RIGHT EAR THICKENED
KIDNEYS
WHITE GRITTY MATERIAL IN LEFT KIDNEY, DILATED PELVIS

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MILD)
KIDNEYS
HYDRONEPHROSIS
(MILD)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8761 SEX: FEMALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-23-81
TERMINAL WEIGHT: 253.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04117
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MODERATE)
MESENTERIC LYMPH NODE
INFLAMMATION, GRANULOMATOUS
(MODERATE)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

TISSUE(S) MISSING OR SEVERELY AUTOLYZED:

MAMMARY GLAND
SECTION AND/OR TISSUE NOT PRESENT

COMMENTS:

SMALL SCABS ON TAIL NOT APPARENT AT NECROPSY

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8762 SEX: FEMALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 245.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04118
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
SPLEEN
HEMATOPOIESIS (EXTRAMEDULLARY)
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE
KIDNEYS
KIDNEY/PELVIS
MINERALIZATION
(MODERATE)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8763 SEX: FEMALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 238.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04119
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8764 SEX: FEMALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 251.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04120
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

GENERAL APPEARANCE AT NECROPSY
RIGHT EARTAG INFECTION

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8765 SEX: FEMALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 199.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04121
SPECIES: RATS
STRAIN: CDBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MINIMAL)
KIDNEYS
KIDNEY/PELVIS
INFLAMMATION, NOS
(MODERATE)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8766 SEX: FEMALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 262.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04122
SPECIES: RATS
STRAIN: CDBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8767 SEX: FEMALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-22-81
TERMINAL WEIGHT: 211.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04123
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

LIVER
LIVER/CENTRILOBULAR
BASOPHILIC STIPPLING
(MILD)
STOMACH
INFLAMMATION, NOS
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8768 SEX: FEMALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 209.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04124
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
PITUITARY
CYST, NOS
SPLEEN
HEMOSIDEROSIS
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8769 SEX: FEMALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 230.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04125
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

THYROID
REDUCED

MICROSCOPIC FINDINGS:

LIVER
INFLAMMATION, FOCAL
(MILD)
STOMACH
INFLAMMATION, NOS
(MILD)
THYROID
TISSUE EXAMINED, NO LESIONS FOUND
SPLEEN
HEMOSIDEROSIS
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8770 SEX: FEMALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 255.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04126
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
SPLEEN
HEMOSIDEROSIS
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8771 SEX: FEMALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 249.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04127
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

HEART
DEGENERATION, NOS
(MINIMAL)
STOMACH
INFLAMMATION, NOS
(MILD)
SPLEEN
HEMOSIDEROSIS
(MILD)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8772 SEX: FEMALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 236.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04128
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
SPLEEN
HEMOSIDEROSIS
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE
BLOOD VESSEL
FOCAL
MINERALIZATION
(MILD)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8773 SEX: FEMALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 211.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04129
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MILD)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE
KIDNEYS
FOCAL
INFLAMMATION, INTERSTITIAL
(MILD)

LITTON BIONETICS, INC.
PROJECT NO. 10734-15 INDIVIDUAL ANIMAL EVALUATION

ANIMAL NO. 8774 SEX: FEMALE
GROUP 4 - HIGH DOSE
DOSE AMOUNT: 3000 PPM
WEEKS ON STUDY: 13
DATE OF DEATH: 01-21-81
TERMINAL WEIGHT: 285.000 GRAMS

PATHOLOGY REFERENCE NO. 81-04130
SPECIES: RATS
STRAIN: COBS CD(SD) BR
SOURCE: CHARLES RIVER (PORTAGE)
TYPE OF DEATH: TERMINAL KILL
METHOD OF KILL: CARBON DIOXIDE

GROSS OBSERVATIONS:

ANIMAL APPEARED NORMAL GROSSLY

MICROSCOPIC FINDINGS:

STOMACH
INFLAMMATION, NOS
(MODERATE)
CECUM
INFLAMMATION, NOS
(MILD)
RECTUS FEMORIS MUSCLE
MULTIFOCAL
DEGENERATION, NOS
(MINIMAL)
LUNGS
BLOOD VESSEL
LYMPHOCYTIC INFLAMMATORY INFILTRATE
KIDNEYS
KIDNEY/PELVIS
MINERALIZATION
(MILD)
KIDNEY/PELVIS
INFLAMMATION, ACUTE
(MILD)

SECTION H

APPENDIX C

DETERMINATION OF ISOPROPYL METHYLPHOSPHONIC ACID (IMPA) IN EXPERIMENTAL ANIMAL DRINKING WATER FORMULATIONS: CHEMICAL METHODS AND RESULTS

FINAL CHEMISTRY REPORT

SUBMITTED TO:

ENVIRONMENTAL PROTECTION DEPARTMENT
U.S. ARMY MEDICAL BIOENGINEERING
RESEARCH AND DEVELOPMENT LABORATORY
FORT DETRICK, FREDERICK, MD. 21071
ATTENTION: SGRD-UBG

CONTRACT NO.: DAMD-17-77-7003

SUBMITTED BY:

DEPARTMENT OF CHEMISTRY
LITTON BIONETICS, INC.
5516 NICHOLSON LANE
KENSINGTON, MD 20795

AUGUST 10, 1981

SPONSOR: Environmental Protection Department
U.S. Army Medical Bioengineering Research and Development Laboratory

MATERIAL: Isopropyl Methylphosphonic Acid (IMPA) Sodium Salt
LBI #3427 and 6488

SUBJECT: CHEMISTRY FINAL REPORT
Determination of IMPA in Experimental Animal Drinking Water Formulations
LBI Project No. 10734

SUMMARY

Chemical analyses of the dosed drinking water prepared for toxicological testing were performed to determine dose concentration and stability of the chemical. The analytical method used was that implemented by Litton Bionetics, Inc. following a review meeting with representatives of the sponsor; the method involves formation of a volatile derivative using diazomethane. The method used is a modification of a method contributed by the Sponsor's research and development laboratory.

The dose verification analyses of the drinking water formulations showed that for the most part, the formulations were near intended concentrations. Six preparations yielded results lower than the pre-study limit (85% of target). The study director was informed in each instance of low assay results. A copy of the analytical method, and a discussion of the sensitivity and accuracy of the method is included.

SPONSOR: Environmental Protection Department
U.S. Army Medical Bioengineering Research and Development Laboratory

MATERIAL: Isopropyl Methylphosphonic Acid (IMPA) Sodium Salt
LBI #3427 and 6488

SUBJECT: CHEMISTRY FINAL REPORT
Determination of IMPA in Experimental Animal Drinking Water Formulations
LBI Project No. 10734

1. OBJECTIVE

The purpose of the chemistry study was to analyze the drinking water formulations used in toxicological testing. The aqueous preparation was also tested for stability.

2. EXPERIMENTAL METHODS AND PROCEDURES

A. Methods

Attempts were made to develop a method for the analysis of IMPA added to animal feed, but these were unsuccessful. This work is summarized in Chemistry attachment A of this section. The route of administration was changed from dosed feed to drinking water, with the sponsor's approval.

Analyses of the drinking water formulations were performed by acidifying an aliquot of the water and diluting it with methanol. A small volume of the diluted sample was then treated with an ether solution of diazomethane to form the methyl ester of IMPA. The volatile ester was then analyzed by gas chromatography using a flame photometric detector with a phosphorus-specific filter. The internal standard used for the gas chromatography was triethyl phosphate. A detailed version of the analytical method is presented in attachment B of this section.

B. Procedures

Homogeneity testing of the formulations was not considered necessary since solutions, by definition, are homogeneous.

Stability of the chemical in the acidified drinking water at ambient temperatures was determined by analysis of single subsamples of formulations taken from the carboys at time of formulation, and again at the end of time use for dosing animals.

The results of these two sets of analyses are listed in Table 1.

B. Procedures (Continued)

Dose verification analysis of the drinking water was originally scheduled for the first three formulations and, if no problems in formulation were detected, for every third formulation thereafter.

However, indications of consistently low formulation were found for the second and third sets of preparations, so the Chemistry Department advised the Study Director to authorize analysis of the fourth formulation (see Table 2). When analysis of the mix of 12/02/80 showed consistently low formulation (74.6 to 79.0% of intended concentration), it was decided to assay the two remaining sets of formulations, so that results for all six batches would be available. A complete summary of results of dose verifications is given in Table 2.

3. RESULTS AND CONCLUSIONS

The analytical data for testing the stability of sodium isopropyl methyl phosphonate in water shows some decrease in the test compound concentration at the two higher doses after room temperature storage for a total of 25 days. Since new formulations were mixed about every 14 days, the stability of the test compound in the drinking water appears adequate for the time of use for dosing. Twelve of the formulation were within limits of ±15% of intended concentration. However, the IMPA concentration of six of the drinking water formulations was below -15% of target.

Some individual assay values may be unreliable because the flame photometric (phosphorous-specific) detector requires very stable flow rates of hydrogen, air and oxygen for a constant sensitivity to be achieved. The detector was serviced by an authorized instrument company service person; other than an insensitivity of the photomultiplier tube, no problems were found in the operation of the device. It was necessary, throughout the study, to operate the detector at or near its most sensitive setting. This operation introduced considerable noise into the baseline, which in turn caused variations in the integration of the peak areas for the methyl ester of IMPA and for the internal standard.

The precision of the method proved to be poorer than first found when the written method (attachment B) was prepared. For this reason, average results of duplicate assays are given in Tables 1 and 2 and analyses with exceptionally poor precision (which had to be included due to limted sample size) are footnoted.

Despite the possibility of some analytical error introduced by baseline noise problems, the overall results given in Table 2 show that at all dose levels, average concentrations of IMPA found were near intended levels. For the 300 ppm target level, the grand mean of

the % of target results (n=6) in Table 2 is 87.0%. The corresponding standard deviation for all formulations is ±7.7%. For the 1000 ppm target level, the grand mean (n=6) is 93.0% of target, with a standard deviation of ±8.7%. For the 3000 ppm formulation, the grand mean (n=6) is 91.9% of target with a standard deviation of ±15.9%. This means experimental animals were dosed at around 90% of the intended concentration over the time span of the study.

Summary report prepared by:

Lynn S. Reed

Lynn S. Reed, Ph.D.
Head, GC/MS Section

11/10/81
Date

Revision of 8/11/81 prepared by:

Jerry M. Fitzgerald

Jerry M. Fitzgerald, Ph.D.
Head, Analytical Chemistry Section

11/9/81
Date

Approved by:

V. Frank Boyd

V. Frank Boyd, Ph.D.
Director, Dept. of Chemistry

11-9-81
Date

SECTION H
APPENDIX C

CHEMISTRY ATTACHMENT A

METHOD DEVELOPMENT FOR THE ANALYSIS OF
IMPA SODIUM SALT IN FEED

METHOD DEVELOPMENT FOR THE ANALYSIS OF NaIMPA IN FEED

The experimental design consisted of the following:

1. Extract IMPA from feed
2. Separate IMPA from interferences (from feed) by chromatography
3. Detect and quantitate IMPA present

Analytical problems were found in all three areas.

1. EXTRACTION

The sodium salt of IMPA was found to dissolve only in water and methanol (July 1979). Other solvents tried were tetrahydrofuran, acetonitrile, pyridine, dimethylformamide, dimethyl sulfoxide, acetone and ethyl acetate. Extraction of an acidified aqueous solution of NaIMPA with n-butanol gave a recovery of 20%.

2. CHROMATOGRAPHY

A. Derivatization

An attempt was made to reproduce the method developed by SRI, involving ion exchange chromatography, lyophilization, and formation of the methyl ester of IMPA. The recovery was 0.4%. Concurrently, several other derivatization methods were tried, including ion pair extraction and alkylation (ref: 1976, Aldrichemica Acta, 9:35; 1971, Acta Pharm. Sueica, 8:113) solid-liquid phase transfer reaction (ref: Ludurkow, Metal, 1978, Angero Chem. Inst. Ed., 17(1):62; Van Heerden, F.R., et al., 1978, Tetrahedron Letters #7, 661), crown ether catalyzed alkylation (ref: Davis, B., 1977, Anal. Chem., 832). Attempts were made to form esters using methylating and silylating agents as well as dibromoacetophenone and pentafluorobenzyl bromide (PFB). Many of these reagents can be used successfully with the free acid, but the sodium salt is more resistant to esterification. An identifiable product was formed from the crown ether catalyzed reaction of PFB and a solution of NaIMPA. However, this derivative is not stable. IMPA dosed feeds gave method recoveries ranging from 87 to 43% (August 1979) and from 62 to 10% (August 1980).

B. Gas Chromatography

Derivatives made with the free acid were found to tail badly on the original SRI GC column. A more suitable stationary phase was found by testing several possibilities.

3. DETECTION AND QUANTITATION

A phosphorus specific (flame photometric) detector was used for the gas chromatographic analysis. There was adequate sensitivity and specificity for the pentafluorobenzyl derivative of IMPA using this detector. However, the excess derivatizing agent or its combustion products collected on the detector exhaust port - and possibly on the optical filter as well - causing flow restrictions which might alter the response of or damage the detector. The possibility of developing an HPLC method utilizing ultraviolet detection was examined but not considered feasible because of the difficulty of derivatizing IMPA and because of the high background UV absorbance usually seen for feed extracts.

After meeting with the sponsors, it was decided that the route of administration would be changed from feed to drinking water (August 1980). An adequate method for the analysis of NaIMPA in drinking water was then developed and implemented.

SECTION H
APPENDIX C

CHEMISTRY ATTACHMENT B

METHOD FOR DETERMINATION OF IMPA
SODIUM SALT IN DRINKING WATER

DETERMINATION OF IMPA MONOSODIUM SALT IN DRINKING WATER

1. PRINCIPLE

An aliquot of the water sample is acidified and diluted with methanol. A small volume of the dilution is treated with ethereal diazomethane to form the methyl ester of IMPA, which is analyzed by gas chromatography using a flame photometric detector with a phosphorus filter. Triethyl phosphate serves as the internal standard.

2. REAGENTS

Deionized or distilled water

Potassium hydroxide - reagent grade

Diethyl ether - Burdick and Jackson, grade suitable for pesticide analysis

N-methyl-N´-nitro-N-nitrosoguanidine (MNNG) - Aldrich Chemical Co., Cat. No. 12994-1

Isopropyl methylphosphonic acid (IMPA) reference standard - LBI #6362, supplied by U.S. Army Medical Bioengineering Research and Development Laboratory, (Dr. Clarence W.R. Wade, research chemist).

Triethyl phosphate (TEP) internal standard - Aldrich Chemical Co., Cat. No. T6,110-7

Methanol - Burdick and Jackson, grade suitable for pesticide analysis

Hydrochloric acid, concentrated - reagent grade

3. MATERIALS AND SUPPLIES

Analytical balance accurate to 0.01 mg

Top-loading balance accurate to 0.01 g

Erlenmeyer flask, 125 ml size, with cork stopper

Graduated cylinder: 100 ml size

Volumetric flasks: 10, 25, 50, 100, 200 and 1000 ml sizes

Volumetric pipettes: 1, 4, 5, 10, 15, 20, 25 and 50 ml sizes

Graduated pipettes: 5 and 10 ml sizes

Micropipettor, 200 µl size - SMI (Scientific Manufacturing Industries) or equivalent (positive displacement).

3. MATERIALS AND SUPPLIES (Continued)

Hewlett-Packard Model 5840 gas chromatograph, microprocessor controlled, with flame photometric detector (phosphorus filter), Model 7672A autosampler and associated data system.

Chromatographic column - 1.8 m x 2 mm I.D. silanized glass packed with 10% FFAP on 80/100 mesh Supelcoport.

Autosampler vials, 1 ml capacity (Wheaton Scientific, Millville, NJ 08332, Stock No. 223682) with Teflon-lined aluminum caps (Stock No. 224211).

Crimper for above vials (Wheaton Stock No. 224301).

4. PREPARATION OF ETHEREAL DIAZOMETHANE

Weigh, to nearest 0.01 g, 4 g of KOH into 125 ml Erlenmeyer flask. Dissolve in 10 ml water.

Cool in ice/water bath and add 60 ml diethyl ether.

Weigh, to nearest 0.01 g, 0.75 g of MNNG. Add in small increments to Erlenmeyer flask in ice bath, swirling frequently and capping with cork stopper between additions.

After all MNNG has been added, stopper and let stand one hour. When not being used, store in freezer. (It is not necessary to separate the ethereal solution of diazomethane from the lower aqueous layer).

NOTE: Successful generation of diazomethane imparts an intense yellow color to the ether phase. If this color is not observed, the MNNG may have decomposed.

CAUTION: Diazomethane can undergo explosive polymerization. Never use old, etched glassware or glass-stoppered glassware for its preparation.

5. PREPARATION OF CALIBRATION STANDARDS (Unless otherwise noted, use volumetric glassware for all preparations)

a. Stock Internal Standard Solution (Target: 6 mg/ml)

Weigh, to nearest 0.01 g, 0.6 g of TEP into 100 ml flask. Dissolve in and dilute to volume with methanol.

5. PREPARATION OF CALIBRATION STANDARDS (Continued)

b. Working Internal Standard Solution (IS) (Target: 6 ppm)

Dilute 1.0 ml of stock solution, above, to 1000 ml with methanol.

c. Stock IMPA Standard Solution (Target: 2 mg/ml)

Weigh, to nearest 0.01 mg, 100 mg of IMPA reference standard into 50 ml flask. Dissolve in and dilute to volume with methanol.

d. Intermediate IMPA Standard Solution (Target: 100 ppm)

Dilute 5.0 ml of stock solution, above, to 100 ml with methanol.

e. Stock Methylated IMPA Standard Solution (Target: 40 ppm as IMPA)

Transfer 4.0 ml intermediate solution, above, to 10.0 ml flask. Add 3 ml (graduated pipette) ethereal diazomethane. (More diazomethane solution may be added as necessary to obtain a persistent yellow color). Swirl to mix, stopper and let stand one hour. Dilute to volume with methanol.

f. Working Methylated IMPA Standard Solution (Target: 2 ppm)

Dilute 5.0 ml stock methylated solution, above, to 100 ml with methanol.

g. Chromatographic Calibration Standards

Combine aliquots of working methylated IMPA and working IS standard solutions indicated below to 100 ml with methanol:

Working Methylated IMPA Standard ml	Working IS Standard ml	Final IMPA Target Concentration ppm
5.0	20.0	0.100
10.0	20.0	0.200
25.0	20.0	0.500
50.0	20.0	1.00

6. PREPARATION OF SAMPLES FOR ANALYSIS

NOTE: (Although the test material is the monosodium salt of IMPA, the concentrations of dosage formulations are expressed in terms of the free acid).

6. PREPARATION OF SAMPLES FOR ANALYSIS (Continued)

(Unless noted otherwise, use volumetric glassware for all preparations).

Transfer aliquots of sample solutions as indicated below to 200 ml flasks. Add 4 ml (graduated pipette) of concentrated HCl and dilute to volume with methanol. Mix well. (Since dilution of water with methanol results in contraction of volume, it will be necessary to add additional methanol to the mark; mix well again.)

Dose or Treatment Level ppm	Aliquot Taken For Dilution ml	Target IMPA Concentration in Dilution ppm
0	50.0	0
300	50.0	75
1000	15.0	75
3000	5.0	75

With micropipettor, transfer duplicate 200 µl aliquots of each diluted sample to 25.0 ml flasks. Add 4 ml (graduated pipette) ethereal diazomethane. (More diazomethane solution may be added as necessary to obtain a persistent yellow color.) Swirl to mix, stopper and let stand one hour. Add 5.0 ml internal standard solution and dilute to volume with methanol.

7. GAS CHROMATOGRAPHIC ANALYSIS

Transfer aliquots of calibration standards and methylated samples to autosampler vials and cap closed. Load autosampler, beginning and ending run with a complete set of chromatographic standards. Since "ghost" peaks have been observed in solvent injections following standard injections, it would be advisable to place two or three solvent "samples" in the autosampler after the first set of standards to clear the system of residual IMPA and TEP.

Suggested chromatographic parameters: (May be modified to obtain approximate retention times given below.)

TEMP 1	125°C
TIME 1	0.00 min
INJ TEMP	225°C
AUX TEMP	245°C
CHT SPD	0.50 cm/min
ZERO	10.0
ATTN 2↑	2
AUX SGNL	A*
SLP SENS	0.05

*Column connected from injector B to FPD.

7. GAS CHROMATOGRAPHIC ANALYSIS (Continued)

AREA REJ	10000000
FLOW B	30.0 ml/min
1.00 AREA REJ	0
1.50 IFN	9
7.00 STOP	
Hydrogen :	200 rotometer units (24 psig)
Air :	50 rotometer units (24 psig)
Oxygen :	20 rotometer units (24 psig)

Check chromatographic performance with a 3 µl injection of the highest standard (1.00 ppm). Retention times of IMPA and the internal standard should be approximately 2.7 and 5.0 minutes, respectively.

Enter the options as indicated below. Set the "Change Run" at 0 and the "Stop Run" to correspond to the number of analyses, including the number of solvent injections to clear the "ghost" peaks.

OPTN #
1. ID: 10734-15
2. DATE: (Current)
   TIME: (Current)
3. INJ/BTL, STROKE: 1,2 (approximately 3 µl injection)
4. EXT ALARM AMT
5. DIL FACTOR: 1.0000 E+ 0
6. RF UNC PKS: 0.0000 E+ 0
7. RPRT UNC PEAKS (NO)
8. TRANSMIT RPRT (NO)
9. SUPPRESS RPRT (NO)

Press "Start Run" to initiate analysis.

8. CALCULATIONS

For standards and samples alike, calculate the area ratio, IMPA/TEP, using the area responses obtained by gas chromatographic analysis.

Using linear regression analysis, establish a calibration curve relating ppm of the GLC standards to their respective area ratios. The analytical run will be considered acceptable based on a correlation coefficient of at least 0.99. (Criteria for slope and intercept cannot be established because they depend upon the relative amounts of IMPA and TEP in the standards.)

8. CALCULATIONS (Continued)

Based on the calibration curve and the area ratios of the samples, calculate the concentration (ppm) of IMPA in the methylated sample solutions analyzed.

Calculate the concentration of IMPA in the dosage formulation from this formula:

$$\text{ppm IMPA} = C \times \frac{V_4}{V_3} \times \frac{V_2}{V_1}$$

where C = concentration of IMPA in methylated solution analyzed (ppm)
V_1 = aliquot of dosage formulation taken for analysis (ml).
V_2 = volume to which V_1 was diluted (200 ml).
V_3 = volume of dilution taken for methylation (0.200 ml)
V_4 = final volume of methylated solution (25.0 ml)

Since V_2, V_3 and V_4 are constants, the expression reduces to:

$$\text{ppm IMPA in dosage formulation} = \frac{C}{V_1} \times 25{,}000$$

Replication Check (Precision):

For any given concentration of IMPA, calculate:

$$\% \text{ agreement} = \frac{(\text{Result for subsample A} - \text{Result for subsample B}) \times 100}{\text{Mean result of two subsamples}}$$

$$= \quad 10\% \text{ or smaller*}$$

*Note added at end of study. In some isolated analyses, agreement between duplicates was worse than 10%. Results were included in this report if no more sample was available for reanalysis.

Calculate percent of target concentration for each dosage formulation:

$$\% \text{ of target} = \frac{\text{Mean assay value of IMPA} \times 100\%}{\text{Target concentration of IMPA}}$$

Method developed by:

Harold J. Paulin, M.S.

Approved for use by:

Jerry M. Fitzgerald, Ph.D.

8/12/81
Date

LITTON BIONETICS, INC.
PROJECT NO. 10734-15
IMPA

TABLE 1

STABILITY ANALYSIS OF IMPA SODIUM SALT IN DRINKING WATER FORMULATIONS

SAMPLE NUMBER	DATE MIXED	DATE SAMPLED	DATE ANALYZED	TARGET LEVEL (ppm)	FOUND (ppm)	% OF TARGET	% OF ORIGINAL ANALYSIS VALUE
R06450K80	12/15/80	12/15/80	12/18/80	300	253*	84.3*	NA
R06451K80	12/15/80	12/15/80	12/18/80	1000	918	91.8	NA
R06452K80	12/15/80	12/15/80	12/18/80	3000	3410	114	NA
R06753K80	12/15/80	12/29/80	01/13/80	300	259	86.3	102
R06754K80	12/15/80	12/29/80	01/13/80	1000	683	68.3	74
R06755K80	12/15/80	12/29/80	01/13/80	3000	2729	91.0	80

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*Replication of values for duplicate samples at this level was poor. Insufficient sample for further analyses.

LITTON BIONETICS, INC.
PROJECT NO. 10734-15
IMPA

TABLE 2

FORMULATION VERIFICATION OF IMPA SODIUM SALT IN WATER

SAMPLE NUMBER	DATE MIXED	DATE ANALYZED	TARGET LEVEL (ppm)	FOUND (ppm)	% OF TARGET
RO5439K80	10/22/80	10/24/80	300	294	98.0
RO5440K80	10/22/80	10/24/80	1000	1054	105
RO5441K80	10/22/80	10/24/80	3000	3066	102
RO5524K80	10/27/80	10/31/80	300	256	85.3
RO5525K80	10/27/80	10/31/80	1000	988	98.8
RO5526K80	10/27/80	10/31/80	3000	2220	74.0
RO5720K80	11/04/80	11/06/80	300	249	83.0
RO5721K80	11/04/80	11/06/80	1000	909	90.9
RO5722K80	11/04/80	11/06/80	3000	2639	88.0
RO6255K80	12/02/80	12/04/80	300	232	77.3
RO6256K80	12/02/80	12/04/80	1000	790	79.0
RO6257K80	12/02/80	12/04/80	3000	2238	74.6
RO6450K80	12/15/80	12/18/80	300	253*	84.3
RO6451K80	12/15/80	12/18/80	1000	918	91.8
RO6452K80	12/15/80	12/18/80	3000	3410	114
RO6684K80	12/30/80	01/08/81	300	283	94.3
RO6685K80	12/30/80	01/08/81	1000	923	92.3
RO6686K80	12/30/80	01/08/81	3000	2959	98.6

*Insufficient sample for rederivatization and reanalysis; extremely poor replication. Average value listed here.

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