8. N-EtFOSE alcohol	N-ethyl perfluorooctane sulfonamidoethanol

Acute Toxicity

1) Corrected Final Report, Acute Inhalation Toxicity Study in Rats, 3M Reference No. T-2991IT, Hazelton Laboratories America, Inc., Study No. 154-157, February 2, 1981

Genotoxicity

1) Final Report, Mutagenicity Test on T-5710 in an *In Vivo* Rat Micronucleus Assay, Hazelton Washington, Inc., Study No. 15516-0-454, April 23, 1993

2) Final Report, Genotoxicity Test on T-5710.1 in the In Vivo/In Vitro Unscheduled DNA Synthesis and Cell Proliferation in Rat Liver Cells, Hazelton Washington, Inc., Study No. 15516-0-494, September 14, 1993

3) Final Report, Mutagenicity Test on T-6292 in an *In Vivo* Mouse Micronucleus Assay, Hazelton Washington, Inc., Study No. 17384-0-455, May 2, 1996, with Protocol and Protocol amendments

4) Evaluation of the Mutagenic Activity of T-6906 in an In Vitro Mammalian Cell Gene Mutation Test with L5178Y Mouse Lymphoma Cells, NOTOX Study No. 223458, 3M Reference No. FM-3923

   a) Final Report, December 22, 1998 (see letter below)

   b) Letter from Steve R. Haworth, Ph.D., Covance Laboratories, reviewing the NOTOX study and concluding it was technically inadequate and should be repeated
   Note: 3M is repeating the study

Repeated-Dose Toxicity

1) Final Report, Ninety Day Subacute Rat Toxicity Study on FM-3422, International Research and Development Corporation, Study No. 137-086, November 10, 1978

2) Final Report, Ninety Day Subacute Rhesus Monkey Toxicity Study, on FM-3422, International Research and Development Corporation, Study No. 137-088, January 16, 1979

3) Two-Year Dietary Study

   a) Report, Volumes 1-5, Two Year Oral (Diet) Toxicity / Carcinogenicity Study of Fluorochemical FM-3924 in Rats, Riker Laboratories, Inc., Study No. 0281CR0012, August 29, 1987, Conducted during April 1981 - May 1983

   b) Report Amendment No. 1, Two Year Oral (Diet) Toxicity / Carcinogenicity Study of Fluorochemical FM-3924 in Rats, Riker Laboratories, Inc., Study No. 0281CR0012, October 25, 1988

   c) Xenos Letter dated May 24, 1991 with attachment: 3M Response to FDA Letter of December 10, 1990 [re 2 year cancer study], Food Additive Petition Nos. 0B4197 and 0B4206

   d) Pathology Review of Reported Tumorigenesis in a Two Year Study of FM-3924 in Rats, Pathology Associates International, November 25, 1998

   e) Analytical on retained sample

   f) Review by Dr. William H. Butler of Two Year (Diet) Toxicity / Carcinogenicity Study of Fluorochemical FM 3924 in Rats

4) Ongoing 2-Year Study

   a) Summary Report of Week 53, 104-Week Dietary Carcinogenicity Study with Narrow Range (98.1%) N-Ethyl Perfluorooctanesulfanoamido Ethanol in Rats, 3M Reference No. T-6316.1, Covance Laboratories, 6329-212 and –228 (draft final report expected fall 2000)

Pharmacokinetic Studies

1) Synthesis and Characterization of N-Ethyl FOSE ^{14}C, Riker Laboratories, March 17, 1981

2) Final Report, Absorption and Biotransformation of N-Ethyl FOSE and Tissue Distribution and Elimination of Carbon-14 after Administration of N-Ethyl FOSE - ^{14}C in Feed, Riker Laboratories, Inc., January 19, 1983

Attachments to Letter to C. Auer dated May 18, 2000
Studies and Other Information on Certain
Perfluorooctane Sulfonate-Related Compounds

Previously submitted with May 4, 2000 letter -- Qualitative Investigation of the In Vitro Metabolism of T-6292 (n-ethyl FOSE), T-6293 (n-ethyl FOSE phosphate diammonium salt(ester)), T-6294 (n-ethyl perfluorooctane sulfonamide) and T-6295 (perflurooctane sulfonate) by Rat and Human Hepatocytes Using Ion Spray LC/MS and LC/MS/MS, Advanced Bioanalytical Services, Inc., [Preliminary] Analytical Report, Report 96ADEM01.3M, November 12, 1996

Previously submitted with May 4, 2000 letter - Advanced Bioanalytical Services, Inc., Analytical Report, Additional Characterization of Metabolites of T-6292, T-6293 and T-6294 from Rat and Human Hepatocytes by TurboIonSpray LC/MS and LC/MS/MS. Semi-Quantitative Analysis of T-6295 in Rat and Human Hepatocytes Incubated with T-6292, T-6293 and T-6294 by LC/MS/MS, January 28, 1998, Report 98AGKP01.3M

Mechanistic

1) Final Report, Analysis of T-5877 in a Cell Proliferation Assay in Rat Liver Cells, Hazelton Washington, Inc., Study No. 154-208, 3M Reference T-5877 (wide range ethyl FOSE), FM-3924, Lot 547, L-13202, November 1, 1994, with Protocol and Protocol Addendum, Key to FC Alcohol Tox Samples (including 5877), and Analytical data

Teratology

1) Oral (Gavage) Developmental Toxicity Study of N-EtFOSE in Rats

   a) Final Report, Oral (Gavage) Developmental Toxicity Study of N-EtFOSE in Rats, 3M Reference No. T-6316.7, December 17, 1998

   b) Summary N-Etfose Rat Teratology, Oral (Gavage) Developmental Toxicity Study of N-EtFOSE in Rats, 3M Reference No. T-6316.7

2) Oral (Stomach Tube) Developmental Toxicity Study of N-EtFOSE in Rabbits

   a) Final Report, Oral (Stomach Tube) Developmental Toxicity Study of N-EtFOSE in Rabbits, 3M Reference No. T-6316.8, January 11, 1999

   b) Summary N-EtFOSE Rabbit Teratology, Oral (Stomach Tube) Developmental Toxicity Study of N-EtFOSE in Rabbits, 3M Reference No. T-6316.8

3) Teratology Studies of T-2999 (FM-3924) in Rabbits

a) Final Report, Oral Rangefinder Study of T-2999CoC in Pregnant Rabbits, Safety Evaluation Laboratory, Riker Laboratories, Inc., Study No. 0680RB0019, June 25, 1981

b) Final Report and Protocol, Oral Teratology Study of T-2999CoC in Rabbits, Safety Evaluation Laboratory, Riker Laboratories, Inc., Study No. 0681TB0212, 3M Reference No. FM 3924 (88% ethyl FOSE), January 7, 1982

c) 3M Internal Correspondence re alcohols being used in Riker studies, from DR Ricker to WC McCormick, dated December 10, 1980

d) Analytical Analyses of Suspension of FM-3924, Internal Memo, from TR Mathisen to EG Gortner, dated April 8, 1981

e) 3M Internal Correspondence, Analytical Evaluation of FM-3924, dated June 22, 1982

4) Oral Teratology Study of FM-3422 in Rats

a) Final Report, Oral Teratology Study of FM-3422 in Rats, Safety Evaluation Laboratory, Riker Laboratories, Inc., Study No. 0680TR0010, January 22, 1981

b) 3M Internal Correspondence re alcohols being used in Riker studies, from DR Ricker to WC McCormick, dated December 10, 1980

5) Teratology Studies of T-2999CoC (FM-3924) in Rats

a) Final Report, Special Lens Oral Teratology Study of T-2999CoC in Rats, Safety Evaluation Laboratory, Riker Laboratories, Inc., Study No. 0680TR0020, 3M Reference No. FM-3924, December 22, 1981

b) Final Report and Protocol, Special Lens Oral Teratology Study of T-2999CoC in Two Strains of Rats, Safety Evaluation Laboratory, Riker Laboratories, Inc., Study No. 0681TR0362, July 20, 1982

c) 3M Internal Correspondence re alcohols being used in Riker studies, from DR Ricker to WC McCormick, dated December 10, 1980

d) Analytical Analyses of Suspension of FM-3924, Internal Memo, from TR Mathisen to EG Gortner, dated April 8, 1981

e) 3M internal correspondence re analytical analysis of FM-3924, from EG Gortner to RM Payfer, dated June 22, 1982

6) Memo from EG Lambrecht to Riker Study Files re Fetal Lens Artifact -- Summary of Developments to Date, dated November 6, 1981

Previously submitted to TSCA 8e docket, Final Report, Combined Oral (Gavage) Fertility, Developmental and Perinatal/Postnatal Reproduction Toxicity Study of N-EtFOSE in Rats, 3M Reference No. T-6316.5, June 30, 1999
Note: weight gain effects in F_1 generation currently being reanalyzed. Report may require amendment.

Studies In Progress

1) Protocol, N-EtFOSE Bile Method Development in Rats, 3M Strategic Toxicology Laboratory, Study No. T-6316.15; ST-30, In-Life Start Date August 12, 1999, In-Life End Date August 20, 1999

2) Protocol, Feces Method Development Metabolism Study for Perfluorooctanesulfonate Derivatives [N-EtFOSE, PFOS, and FOSA], 3M Strategic Toxicology Laboratory, Study Nos., T-636.17; T-6295.21; T-7132.3; ST-41, In-Life Start Date November 22, 1999, In-Life End Date November 24, 1999

3) Protocol, Cell Proliferation Study with N-Ethyl Perfluorooctanesulfonamido Ethanol (N-EtFOSE; 3M T-6316.11), Perfluorooctane Sulfonic Acid Potassium Salt (PFOS; 3M T-6295.16), and N-Ethyl Perfluorooctanesulfonamide (PFOSA 3M T-7091.1) in Rats, Pathology Associates International, Study No. 1132-100

Pre-1976 Studies (bibliography only)

1) Final Report, Oral LD 50 (4 levels), 3M Reference No. T-961, WARF Institute, Inc., Study No. 4043911, June 12, 1974

2) Final Report, Acute Vapor Inhalation Toxicity Study in Rats, 3M Reference No. T-1260, Industrial Bio-Test Laboratories, Inc., July 21, 1975

3) Final Report, Acute Vapor Inhalation Toxicity Study in Rats, 3M Reference No. T-1259, Industrial Bio-Test Laboratories, Inc., July 21, 1975

4) Final Report, Skin and Eye Irritation Study, WARF Institute, Inc., Study No. 5060080, 3M Reference No. T-1260, June 17, 1975

5) Final Report, Skin and Eye Irritation Study, WARF Institute, Inc., Study No. 5060079, 3M Reference No. T-1259, June 17, 1975

CORRECTED copy

FINAL REPORT

ACUTE INHALATION TOXICITY STUDY IN RATS

T-2991IT

Submitted to
3M COMPANY
February 2, 1981

HAZLETON
LABORATORIES AMERICA, INC.
9200 LEESBURG TURNPIKE, VIENNA, VIRGINIA 22180, U.S.A.

HAZLETON
LABORATORIES AMERICA, INC.

SPONSOR: 3M COMPANY

DATE: February 2, 1981

MATERIAL: T-2991IT

SUBJECT: FINAL REPORT
Acute Inhalation Toxicity Study in Rats
Project No. 154-157

I. SUMMARY

The test material, T-2291IT, was evaluated for acute inhalation toxicity in rats. Exposure to the test material for four hours at a nominal concentration of 6.57 mg/liter caused sniffing and preening. After 60 minutes of pressure, all animals appeared normal and remained so until the end of the study. Most exposed animals lost weight by post-exposure Day 1, but subsequently recovered. All animals gained weight by the end of the study. Gross pathology findings at necropsy revealed a higher incidence of lung lesions in exposed males, but there were no consistent findings indicative of a compound-related effect. Microscopic examination of fixed lungs, livers, kidneys and all grossly abnormal tissues also failed to reveal compound-related histomorphologic changes.

II. OBJECTIVE

The purpose of this study was to assess the acute inhalation toxicity in rats to a single 4-hour exposure to T-2991IT in conformance with proposed FIFRA guidelines (40 CFR Section 163.81-3, August 22, 1978). The study was initiated November 25, 1980, and terminated December 10, 1980.

HAZLETON
LABORATORIES AMERICA, INC.

III. MATERIALS AND METHODS

A. Test Material

The test material, T-2991IT, a yellow liquid, was received November 19, 1980, and stored at room temperature. Information on the methods of synthesis, stability, as well as data on composition or other characteristics which define the test material are on file with the sponsor.

B. Animals and Animal Care*

A total of 20 healthy appearing rats, equally divided by sex, of the Sprague-Dawley descended strain, obtained from Charles River Breeding Laboratories, Inc., Wilmington, Massachusetts, were selected from a stock pool of 24. Animals not selected for study were returned to the stock pool. The animals ranged in weight from 228 to 335 grams when selected, and had been quarantined for at least 19 days prior to selection. Throughout the study, the animals were individually housed in stainless steel wire-mesh cages with food (Purina® Lab Chow #5001®) and water (via automatic lick valves) available ad libitum except during exposure. A 12/12-hour light/dark cycle (6:00 A.M. to 6:00 P.M.) was maintained by automatic timer throughout the study. The exposure was conducted during the light phase. Rats were used in this study because they have historically been used in safety evaluation studies and are required by FIFRA regulations.

C. Groups

The selected 10 animals per sex were assigned to two equal-sized groups by use of a table of random permutations of 16 (Cochran, W.G., and Cox, G.M., Experimental Designs, 1957) as follows:

* These animals were maintained in animal care facilities fully accredited by the American Association for Accreditation of Laboratory Animal Care.

HAZLETON
LABORATORIES AMERICA, INC.

Group No.	Number/Sex	Treatment Target Nominal Concentration
1	5	Air Control
2	5	5.0 - 5.5 mg/L

D. Exposure Conditions

Group 2 was exposed to T-2991IT aerosol in a 100-liter glass and stainless steel chamber operated dynamically at a constant airflow of 16.7 liters/minute. Group 1 was "exposed" in a chamber to air only. The compound was generated for 240 minutes as an aerosol by use of a Solo Sphere nebulizer at an aspirator setting of 100% and operated at an airflow of 3.5 liters/minute.

The aerosol was introduced into the turret top of the chamber with make-up air at 13.2 liters/minute. The exposure was 4.0 hours in duration (plus 30 minutes to allow for chamber purging).

E. Exposure Monitoring

1. Aerosol Concentration

a. Nominal: The nominal concentration of the exposure was calculated by dividing the total weight of T-2991IT aerosolized by the total volume of air passing through the chamber during aerosol generation.

b. Gravimetric: During exposure to T-2991IT, samples were collected on Gelman Metricel DM-450 filters via a probe extended to the approximate breathing zone of the rats. A sampling rate of 10 liters/minute was used. Four 15-minute samples were drawn, starting at 60, 115, 170, and 225 minutes after exposure initiation. Weight gain on each filter divided by total volume of air sampled (150 liters) was used to calculate each gravimetric concentration.

HAZLETON LABORATORIES AMERICA, INC.

CORRECTED COPY

c. Analytical: The above Gelman DM-450 filters were shipped in sealed glass vials, packed on dry ice in air-tight packages, to the sponsor for determination of the weights of active material collected.

2. Particle Size Distribution: Prior to and twice during exposure, samples were collected with Andersen 4-stage Mini-Sampler cascade impactors in order to determine the aerodynamic particle size (mass) distribution of the nonvolatile component of the aerosol in the chamber at the rat's breathing zone. Samples were obtained starting at 60 and 170 minutes after exposure initiation for 15-minute durations. A sampling rate of 1.4 liters/minute was used. The mass median aerodynamic diameter (MMAD) and geometric standard deviation (σg) of the mass distribution was obtained graphically after converting the dry weight gains on each stage and backup filter to cumulative percentages of total weight collected and plotting these against the stage cutoffs (in microns) on log-normal (probit) paper. Values at the 50th and 84/50th (or 50/16th) percentile were taken as the mass median aerodynamic diameter and geometric standard deviation, respectively.

3. Temperature and Relative Humidity (R.H.): Temperature and R.H. in the control chamber were measured with an Abbeon Model M2A4B temperature and R.H. gauge and recorded every 30 minutes. Temperature and R.H. in the chamber varied from 69°F to 75°F and 45% to 53%, respectively.

F. Biological Observations

1. Toxic Signs: Continuously during exposure and twice daily for 14 days post-exposure, all animals were observed for signs of toxicity, abnormal behavior, or unusual appearance. Noteworthy changes were recorded.

2. Body Weight: All animals were weighed and body weights recorded prior to exposure and on Days 1, 2, 3, 4, 7, and 14 post-exposure and prior to necropsy.

HAZLETON LABORATORIES AMERICA, INC.

CORRECTED copy

G. Necropsy

All animals were killed on Day 15 post-exposure by exsanguination under pentobarbital sodium anesthesia. Complete necropsies were performed and gross pathology recorded. Special attention was paid to the lungs and upper respiratory tract. Lungs, liver, kidneys, and all grossly abnormal tissues were fixed in 10% neutral buffered formalin.

H. Histopathology

Preserved tissues were embedded in Paraplast®, sectioned at 5-6 microns, slide mounted, stained with hematoxylin and eosin, and examined microscopically by a board-certified veterinary pathologist for indications of compound-induced changes.

I. Data Storage

All raw data, specimens, and the final report will be stored in the archives of Hazleton Laboratories America upon acceptance of this final report.

III. RESULTS

A. Aerosol Concentration

1. Nominal Concentration: A total of 26.33 grams of T-29911T aerosol were dispersed into the inhalation chamber with a total air volume of 4008 liters. The nominal concentration was, thus, calculated to be 6.57 mg/liter of air of T-29911T.

2. Gravimetric Concentration: Results of the dry weight gravimetric concentration determinations are shown below in Table 1.

HAZLETON LABORATORIES AMERICA, INC.

CORRECTED 10-5-76

Table 1 - Gravimetric Chamber Concentrations of T-2991IT Aerosol(dry weight).

Sample Initiation (min.)	Weight Collected (mg)	Sample Airflow (L)	Gravimetric Concentration (mg/L)
60	8.89	150	.059
115	9.13	150	.061
170	10.74	150	.072
225	10.86	150	.072

3. Particle Size Distribution: Results of the particle size determinations are shown in Table 2. The majority of the mass collected was in the respirable size range (i.e., less than 5.0 microns).

Table 2 - Particle Size Distribution Data.

Stage No.	Cutoff Size μ	Preliminary Weight Collected mg	Sample No. 1 Weight Collected mg	Sample No. 2 Weight Collected mg
1	>4.7	.18	.03	.05
2	<4.7	.11	.05	.07
3	<3.3	.25	.35	.52
4	<2.1	.26	.15	.32
F	<0.65	.03	.00	.02
Σ		.83	.58	.98
MMAD (μ)		2.6	2.4	2.35
σg		2.00	1.33	1.47

B. Mortality

No animals died during this study.

HAZLETON
LABORATORIES AMERICA, INC.

C. Toxic Signs

1. Group 1 (Air Control): All animals in this group exhibited normal appearance and behavior throughout the study.

2. Group 2 (6.5 mg/L): After one minute of exposure, all animals were observed to be sniffing the air, and after five minutes, all animals were preening. All animals appeared calm and normal after 30 minutes, and all animals appeared normal after 60 minutes and throughout the remainder of the exposure. All animals exhibited normal appearance and behavior throughout the 14-day post-exposure observation period.

D. Body Weights

Individual body weights with group means (±S.D.) are presented in Table 3. Most Group 2 animals lost weight after exposure, but subsequently recovered. All animals gained weight by the end of the study.

E. Gross Pathology

Gross pathology findings at necropsy are presented in Table 4. There was a higher incidence of lesions in the lungs of Group 2 males, but there were no consistent findings indicative of a compound-related effect.

F. Histopathology

Microscopic evaluation revealed lesions of chronic respiratory disease consisting of peribronchial and perivascular lymphoid hyperplasia and focal pneumonitis characterized by focally thickened alveolar walls and a pleocellular inflammatory infiltrate, including alveolar macrophages. These lesions were essentially comparable in incidence and severity between control and treated rats with the exception of the control females, in which lesions were slightly less prominent. Histopathologic incidences are presented in Table 5.

HAZLETON
LABORATORIES AMERICA, INC.

Microgranulomas and minimal nonsuppurative pericholangitis were noted in liver sections. Kidney sections revealed minimal to slight focal interstitial nephritis. Hydrometra was present in uterine sections from three females. Lymphoreticular cell hyperplasia was present in the various lymph nodes examined and was accompanied by congestion and pigment-laden macrophages in the mediastinal lymph node of one control female. Foci of agonal hemorrhage were noted in thymic sections of three rats.

In conclusion, microscopic evaluation of hematoxylin and eosin stained sections of lung, liver, kidney and unusual lesions from control and treated rats from an acute inhalation study with T-1991IT failed to reveal compound-related tissue alteration. Spontaneous disease lesions were essentially comparable in incidence and severity between control and treated rats.

Submitted by: W. B. Coate

WILLIAM B. COATE, Ph.D.
Director
Inhalation Toxicology Department

Table 3 - Body Weights (grams).

Animal No./Sex	Pre	Day 1	Day 2	Day 3	Day 4	Day 7	Day 14
			GROUP 1				
47931♂	321	319	324	331	324	344	382
47932♂	341	341	343	348	348	369	408
47933♂	320	325	323	328	331	344	381
47934♂	322	324	328	334	335	352	386
47935♂	323	323	329	338	340	357	395
Mean	325	326	329	336	336	353	390
±S.D.	8.8	8.5	8.0	7.8	9.1	10.4	11.3
47936♀	271	271	276	273	268	280	286
47937♀	235	238	240	240	236	236	243
47938♀	256	256	256	260	257	260	266
47939♀	283	290	291	291	278	291	286
47940♀	275	280	275	283	279	275	284
Mean	264	267	268	269	264	268	273
±S.D.	18.6	20.5	19.8	20.1	17.8	21.3	18.8
			GROUP 2				
47941♂	336	319	329	337	338	355	382
47942♂	350	336	347	353	354	376	414
47943♂	345	319	333	342	343	362	401
47944♂	350	345	350	358	357	383	423
47945♂	340	328	337	346	342	363	405
Mean	344	329	339	347	347	368	405
±S.D.	6.2	11.2	9.0	8.4	8.2	11.4	15.4
47946♀	248	237	237	241	243	246	254
47947♀	239	233	239	239	238	239	242
47948♀	242	241	242	242	241	244	259
47949♀	249	256	258	256	254	260	270
47950♀	278	265	278	282	270	279	289
Mean	251	246	251	252	249	254	263
±S.D.	15.5	13.6	17.3	18.1	13.1	16.2	17.8

Table 4 - Gross Pathology Findings

OBSERVATIONS	GROUPS 1 ♂	GROUPS 1 ♀	GROUPS 2 ♂	GROUPS 2 ♀
NO GROSS LESIONS	2/5	2/5	1/5	1/5
LYMPH NODES				
Tracheal bronchial:				
appear enlarged	1/5			
Cervical:				
left appears enlarged		1/5		
Mediastinal:				
left appears reddened		1/5		
left appears enlarged and granular				1/5
left appears enlarged			2/5	1/5
right side appears enlarged			1/5	
THYMUS				
purple foci			1/5	
right side reddened		1/5		
left side reddened		1/5		
LUNGS				
All Lobes:				
numerous pale areas	1/5			
scattered white foci on surfaces			1/5	
scattered red areas			1/5	
patchy appearance				1/5
Right Diaphragmatic Lobe:				
dorsal surface has two black foci			1/5	
consolidated linear area that did not perfuse				1/5
Right Apical Lobe:				
did not perfuse			1/5	
Left Lobe:				
anterior tip has dark reddened area surrounded by a pale area			1/5	
Intermediate and Left Lateral Lobes:				
scattered red areas on ventral surfaces			1/5	
CECUM				
Red area, probable injection site			1/5	1/5
KIDNEYS				
Dark cortico - medullary area			1/5	
Dark zone in cortico - medullary area	1/5			1/5
UTERINE HORNS				
Appear distended with clear fluid		1/5		
Appear thickened		1/5		1/5

Table 5

HISTOPATHOLOGY INCIDENCE TABLE

	GROUP 1												GROUP 2											
	Males						Females						Males						Females					
Animal No.	47931	47932	47933	47934	47935		47936	47937	47938	47939	47940		47941	47942	47943	47944	47945		47946	47947	47948	47949	47950	
LUNGS																								
Peribronchial lymphoid hyperplasia	2	2	2	2	2		1	1	1	1	1		2	2	2	2	2		1	2	2	2	2	
Perivascular lymphoid hyperplasia	2	2	2	2	2		1		1				2	2	2	1	2			1	2	2	2	
Pneumonitis (focal)	P	P	P	P	P				P				P	P	P	P	P			P	P	P	P	
Focal Atelectasis																			P					
LIVER																								
Microgranulomas	P	P	P	P					P				P	P			P					P		
Nonsuppurative pericholangitis	1	1	1	1	1		1	1	1	1	1				1	1			1	1	1	1	1	
TRACHEOBRONCHIAL LYMPH NODES																								
Lymphoreticular cell hyperplasia				P																				
KIDNEY			X				X		X	X			X				X		X	X	X	X		
Focal interstitial nephritis	1	1		1	2			1			1			1	1	1							1	
MEDIASTINAL LYMPH NODE																								
Lymphoreticular cell hyperplasia										P			P		P	P				P	P			
Congestion										P														
Pigment laden macrophages										P														
UTERUS																								
Hydrometra								P	P													P		
THYMUS																								
Foci of hemorrhage									P	P						P								

Key: P = Present, N = No Section, A = Autolysis, X = Not Remarkable,
1 = Minimal, 2 = Slight, 3 = Moderate, 4 = Moderately Severe/High,
5 = Severe/High O = Absent

Table 5

HISTOPATHOLOGY INCIDENCE TABLE

	GROUP 1												GROUP 2											
	Males						Females						Males						Females					
Animal No.	47931	47932	47933	47934	47935		47936	47937	47938	47939	47940		47941	47942	47943	47944	47945		47946	47947	47948	47949	47950	
CERVICAL LYMPH NODES																								
Lymphoreticular cell hyperplasia										P														
CECUM													X						X					

Key: P = Present, N = No Section, A = Autolysis, X = Not Remarkable,
1 = Minimal, 2 = Slight, 3 = Moderate, 4 = Moderately Severe/High,
5 = Severe/High O = Absent

HAZLETON
LABORATORIES AMERICA, INC.

PERSONNEL

STUDY DIRECTOR: _____
WILLIAM B. COATE, Ph.D.

REPORT PREPARATION: _____
GREGORY W. FABIAN III, B.S.

PATHOLOGIST: _____
DEBORAH BANAS, D.V.M., M.S.
Diplomate, American College of
Veterinary Pathologists

INHALATION SUPERVISOR: _____
ROBERT J. HARDY

TECHNICIANS: ALLMAN, D. TRAMMEL, HENRY, GRIFFEY, REDDEN, HAND, KIMBLE, K. TRAMMEL, BOWERS, UDY

HAZLETON
LABORATORIES AMERICA, INC.

OFFICE OF QUALITY ASSURANCE

Project Title: Acute Inhalation Toxicity Study in Rats

Project No.: 154-157

Quality Assurance inspections of the study and review of the final report of the above referenced project were conducted according to the standard operating procedures of the Office of Quality Assurance and according to the general requirements of the Good Laboratory Practice regulations that were issued on December 22, 1978, by the Food and Drug Administration for compliance on and after June 20, 1979. Findings from the inspections and final report review were reported to management and to the study director on the following dates:

Inspections/Review	Findings Reported	Inspector/Reviewer
Study - 12/10/80	12/11/80	E. Prins
Final Report - 1/26/81	2/2/81	K. Hogan

Frederick G. Snyder
Manager
Office of Quality Assurance

001266