

FINAL PROJECT REPORT 50-514

*Developmental Toxicity Study of Inhaled
1,1,1-Trichloroethane
in New Zealand White Rabbits*

June 25, 1987

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TITLE: Developmental Toxicity Study of Inhaled
1,1,1-Trichloroethane in New Zealand White Rabbits

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Sponsor: Halogenated Solvents Industry Alliance

ABSTRACT

Timed-pregnant New Zealand white rabbits were exposed to 1,1,1-trichloroethane vapor for six hours/day on gestational days (gd) 6 through 18 at target concentrations of 0, 1000, 3000, or 6000 ppm (mean analytical concentrations of 1017 ± 17.7 , 3122 ± 38.6 and 5906 ± 45.1 ppm for the 1000, 3000 and 6000 ppm groups, respectively). Maternal clinical signs were taken daily, and body weights were measured on gd 0, 6, 9, 12, 15, 19 and 29. At scheduled sacrifice on gd 29, maternal body weight, gravid uterine weight and liver weight were taken, with liver sections and nasal turbinates retained. Ovarian corpora lutea of pregnancy were counted and all uterine implantation sites were identified and recorded: resorptions (early or late), dead fetuses and live fetuses. All live fetuses were examined for external malformations including cleft palate, and variations, and for visceral malformations and variations (including craniofacial alterations); 50% of the fetuses in each litter (intact) were examined for skeletal malformations and variations.

Maternal toxicity was observed at 3000 and 6000 ppm: significant weight gain reduction for the exposure period and gestation period and an apparent reduction in gestational weight gain (corrected for gravid uterine weight). Gestational parameters exhibited no significant changes, including number of corpora lutea, total, nonviable, or viable implantations per litter, sex ratio, pre- or postimplantation loss, and fetal body weights (total, males or females) per litter. There were no significant changes in the incidence of any individual malformations, malformations by category (external, visceral or skeletal), or of total malformations. There were also no treatment-related changes in the incidence of individual variations, variations by category, or of total variations, except for an increased incidence at 6000 ppm of bilateral thirteenth rib (a common fetal variation).

In conclusion, exposure to 1,1,1-trichloroethane vapor by inhalation during organogenesis in New Zealand white rabbits resulted in maternal toxicity at 3000 and 6000 ppm and slight fetotoxicity at 6000 ppm. The "no observable effect level" (NOEL) for maternal toxicity was 1000 ppm and the NOEL for developmental toxicity was 3000 ppm. No embryotoxicity or teratogenicity was observed at any exposure concentration employed.

OBJECTIVES

The objective of this study was to evaluate the developmental toxicity (including teratogenicity) of maternally inhaled 1,1,1-trichloroethane vapor in the pregnant New Zealand white rabbit. The potential of the test chemical to produce maternal toxicity was also determined.

MATERIALS AND METHODS

Generation of Atmospheres and Chamber Parameters

Three 55-gallon containers of 1,1,1-trichloroethane test material (methylchloroform; TCEA; CAS No. 71-55-6; Lot No. TA8 606182, BRRC Sample No. 49-228 A, B and C) was received from the Dow Chemical Company (Freeport, TX) on June 25, 1986. Test material from the original containers was placed in one-gallon glass bottles and blanketed with nitrogen. Mr. W. D. Tasto, Dow Chemical USA, provided purity and stability analyses on the test chemical, conducted both before and after the exposure period. No significant compositional changes occurred while the study progressed; the test material remained 99.9% 1,1,1-trichloroethane throughout the study. The gases for the chromatograph were obtained from Linde Corporation. The nitrogen and hydrogen were Ultra High Purity grade and the air was breathing quality.

A Perkin-Elmer Model 3920B gas chromatograph (GC) equipped with a flame ionization detector was used to monitor the 1,1,1-trichloroethane vapor concentrations in the chambers. The GC column was a 10-foot x 1/8 inch (i.d.) stainless steel column packed with 10% SP-2100 on 80/100 mesh Supelcoport® (Supelco, Inc., Bellefonte, PA). A Spectra-Physics series 4000 central processor, a data interface, and a Perkin-Elmer automatic gas sampling system (station and valve programmer units and a gas sampling valve) were used for the analyses.

Calibration of the gas chromatograph was done with dynamically generated gas standards of 1,1,1-trichloroethane prepared by syringe injection of test material into Tedlar® (DuPont) gas bags. The series of standards encompassed the entire range of vapor concentrations generated in the exposure chambers. A linear calibration curve was obtained when areas (integration counts) were plotted versus the gas equivalent concentrations of the standards. The calibration factor (KF) was calculated as:

$$KF = \frac{\text{AREA}}{\text{CONCENTRATION}}$$

The mean KF for all valid injections of standards was used in subsequent microprocessor calculations. This calibration factor was checked at least once each week during the exposure period and did not require adjustment.

Each chamber atmosphere was analyzed for 1,1,1-trichloroethane approximately once every 25 minutes during each 6-hour exposure. Daily nominal concentrations (an estimated concentration calculated from the amount of test material delivered and the chamber airflow during the exposure period) were also calculated for each chamber.

Liquid 1,1,1-trichloroethane was metered from a piston pump into a heated glass evaporator similar in design as that described by Carpenter *et al.* (1975). The temperature in the evaporator was maintained at the lowest level sufficient to vaporize the liquid (35-64°C). The resultant vapor was carried into the chamber by passage of conditioned air through the evaporator. Chamber atmospheres containing 1,1,1-trichloroethane were filtered before leaving an exhaust stack.

The four chambers in Room 139 employed in this study were rectangular in shape, constructed of glass and stainless steel (Wahmann Manufacturing Company, Timonium, MD), and measured approximately 2.1 m x 1 m x 2.1 m (height). Total volume in each chamber was approximately 4320 L. An orifice plate was positioned in the exhaust duct of the chamber and was connected to a Dwyer Magnehelic Pressure Gauge.

Airflow in each chamber was approximately 1000 L/minute (14 air changes per hour) with a t_{99} (theoretically-derived time required for the chamber to reach 99% of the equilibrium concentration) of approximately 20 minutes.

The chambers were illuminated with artificial room light. Temperature (Minimum-Maximum Thermometer, Abbeon Cal., Inc.) and relative humidity (Airguide Instrument Company) gauges were placed inside each chamber during exposures. Chamber temperature, relative humidity, and airflow rate were recorded eleven times during each six-hour exposure.

Within each chamber, the animal cages were rotated daily to compensate for any possible, but undetected, variation in chamber exposure conditions (i.e., concentration, temperature, relative humidity). A detailed description of analytical procedures and results is found in Appendix 1A and B (definitive study).

Target concentrations were 0, 1000, 3000, and 6000 ppm. These exposure concentrations were determined by the Sponsor based on an exposure range-finding study also performed on pregnant New Zealand white rabbits (see Appendix 6).

Rabbits

One hundred eight (108) virgin female New Zealand white rabbits (at least 2.5 kg, approximately 5 to 5 1/2 months old) arrived from Hazleton Dutchland Laboratories, Inc., Denver, PA on September 23, 1986. Each animal was assigned a unique number and received a stainless steel Monel® ear tag (Gey Band and Tag Co., Morristown, PA). They were quarantined for two weeks, during which time they were examined by a veterinarian and fecal samples taken for detection of intestinal parasites. Quality control data indicated that these animals were in good health and suitable for use. The rabbits were individually housed in stainless steel wire-mesh cages (46 cm x 61 cm x 36 cm

high) with certified feed (Prolab Certified Rabbit Food®, Batch No. 6134 SMI and 6227 SMI, Agway, Inc., St. Marys, OH) and water (Municipal Authority of Westmoreland County, Greensburg, PA) available ad libitum except during exposures. Paperboard (Deotized Animal Cage Board®, Shepherd Specialty Papers, Inc., Kalamazoo, MI) was placed beneath the cages and photoperiod (12-hour, 0600 to 1800 hours for light phase), temperature and relative humidity were recorded continuously (Cole-Parmer Hygrothermograph® Seven-Day Continuous Recorder, Model No. 8368-00, Cole Parmer Instrument Co., Chicago, IL).

Female rabbits (at least 2.5 kg and 5.5-6 months old and in good health) were bred, using in-house breeding colony males from the same supplier in animal Room 122. The date of copulation was designated gestational day (gd) 0 (Hafez, 1970). Twenty-four (24) mated females were randomly assigned to each experimental group. The mating period was October 6-9, 1986; therefore gd 0 was also October 6-9, 1986. Mated females were individually housed in Animal Room 122 for the duration of the study (except during exposures).

For exposures, mated females were transferred to stainless steel wire-mesh exposure cages (35 cm x 37 cm x 41 cm high) in cage carriers which were moved into the chambers in room 139. Food and water were withheld during exposures. Exposures were for six hours per day, gd 6 through 18, in Room 139, October 12 through October 27, 1986. After each exposure, animals were returned to their original cages and "home" room. The animals were observed daily for clinical signs throughout the study (gd 0 through 29). Maternal body weights were taken on gd 0, 6, 9, 12, 15, 19 and 29.

At scheduled sacrifice on gd 29, rabbits were sacrificed by intravenous injection of T-61 euthanasia solution (Hoechst Corp., Sumerville, NJ) into the marginal ear vein. Maternal sacrifice period was November 4-7, 1986.

Thoracolaparotomy, Maternal and Fetal Examinations

The maternal body cavities were opened by midline thoracolaparotomy. The gravid uterus, ovaries (including corpora lutea), cervix, vagina, and abdominal and thoracic cavities were examined grossly. Ovarian corpora lutea of pregnancy were counted. Maternal liver and uterine weights were determined. Sections of maternal and nasal turbinates were retained in fixative for possible subsequent histologic examination. The uteri were immediately ligated at their cervical end to prevent the expulsion of conceptuses by myometrial peristalsis, externally examined for signs of hemorrhage, removed from the peritoneal cavity, and dissected longitudinally to expose their contents. All live and dead fetuses and resorption sites (early and late) were noted and recorded. Uteri from females that appeared nongravid were placed in a 10% ammonium sulfide solution for detection of early resorptions (Salewski, 1964).

Each fetus was euthanized immediately upon removal from the uterus by intraperitoneal injection of sodium pentobarbital. All live fetuses were weighed and were examined for external malformations including cleft palate, and variations. All live fetuses in each litter were examined for thoracic and abdominal visceral abnormalities by modification of methods described by

Staples (1974). The sex of each fetus was determined at the time of visceral examination. One half of the fetuses (even numbered fetuses from litters with an even number of live fetuses, odd numbered fetuses from litters with an odd number of live fetuses) examined visceraally were decapitated and their heads were fixed in Bouin's solution for examination of craniofacial structures by sectioning methods modified from Wilson (1965; 1973) and van Julsingha and Bennett (1977). Intact fetuses (not decapitated) in each litter were eviscerated, fixed in ethanol, and then processed for skeletal staining with alizarin red S (Crary, 1962; Peltzer and Schardein, 1966), and examined for skeletal malformations and variations. Decapitated fetuses were also eviscerated, fixed and processed for skeletal staining but were not examined.

Statistical Analyses

The unit of comparison was the pregnant doe or the litter (Weil, 1970). Results of the quantitative continuous variables (e.g., maternal body weights, liver weights, etc.) were intercompared for the three exposure groups and control group by use of Levene's test for equal variances (Levene, 1960), analysis of variance (ANOVA), and t-tests with Bonferroni probabilities. The t-tests were used when the F value from the ANOVA was significant. When Levene's test indicated homogeneous variances, and the ANOVA was significant, the pooled t-test was used for pairwise comparisons. When Levene's test indicated heterogeneous variances, all groups were compared by an ANOVA for unequal variances (Brown and Forsythe, 1974) followed, when necessary, by the separate variance t-test for pairwise comparisons.

Nonparametric data obtained following laparohysterectomy were statistically treated using the Kruskal-Wallis test (Sokal and Rohlf, 1969) followed by the Mann-Whitney U test (Sokal and Rohlf, 1969) when appropriate. Incidence data were compared using Fisher's Exact Test (Sokal and Rohlf, 1969). For all statistical tests, the fiducial limit of 0.05 (two-tailed) was used as the criterion for significance.

Personnel

The evaluation of 1,1,1-trichloroethane for developmental toxicity in New Zealand white rabbits was conducted at Bushy Run Research Center (BRRRC), Export, PA for Halogenated Solvents Industry Alliance, Washington, DC 20006. The Sponsor Liaison was Dr. J. A. Barter, PPG Industries, Pittsburgh, PA. The BRRRC personnel indicated below contributed to the completion of this study.

Dr. R. W. Tyl served as Study Director. Developmental Toxicity personnel included D. L. Fait, L. C. Fisher, M. F. Kubena (Study Leader), D. J. McNeil (Tarasi), T. A. Rebeck, and T. A. Savine. Inhalation personnel included Dr. D. E. Dodd, Dr. I. M. Pritts, W. J. Kintigh and J. L. Smith. Quality Assurance personnel included L. J. Calisti, J. R. Bernard and W. J. Conroy. Animal care personnel were supervised by M. J. Cardella.

The Final Report was prepared by Dr. R. W. Tyl with assistance from L. C. Fisher on data compilation and statistical analyses. The protocol and amendment detailing the design and conduct of this study are presented in Appendix 5.

Storage of Records

All original data sheets for the present study are stored in the BRRC Archives along with all biological samples collected during the course of the study which remain the responsibility of BRRC. Work sheets and computer prints which were generated in the statistical analysis of data are stored in the BRRC Archives. Copies of this report will be filed with the BRRC Archives. In accordance with EPA (TSCA), all records, data and reports will be maintained in storage for a minimum of ten (10) years or for as long as the quality of the preparation affords evaluation, whichever is less. The study was performed in compliance with Environmental Protection Agency good laboratory practices regulations (EPA, 1983).

RESULTS

Chamber Analyses

The mean analytical concentrations for the 1000, 3000 and 6000 ppm chambers were 1017 ± 17.7 ppm (101.7% of target), 3122 ± 38.6 ppm (104.1% of target) and 5906 ± 45.1 ppm (98.4% of target) respectively. No test chemical was detected in the control chamber (0 ppm) with a minimum detection limit of 10 ppm. The analytical to nominal concentration ratios were 0.90-0.96, indicating no degradation or adsorption of the test chemical to chamber walls. Temperature was maintained at 24.9-25.3°C and relative humidity at 41.4-49.7% for all four chambers (Table 1). Details of the procedures and results of the chamber analyses are presented in Appendix 1A and 1B.

Rabbits

The distribution and fate of all female rabbits on study are presented in Table 2. No does died; one doe at 0 ppm delivered early and was removed from study, one additional doe, at 1000 ppm, received a traumatic injury and was also removed from study. Pregnancy rate was high and equivalent across all groups. One litter at 0 ppm, five (5) at 1000 ppm and one (1) at 6000 ppm were completely resorbed at scheduled sacrifice on gd 29. A total of 16-21 litters were examined in each group.

Maternal body weights and weight change are presented in Table 3. There were no differences among groups in periodic body weights. However, there was a significant reduction in weight gain for does at 3000 and 6000 ppm for gd 6-9 (first third of the exposure period), for gd 6-19 (exposure period), and for gd 0-29 (gestation period) (Table 3).

There were no treatment-related clinical signs of toxicity during gestation except for loose feces observed in two does at 6000 ppm during the exposure period (Table 4). There were also no gross necropsy observations in does which were treatment related (Table 5).

There were no statistically significant changes in maternal body weight at sacrifice (absolute or corrected for gravid uterine weight), maternal corrected gestational weight change, or liver weight (absolute or relative to corrected body weight). There was, however, an apparent concentration-dependent decrease in corrected gestational weight change, with control does losing an average of 82 g and does at 3000 and 6000 ppm losing an average of 191 g and 134 g over the gestational period, respectively. Gravid uterine weight was significantly reduced at 1000 ppm because of five does with totally resorbed litters (Table 6). Individual maternal data are presented in Appendix 2.

Gestational parameters are presented in Table 7. There were no significant effects of treatment on any parameters examined, including number of ovarian corpora lutea, number of total, nonviable (early or late resorptions, or dead fetuses) or viable implantations, percent pre- or postimplantation loss, or sex ratio (% male fetuses). Corpora lutea per doe were slightly reduced (but not statistically significantly) at 6000 ppm, so total implants and viable implants per litter were also reduced (significant at $p < 0.05$), with no changes in preimplantation loss or non-viable implants per litter relative to controls. At 1000 ppm, the numbers of viable implants per litter and the percent live fetuses per litter were significantly reduced and the number of non-viable implants was significantly increased relative to controls because of the five resorbed litters. Fetal body weights per litter (males, females or total fetuses) were statistically equivalent across all groups. Individual fetal body weights (by uterine location) are presented in Appendix 3.

The incidence and frequency of rabbit fetal malformations and variations observed in the present study are presented in Tables 8 (malformations) and 9 (variations). There were no significant differences in the incidence of any individual malformation, of malformations by category (external, visceral or skeletal) or of total malformations. One fetus at 6000 ppm exhibited all of the external malformations observed except for dome-shaped head. One fetus at 1000 ppm exhibited both missing fourth ventricle of the brain and scrambled posterior portion of the cerebellum, and one additional fetus at 1000 ppm exhibited missing semilunar valves of the pulmonary artery and aorta, small right ventricle and enlarged left ventricle of heart. In addition, one fetus at 3000 ppm exhibited missing thoracic arch, fused thoracic arch and diagonally displaced thoracic centrum and arch. There were no significant differences in the incidence of individual external or visceral variations, of variations by category or of total variations. Out of 51 skeletal variations observed in the present study, one, extra thirteenth rib, bilateral, exhibited a significantly increased incidence at 6000 ppm, which may indicate slight fetotoxicity. Malformations and variations by individual fetuses and litters are presented in Appendix 4.

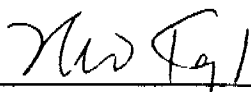
DISCUSSION

The present study has shown that exposure to 1,1,1-trichloroethane vapor by inhalation during organogenesis in New Zealand white rabbits results in maternal toxicity at 3000 and 6000 ppm. The only indication of possible fetotoxicity was a significant increase in bilateral extra thirteenth ribs at 6000 ppm observed in the presence of maternal toxicity. This is one of the most common rabbit fetal variations observed (Woo and Hoar, 1982). Khera (1985) reviewed teratology data from rabbit studies and indicated that extra ribs (among other findings) was consistently associated with maternal toxicity regardless of the test agent employed and attributed these fetal findings to maternal toxicity. Kenel *et al.* (1984) also ascribed the observation of extra ribs in rabbit fetuses to maternal and/or fetotoxicity. The slightly (but not statistically significantly) reduced fetal body weights observed in the present study at 3000 and 6000 ppm (associated with maternal toxicity) may also imply fetotoxicity although the values are within the historical controls for this rabbit strain in this laboratory and these findings are usually not considered evidence for fetotoxicity unless the differences are statistically significant relative to controls. Even if these data were interpreted as indicative of fetotoxicity, the A/D ratio (Fabro *et al.*, 1982), the ratio of the lowest doses resulting in adult and developmental toxicity would be equal to one (1.0), indicating no preferential susceptibility to the conceptus. This conclusion is consistent with the other data for this study indicating effects on the conceptus only at exposure concentrations detrimental to the doe.

CONCLUSIONS

Exposure to 1,1,1-trichloroethane vapor during organogenesis in New Zealand white rabbits resulted in maternal toxicity at 3000 and 6000 ppm and slight fetotoxicity at 6000 ppm. The "no observable effect level" (NOEL) for maternal toxicity was 1000 ppm and the developmental toxicity NOEL was 3000 ppm. No embryotoxicity or teratogenicity was observed at any exposure concentrations employed.

Reviewed and Approved by:


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Table 1

Exposure Parameters: Definitive Study

Target concentration, ppm	0	1000	3000	6000
Analytical concentration, ppm ^a	< MDL ^d	1017 ± 17.7	3122 ± 38.6	5906 ± 45.1
A/T Ratio ^b	-	1.017	1.041	0.984
Nominal concentration, ppm ^a	-	1134 ± 14.6	3234 ± 0.96	6534 ± 48.3
A/N Ratio ^{a,c}	-	0.90 ± 0.013	0.96 ± 0.014	0.90 ± 0.0096
Temperature, °C ^a	25.1 ± 1.08	25.1 ± 1.25	24.9 ± 1.10	25.3 ± 0.90
Relative humidity, % ^a	49.7 ± 3.18	44.5 ± 4.76	44.6 ± 4.35	41.4 ± 3.74

^a Grand mean of 16 daily means ± standard deviation

^b Analytical to target concentration ratio

^c Analytical to nominal concentration ratio

^d Less than the minimum detection limit of 10 ppm

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TABLE 2
DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
DISTRIBUTION AND FATE OF NEW ZEALAND WHITE RABBITS ON STUDY

PPM	0	1000	3000	6000
	NO. (%)	NO. (%)	NO. (%)	NO. (%)
FEMALES ON STUDY	24	24	24	24
FEMALES THAT DELIVERED EARLY	1 (4.2) ^a	0 (0.0)	0 (0.0)	0 (0.0)
FEMALES REMOVED FROM STUDY	0 (0.0)	1 (4.2) ^b	0 (0.0)	0 (0.0)
FEMALES THAT DIED	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
FEMALES EXAMINED AT LAPAROTOMY	23 (95.8)	23 (95.8)	24 (100.0)	24 (100.0)
NON GRAVID	1 (4.3)	2 (8.7)	4 (16.7)	3 (12.5)
GRAVID	22 (95.7)	21 (91.3)	20 (83.3)	21 (87.5)
RESORPTIONS ONLY	1 (4.5)	5 (23.8)	0 (0.0)	1 (4.8)
DAMS WITH VIABLE FETUSES	21 (95.5)	16 (76.2)	20 (100.0)	20 (95.2)
FEMALES THAT WERE GRAVID	22 (95.7)	21 (91.3)	20 (83.3)	21 (87.5)

a Female removed from study.

b Apparent cage accident; trauma.

TABLE 3
DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
MEAN GESTATIONAL BODY WEIGHTS AND WEIGHT CHANGES

		PPM	0	1000	3000	6000
<u>GESTATIONAL BODY WEIGHTS (GRAMS)</u>						
DAY	0	MEAN	3452.4	3506.6	3481.1	3502.9
		S.D.	196.11	285.12	269.79	286.73
		N	22	21	20	21
DAY	6	MEAN	3601.8	3622.8	3626.3	3619.0
		S.D.	194.87	316.94	265.82	277.88
		N	22	21	20	21
DAY	9	MEAN	3574.3	3567.4	3538.4	3543.9
		S.D.	218.42	312.48	220.69	261.93
		N	22	21	20	21
DAY	12	MEAN	3590.2	3575.0	3537.3	3524.9
		S.D.	213.82	324.68	231.66	253.39
		N	22	21	20	21
DAY	15	MEAN	3641.3	3612.7	3582.1	3557.7
		S.D.	222.95	335.46	233.09	232.76
		N	22	21	20	21
DAY	19	MEAN	3691.5	3621.0	3569.0	3563.3
		S.D.	225.12	358.78	258.69	224.80
		N	22	21	20	21
DAY	29	MEAN	3897.9	3819.7	3783.0	3797.8
		S.D.	239.19	395.15	285.93	266.90
		N	22	21	20	21
<u>GESTATIONAL BODY WEIGHT CHANGES (GRAMS)</u>						
DAY	0 TO 6	MEAN	149.4	116.2	145.2	116.1
	(PRE-TREATMENT)	S.D.	112.88	120.55	124.62	97.53
		N	22	21	20	21
DAY	6 TO 9	MEAN	-27.5	-55.4	-87.9**	-75.2*
		S.D.	54.64	49.30	64.05	57.95
		N	22	21	20	21
DAY	9 TO 12	MEAN	15.9	7.6	-1.1	-19.0
		S.D.	37.38	59.10	61.26	50.12
		N	22	21	20	21
DAY	12 TO 15	MEAN	51.0	37.7	44.8	32.8
		S.D.	58.97	82.10	61.51	74.32
		N	22	21	20	21
DAY	15 TO 19	MEAN	50.3	8.3	-13.0*	5.6
		S.D.	43.64	89.64	67.00	73.01
		N	22	21	20	21

TABLE 3
DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
MEAN GESTATIONAL BODY WEIGHTS AND WEIGHT CHANGES

	PPM	0	1000	3000	6000
DAY 6 TO 19 (TREATMENT)					
MEAN		89.7	-1.8	-57.3**	-55.7**
S.D.		91.23	140.34	142.55	139.30
N		22	21	20	21
DAY 19 TO 29 (POST-TREATMENT)					
MEAN		206.4	198.7	214.0	234.5
S.D.		59.22	109.60	134.78	106.38
N		22	21	20	21
DAY 0 TO 29 (GESTATION)					
MEAN		445.5	313.1	301.9*	294.8*
S.D.		165.9	178.39	194.12	183.50
N		22	21	20	21

MEAN DIFFERENCES CALCULATED FROM INDIVIDUAL DIFFERENCES

* p < 0.05 compared to control.

** p < 0.01 compared to control.

TABLE 4
DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
MATERNAL CLINICAL OBSERVATIONS BY GESTATION DAY

CATEGORY	FINDING (LOCATION)	GESTATIONAL DAYS	ppm			
			0	1000	3000	6000
DEAD	SCHEDULED SACRIFICE	19- 29	22	21	20	21
EYES/EARS/NOSE	LACRIMATION (EYE-LEFT)	6- 18	0	0	1	0
		19- 29	0	0	1	0
	OCULAR DISCHARGE, OTHER (EYE-BOTH, EYE-LEFT)	6- 18	0	0	1	1
		19- 29	0	0	1	1
EXCRETA	LOOSE FECES	6- 18	0	0	0	2
	PAPERBOARD DRY	6- 18	0	0	1	0
FOOD/WATER	FEED HOPPER FULL	6- 18	0	1	1	0
		19- 29	0	1	3	0
SKIN	ALOPECIA (HIP-BOTH, SIDE-BOTH)	6- 18	0	0	0	1
		19- 29	0	0	0	1
	ABSCESS (NECK)	19- 29	0	0	1	0
OTHER	WATER TIP NOT FUNCTIONING - DRY PAPERBOARD	6- 18	0	0	1	0
	BLOOD (BY HEMASTIX) ON PAPERBOARD	19- 29	0	2	0	1
	TISSUE ON PAPERBOARD (UNRECOGNIZABLE)	19- 29	0	2	0	0

TABLE 5
DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
MATERNAL GROSS NECROPSY OBSERVATIONS

PPM	0	1000	3000	6000
NUMBER OF ANIMALS IN DOSE GROUP	22	21	20	21
OVARIES				
-CYST	1	0	0	0
CORPORA LUTEA				
-ABSENT ^a	0	2	0	0
UTERUS				
-CYST	0	1	0	0
-CONTAINS LIQUID FLUID	0	1	0	0
-MISSING RIGHT UTERINE HORN	0	0	0	1
VAGINA				
-DISCHARGE BLOODY	0	1	0	0
AMNIOTIC SACS				
-ABSENT ^a	1	5	0	1
PLACENTAS				
-ABSENT ^a	1	5	0	1
-CONTAINS BLOOD (BY HEMASTIX)	0	0	0	1

^a These findings are the result of litters containing early resorptions only or does found to be gravid by ammonium sulfide staining of the uterus.

TABLE 6
DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
MATERNAL ORGAN WEIGHTS AT SACRIFICE

PPM	0	1000	3000	6000
INITIAL BODY WEIGHT (g)				
MEAN	3452.4	3506.6	3481.1	3502.9
S.D.	196.11	285.12	269.79	286.73
N	22	21	20	21
BODY WEIGHT AT SACRIFICE (g)				
MEAN	3897.9	3819.7	3783.0	3797.8
S.D.	239.19	395.15	285.93	266.90
N	22	21	20	21
GRAVID UTERINE WEIGHT (g)				
MEAN	527.98	371.30*	492.46	429.09
S.D.	140.25	214.04	139.05	124.63
N	22	21	20	21
CORRECTED BODY WEIGHT (g) ^a				
MEAN	3369.89	3448.40	3290.57	3368.70
S.D.	280.33	359.84	258.27	318.29
N	22	21	20	21
CORRECTED BODY WEIGHT CHANGE (g) ^b				
MEAN	-82.50	-58.17	-190.53	-134.25
S.D.	227.72	192.74	194.55	169.02
N	22	21	20	21
LIVER WEIGHT (g)				
MEAN	89.32	92.46	91.11	95.49
S.D.	11.54	27.97	15.54	13.22
N	22	21	20	21
RELATIVE LIVER WEIGHT (%) ^c				
MEAN	2.65	2.68	2.76	2.83
S.D.	0.29	0.74	0.35	0.25
N	22	21	20	21

a Corrected body weight = body weight at sacrifice minus gravid uterine weight.
b Corrected body weight change = corrected body weight minus initial body weight.
c Calculated as a percentage of the corrected body weight.
* p < 0.05 compared to control.

TABLE 7
DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
GESTATIONAL PARAMETERS AT SACRIFICE

PPM	0	1000	3000	6000
CORPORA LUTEA/DOE				
MEAN	10.3	8.8	10.6	9.2
S.D.	1.6	3.3	1.8	2.2
N	22	21	20	21
TOTAL IMPLANTS/LITTER				
MEAN	9.4	8.2	9.3	8.2*
S.D.	2.3	2.2	2.7	1.8
N	22	21	20	21
PERCENT PREIMPLANTATION LOSS ^a				
MEAN	9.9	8.8	12.8	10.8
S.D.	16.5	12.2	19.2	12.0
N	22	21	20	21
VIABLE IMPLANTS				
MEAN	8.4	5.2**	8.3	7.0*
S.D.	2.8	3.6	3.1	2.6
N	22	21	20	21
NON-VIABLE IMPLANTS				
MEAN	1.0	3.0*	1.0	1.1
S.D.	1.7	3.1	2.1	1.6
N	22	21	20	21
EARLY RESORPTIONS				
MEAN	0.9	2.4	0.4	0.9
S.D.	1.7	2.9	0.9	1.3
N	22	21	20	21
LATE RESORPTIONS				
MEAN	0.0	0.3	0.0	0.0
S.D.	0.0	1.3	0.0	0.2
N	22	21	20	21
DEAD FETUSES				
MEAN	0.1	0.3	0.6	0.2
S.D.	0.3	0.6	2.0	0.6
N	22	21	20	21
PERCENT LIVE FETUSES				
MEAN	89.6	60.3**	90.2	83.8
S.D.	21.1	40.4	20.0	25.1
N	22	21	20	21

TABLE 7
DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
GESTATIONAL PARAMETERS AT SACRIFICE

PPM	0	1000	3000	6000
SEX RATIO (%MALE FETUSES)				
MEAN	48.9	59.5	45.7	48.7
S.D.	16.0	22.1	24.1	23.0
N	21	16	20	20
FETAL BODY WEIGHTS PER LITTER (GRAMS)				
ALL FETUSES				
MEAN	43.16	44.23	39.46	40.19
S.D.	5.59	5.22	5.74	4.42
N	21	16	20	20
MALE FETUSES				
MEAN	43.13	44.65	39.14	41.17
S.D.	5.94	5.90	5.42	4.86
N	21	16	18	19
FEMALE FETUSES				
MEAN	43.25	43.14	39.15	39.33
S.D.	5.98	5.72	5.77	4.18
N	21	15	20	20

^a Percent preimplantation loss = corpora lutea minus total implants divided by corpora lutea multiplied by 100.

* p < 0.05 compared to control.

** p < 0.01 compared to control.

TABLE 8
DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
MALFORMATIONS OBSERVED IN FETUSES AND LITTERS^a

GROUP (ppm):	F E T U S E S				L I T T E R S			
	0	1000	3000	6000	0	1000	3000	6000
NUMBER EXAMINED EXTERNALLY ^b	185	110	165	148	21	16	20	20
DOME-SHAPED HEAD	0 0.0	1 0.9	1 0.6	1 0.7	0 0.0	1 6.2	1 5.0	1 5.0
MICROAGNATHIA	0 0.0	0 0.0	0 0.0	1 0.7	0 0.0	0 0.0	0 0.0	1 5.0
SNOUT SHORT	0 0.0	0 0.0	0 0.0	1 0.7	0 0.0	0 0.0	0 0.0	1 5.0
FOREPAWS RIGIDLY FLEXED - BILATERAL	0 0.0	0 0.0	0 0.0	1 0.7	0 0.0	0 0.0	0 0.0	1 5.0
INVERSION - LEFT HINDPAW	0 0.0	0 0.0	0 0.0	1 0.7	0 0.0	0 0.0	0 0.0	1 5.0

None significantly different from control
See footnotes on last page of table.

TABLE 8
DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
MALFORMATIONS OBSERVED IN FETUSES AND LITTERS^a

GROUP (ppm):	F E T U S E S				L I T T E R S			
	0	1000	3000	6000	0	1000	3000	6000
NUMBER EXAMINED VISCERALLY ^c	185	110	165	148	21	16	20	20
LATERAL VENTRICLE DILATED - TISSUE DEPRESSED	10 5.4	5 4.5	3 1.8	5 3.4	5 23.8	3 18.7	3 15.0	4 20.0
CAVITATION ORAL CAVITY	1 0.5	0 0.0	0 0.0	0 0.0	1 4.8	0 0.0	0 0.0	0 0.0
CAVITATION IN MEDULLA	0 0.0	1 0.9	0 0.0	1 0.7	0 0.0	1 6.2	0 0.0	1 5.0
THIRD VENTRICLE DILATED - TISSUE DEPRESSED	0 0.0	0 0.0	1 0.6	1 0.7	0 0.0	0 0.0	1 5.0	1 5.0
FOURTH VENTRICLE MISSING	0 0.0	1 0.9	0 0.0	0 0.0	0 0.0	1 6.2	0 0.0	0 0.0
POSTERIOR PORTION OF CEREBELLUM SCRAMBLED	0 0.0	1 0.9	0 0.0	0 0.0	0 0.0	1 6.2	0 0.0	0 0.0
ENLARGED AORTA	0 0.0	1 0.9	0 0.0	1 0.7	0 0.0	1 6.2	0 0.0	1 5.0
SMALL BUT PATENT PULMONARY ARTERY	0 0.0	0 0.0	0 0.0	1 0.7	0 0.0	0 0.0	0 0.0	1 5.0
VENTRICULAR SEPTAL DEFECT	0 0.0	1 0.9	1 0.6	2 1.4	0 0.0	1 6.2	1 5.0	1 5.0
SEMILUNAR VALVES OF THE PULMONARY ARTERY MISSING	0 0.0	1 0.9	0 0.0	1 0.7	0 0.0	1 6.2	0 0.0	1 5.0
SEMILUNAR VALVES OF THE AORTA MISSING	0 0.0	1 0.9	0 0.0	1 0.7	0 0.0	1 6.2	0 0.0	1 5.0
RIGHT VENTRICLE OF THE HEART SMALL	0 0.0	1 0.9	0 0.0	1 0.7	0 0.0	1 6.2	0 0.0	1 5.0

None significantly different from control
See footnotes on last page of table.

TABLE 8
DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
MALFORMATIONS OBSERVED IN FETUSES AND LITTERS^a

GROUP (ppm):	F E T U S E S				L I T T E R S			
	0	1000	3000	6000	0	1000	3000	6000
NUMBER EXAMINED VISCERALLY ^c	185	110	165	148	21	16	20	20
LEFT VENTRICLE OF THE HEART ENLARGED	0 0.0	0 0.0	0 0.0	1 0.7	0 0.0	0 0.0	0 0.0	1 5.0
HOLE IN EXTERIOR OF LEFT ATRIUM	0 0.0	1 0.9	0 0.0	0 0.0	0 0.0	1 6.2	0 0.0	0 0.0
PAPILLARY MUSCLES MISSING - RIGHT VENTRICLE	0 0.0	1 0.9	0 0.0	0 0.0	0 0.0	1 6.2	0 0.0	0 0.0
ECTOPIC TESTIS	0 0.0	0 0.0	0 0.0	1 0.7	0 0.0	0 0.0	0 0.0	1 5.0
GALLBLADDER MISSING	1 0.5	0 0.0	1 0.6	0 0.0	1 4.8	0 0.0	1 5.0	0 0.0
TEETH PRIMORDIA MISSING	0 0.0	1 0.9	0 0.0	0 0.0	0 0.0	1 6.2	0 0.0	0 0.0

None significantly different from control
See footnotes on last page of table.

SL 042590

TABLE 8
DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
MALFORMATIONS OBSERVED IN FETUSES AND LITTERS^a

GROUP (ppm):	F E T U S E S				L I T T E R S			
	0	1000	3000	6000	0	1000	3000	6000
NUMBER EXAMINED SKELETALLY ^d	86	51	76	72	21	16	20	20
CERVICAL RIB - CERVICAL ARCH #7 - UNILATERAL	0 0.0	0 0.0	0 0.0	1 1.4	0 0.0	0 0.0	0 0.0	1 5.0
CERVICAL ARCH #3 MISSING - UNILATERAL	0 0.0	0 0.0	0 0.0	1 1.4	0 0.0	0 0.0	0 0.0	1 5.0
EXTRA CERVICAL CENTRUM FUSED TO CENTRUM #7	0 0.0	0 0.0	0 0.0	1 1.4	0 0.0	0 0.0	0 0.0	1 5.0
EXTRA CERVICAL ARCH - UNILATERAL - TOTAL OF 7	0 0.0	0 0.0	0 0.0	1 1.4	0 0.0	0 0.0	0 0.0	1 5.0
LATERAL CURVATURE OF SPINE - CERVICAL AREA	0 0.0	0 0.0	0 0.0	1 1.4	0 0.0	0 0.0	0 0.0	1 5.0
THORACIC ARCH MISSING - UNILATERAL	1 1.2	0 0.0	1 1.3	0 0.0	1 4.8	0 0.0	1 5.0	0 0.0
THORACIC CENTRUM AND ARCHES DIAGONALLY DISPLACED	1 1.2	0 0.0	1 1.3	0 0.0	1 4.8	0 0.0	1 5.0	0 0.0
THORACIC ARCHES FUSED - UNILATERAL	0 0.0	0 0.0	1 1.3	0 0.0	0 0.0	0 0.0	1 5.0	0 0.0
LUMBAR CENTRUM AND ARCHES DIAGONALLY DISPLACED	1 1.2	0 0.0	0 0.0	0 0.0	1 4.8	0 0.0	0 0.0	0 0.0
RIB #10 - FORKED - UNILATERAL	0 0.0	0 0.0	0 0.0	1 1.4	0 0.0	0 0.0	0 0.0	1 5.0
RIB #11 - MISSING - UNILATERAL	1 1.2	0 0.0	0 0.0	0 0.0	1 4.8	0 0.0	0 0.0	0 0.0
RIB #3 MISSING - UNILATERAL	0 0.0	0 0.0	1 1.3	0 0.0	0 0.0	0 0.0	1 5.0	0 0.0

None significantly different from control
See footnotes on last page of table.

SL 042591

TABLE 8
DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
MALFORMATIONS OBSERVED IN FETUSES AND LITTERS^a

GROUP (ppm):	F E T U S E S				L I T T E R S			
	0	1000	3000	6000	0	1000	3000	6000
NUMBER EXAMINED SKELETALLY ^d	86	51	76	72	21	16	20	20
EXTRA RIB BETWEEN EXISTING RIBS - UNILATERAL	0 0.0	0 0.0	1 1.3	0 0.0	0 0.0	0 0.0	1 5.0	0 0.0
RIBS #2 THROUGH #5 FUSED	0 0.0	0 0.0	1 1.3	0 0.0	0 0.0	0 0.0	1 5.0	0 0.0

None significantly different from control
See footnotes on last page of table.

TABLE 8
DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
MALFORMATIONS OBSERVED IN FETUSES AND LITTERS^a

GROUP (ppm):	F E T U S E S				L I T T E R S			
	0	1000	3000	6000	0	1000	3000	6000
TOTAL MALFORMATIONS								
NUMBER WITH EXTERNAL MALFORMATIONS	0	1	1	2	0	1	1	2
PERCENT WITH EXTERNAL MALFORMATIONS	0.0	0.9	0.6	1.4	0.0	6.2	5.0	10.0
NUMBER WITH SOFT TISSUE MALFORMATIONS	11	9	6	10	6	6	6	6
PERCENT WITH SOFT TISSUE MALFORMATIONS	5.9	8.2	3.6	6.8	28.6	37.5	30.0	30.0
NUMBER WITH SKELETAL MALFORMATIONS	1	0	1	2	1	0	1	2
PERCENT WITH SKELETAL MALFORMATIONS	1.2	0.0	1.3	2.8	4.8	0.0	5.0	10.0
TOTAL NUMBER WITH MALFORMATIONS	12	10	8	13	6	6	7	8
TOTAL PERCENT WITH MALFORMATIONS	6.5	9.1	4.8	8.8	28.6	37.5	35.0	40.0

None significantly different from control

^a For all findings, the number (of fetuses affected or litters with one or more affected fetuses) is presented on top and the percentage of the total (fetuses or litters) examined is presented beneath. A single fetus may be represented more than once in listing individual defects. Only live fetuses were examined.

^b All fetuses were examined externally.

^c All fetuses were examined visceraally (Staples, 1974), and approximately 50% of each litter were examined for soft tissue craniofacial defects (Wilson, 1965; van Julsingha and Bennett, 1977).

^d Approximately 50% of each litter were examined for skeletal defects after staining with alizarin red S.

TABLE 9
DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
VARIATIONS OBSERVED IN FETUSES AND LITTERS^a

GROUP (ppm):	F E T U S E S				L I T T E R S			
	0	1000	3000	6000	0	1000	3000	6000
NUMBER EXAMINED EXTERNALLY ^b	185	110	165	148	21	16	20	20
ECCHYMOSIS - HEAD	1 0.5	1 0.9	6 3.6	9 6.1	1 4.8	1 6.2	4 20.0	5 25.0
ECCHYMOSIS - TRUNK	6 3.2	1 0.9	1 0.6	1 0.7	6 28.6	1 6.2	1 5.0	1 5.0
ECCHYMOSIS - EXTREMITIES	3 1.6	0 0.0	3 1.8	5 3.4	3 14.3	0 0.0	3 15.0	4 20.0
EYE BULGE FLATTENED	0 0.0	1 0.9	0 0.0	1 0.7	0 0.0	1 6.2	0 0.0	1 5.0

None significantly different from control
See footnotes on last page of table.

TABLE 9
DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
VARIATIONS OBSERVED IN FETUSES AND LITTERS^a

GROUP (ppm):	F E T U S E S				L I T T E R S			
	0	1000	3000	6000	0	1000	3000	6000
NUMBER EXAMINED VISCERALLY ^c	185	110	165	148	21	16	20	20
IRREGULAR RUGAE	3 1.6	4 3.6	3 1.8	1 0.7	2 9.5	3 18.7	3 15.0	1 5.0
THIRD VENTRICLE DILATED - NO DEPRESSION	7 3.8	2 1.8	6 3.6	7 4.7	6 28.6	2 12.5	5 25.0	6 30.0
LATERAL VENTRICLE DILATED - NO DEPRESSION	6 3.2	6 5.5	12 7.3	6 4.1	5 23.8	6 37.5	7 35.0	6 30.0
DARK BROWN MATERIAL AMONG BRAIN SECTIONS	0 0.0	2 1.8	2 1.2	0 0.0	0 0.0	2 12.5	2 10.0	0 0.0
DARK BROWN AREA OF BRAIN TISSUE	0 0.0	2 1.8	0 0.0	0 0.0	0 0.0	1 6.2	0 0.0	0 0.0
THYMUS DARK RED	1 0.5	0 0.0	0 0.0	0 0.0	1 4.8	0 0.0	0 0.0	0 0.0
SMALL BUT PATENT DUCTUS ARTERIOSUS	0 0.0	1 0.9	0 0.0	0 0.0	0 0.0	1 6.2	0 0.0	0 0.0
RIGHT SUBCLAVIAN ARTERY SMALL	0 0.0	1 0.9	0 0.0	0 0.0	0 0.0	1 6.2	0 0.0	0 0.0
MEMBRANOUS VENTRICULAR SEPTUM THINNED	0 0.0	0 0.0	0 0.0	1 0.7	0 0.0	0 0.0	0 0.0	1 5.0
LEFT ATRIUM PALE	0 0.0	1 0.9	0 0.0	0 0.0	0 0.0	1 6.2	0 0.0	0 0.0
FETAL ATELECTASIS	2 1.1	2 1.8	6 3.6	0 0.0	2 9.5	2 12.5	5 25.0	0 0.0
PARTIAL FETAL ATELECTASIS	0 0.0	0 0.0	0 0.0	1 0.7	0 0.0	0 0.0	0 0.0	1 5.0

None significantly different from control
See footnotes on last page of table.

TABLE 9
DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
VARIATIONS OBSERVED IN FETUSES AND LITTERS^a

GROUP (ppm):	F E T U S E S				L I T T E R S			
	0	1000	3000	6000	0	1000	3000	6000
NUMBER EXAMINED VISCERALLY ^c	185	110	165	148	21	16	20	20
AZYGOUS LUNG LOBE MISSING	8 4.3	1 0.9	3 1.8	7 4.7	5 23.8	1 6.2	3 15.0	4 20.0
LIVER PALE	1 0.5	0 0.0	0 0.0	0 0.0	1 4.8	0 0.0	0 0.0	0 0.0
SPLEEN PALE	2 1.1	0 0.0	6 3.6	0 0.0	1 4.8	0 0.0	1 5.0	0 0.0
DARK GREEN FLUID IN STOMACH	0 0.0	0 0.0	0 0.0	1 0.7	0 0.0	0 0.0	0 0.0	1 5.0
DARK GREEN FLUID IN INTESTINES	0 0.0	0 0.0	0 0.0	1 0.7	0 0.0	0 0.0	0 0.0	1 5.0
DILATED RENAL PELVIS - UNILATERAL	0 0.0	0 0.0	1 0.6	1 0.7	0 0.0	0 0.0	1 5.0	1 5.0
DILATED URETER - UNILATERAL	0 0.0	0 0.0	1 0.6	0 0.0	0 0.0	0 0.0	1 5.0	0 0.0
RIGHT TESTIS THIN WITH NO CHARACTERISTIC SHAPE	0 0.0	0 0.0	0 0.0	1 0.7	0 0.0	0 0.0	0 0.0	1 5.0
REDUCED NUMBER OF TEETH PRIMORDIA	0 0.0	0 0.0	0 0.0	2 1.4	0 0.0	0 0.0	0 0.0	2 10.0
TEETH PRIMORDIA SMALLER THAN NORMAL	0 0.0	0 0.0	0 0.0	1 0.7	0 0.0	0 0.0	0 0.0	1 5.0

None significantly different from control
See footnotes on last page of table.

TABLE 9
DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
VARIATIONS OBSERVED IN FETUSES AND LITTERS^a

GROUP (ppm):	F E T U S E S				L I T T E R S			
	0	1000	3000	6000	0	1000	3000	6000
NUMBER EXAMINED SKELETALLY ^d	86	51	76	72	21	16	20	20
CERVICAL CENTRA #1,#2,#3 AND/OR #4 POORLY OSSIFIED	4 4.7	2 3.9	5 6.6	5 6.9	2 9.5	2 12.5	3 15.0	3 15.0
CERVICAL CENTRUM #2 DIAGONALLY DISPLACED	0 0.0	0 0.0	0 0.0	1 1.4	0 0.0	0 0.0	0 0.0	1 5.0
CERVICAL CENTRUM #7 BILOBED	0 0.0	0 0.0	0 0.0	1 1.4	0 0.0	0 0.0	0 0.0	1 5.0
EXTRA #13 THORACIC CENTRUM AND ARCHES	22 25.6	17 33.3	29 38.2	43 59.7	13 61.9	9 56.2	15 75.0	18 90.0
THORACIC CENTRUM #6 BILOBED	1 1.2	0 0.0	1 1.3	2 2.8	1 4.8	0 0.0	1 5.0	2 10.0
EXTRA THORACIC ARCH BETWEEN EXISTING ARCHES	0 0.0	0 0.0	0 0.0	1 1.4	0 0.0	0 0.0	0 0.0	1 5.0
EXTRA ARCH SMALL	0 0.0	0 0.0	0 0.0	1 1.4	0 0.0	0 0.0	0 0.0	1 5.0
THORACIC CENTRUM #7 BILOBED	1 1.2	0 0.0	0 0.0	1 1.4	1 4.8	0 0.0	0 0.0	1 5.0
THORACIC CENTRUM #11 POORLY OSSIFIED	1 1.2	0 0.0	0 0.0	0 0.0	1 4.8	0 0.0	0 0.0	0 0.0
THORACIC CENTRUM #2 SPLIT	0 0.0	0 0.0	1 1.3	0 0.0	0 0.0	0 0.0	1 5.0	0 0.0
THORACIC CENTRUM #3 SPLIT	0 0.0	0 0.0	1 1.3	0 0.0	0 0.0	0 0.0	1 5.0	0 0.0
THORACIC CENTRUM #4 SPLIT	0 0.0	0 0.0	1 1.3	0 0.0	0 0.0	0 0.0	1 5.0	0 0.0

None significantly different from control
See footnotes on last page of table.

TABLE 9
DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
VARIATIONS OBSERVED IN FETUSES AND LITTERS^a

GROUP (ppm):	F E T U S E S				L I T T E R S			
	0	1000	3000	6000	0	1000	3000	6000
NUMBER EXAMINED SKELETALLY ^d	86	51	76	72	21	16	20	20
LUMBAR CENTRUM #1 POORLY OSSIFIED	0 0.0	0 0.0	0 0.0	1 1.4	0 0.0	0 0.0	0 0.0	1 5.0
LUMBAR CENTRUM #2 POORLY OSSIFIED	0 0.0	0 0.0	0 0.0	1 1.4	0 0.0	0 0.0	0 0.0	1 5.0
LUMBAR ARCHES #6 POORLY OSSIFIED	0 0.0	0 0.0	1 1.3	0 0.0	0 0.0	0 0.0	1 5.0	0 0.0
LUMBAR ARCHES #1 POORLY OSSIFIED	0 0.0	0 0.0	1 1.3	0 0.0	0 0.0	0 0.0	1 5.0	0 0.0
LUMBAR ARCHES #2 POORLY OSSIFIED	0 0.0	0 0.0	1 1.3	0 0.0	0 0.0	0 0.0	1 5.0	0 0.0
LUMBAR CENTRUM #7 POORLY OSSIFIED	1 1.2	0 0.0	0 0.0	0 0.0	1 4.8	0 0.0	0 0.0	0 0.0
RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL	13 15.1	5 9.8	3 3.9	4 5.6	10 47.6	5 31.2	3 15.0	4 20.0
RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - BILATERAL	3 3.5	2 3.9	4 5.3	1 1.4	3 14.3	2 12.5	3 15.0	1 5.0
EXTRA RIB #13 - FIRST LUMBAR ARCH - UNILATERAL	9 10.5	5 9.8	2 2.6	6 8.3	6 28.6	5 31.2	2 10.0	6 30.0
EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	23 26.7	9 17.6	22 28.9	18 25.0	17 81.0	8 50.0	14 70.0	10 50.0
RUDIMENTARY RIB #13 - THORACIC ARCH #13 - UNILATERAL	1 1.2	0 0.0	1 1.3	1 1.4	1 4.8	0 0.0	1 5.0	1 5.0
RUDIMENTARY RIB #13 - THORACIC ARCH #13 - BILATERAL	0 0.0	1 2.0	0 0.0	0 0.0	0 0.0	1 6.2	0 0.0	0 0.0

None significantly different from control
See footnotes on last page of table.

TABLE 9
DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
VARIATIONS OBSERVED IN FETUSES AND LITTERS^a

GROUP (ppm):	F E T U S E S				L I T T E R S			
	0	1000	3000	6000	0	1000	3000	6000
NUMBER EXAMINED SKELETALLY ^d	86	51	76	72	21	16	20	20
EXTRA RIB #13 - THORACIC ARCH #13 - UNILATERAL	0 0.0	0 0.0	3 3.9	1 1.4	0 0.0	0 0.0	3 15.0	1 5.0
EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	21 24.4	15 29.4	26 34.2	42 58.3	12 57.1	9 56.2	15 75.0	18* 90.0
FRONTAL BONE - POORLY OSSIFIED	0 0.0	1 2.0	1 1.3	1 1.4	0 0.0	1 6.2	1 5.0	1 5.0
PARIETAL - POORLY OSSIFIED	2 2.3	0 0.0	1 1.3	1 1.4	2 9.5	0 0.0	1 5.0	1 5.0
INTERPARIETAL - POORLY OSSIFIED	0 0.0	0 0.0	0 0.0	1 1.4	0 0.0	0 0.0	0 0.0	1 5.0
BODY OF THE HYOID - POORLY OSSIFIED	3 3.5	4 7.8	4 5.3	5 6.9	2 9.5	1 6.2	3 15.0	4 20.0
MAXILLARY - POORLY OSSIFIED	0 0.0	1 2.0	2 2.6	1 1.4	0 0.0	1 6.2	2 10.0	1 5.0
PARIETAL - HOLE IN BONE	1 1.2	0 0.0	1 1.3	0 0.0	1 4.8	0 0.0	1 5.0	0 0.0
SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED	8 9.3	5 9.8	14 18.4	21 29.2	4 19.0	4 25.0	7 35.0	10 50.0
MAJORITY INTER.PHALANGES (FORELIMB) POORLY OSSIFIED	0 0.0	0 0.0	0 0.0	1 1.4	0 0.0	0 0.0	0 0.0	1 5.0
SOME INTER.PHALANGES (HINDLIMB) POORLY OSSIFIED	0 0.0	0 0.0	0 0.0	1 1.4	0 0.0	0 0.0	0 0.0	1 5.0
STERNEBRA #2 POORLY OSSIFIED	1 1.2	0 0.0	1 1.3	1 1.4	1 4.8	0 0.0	1 5.0	1 5.0

*= significantly different from control at .05 level using two-tailed Fisher's exact test.
See footnotes on last page of table.

TABLE 9
DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
VARIATIONS OBSERVED IN FETUSES AND LITTERS^a

GROUP (ppm):	F E T U S E S				L I T T E R S			
	0	1000	3000	6000	0	1000	3000	6000
NUMBER EXAMINED SKELETALLY ^d	86	51	76	72	21	16	20	20
STERNEBRA #4 POORLY OSSIFIED	0 0.0	0 0.0	0 0.0	1 1.4	0 0.0	0 0.0	0 0.0	1 5.0
STERNEBRA #5 POORLY OSSIFIED	22 25.6	13 25.5	26 34.2	13 18.1	9 42.9	8 50.0	12 60.0	9 45.0
STERNEBRA #6 POORLY OSSIFIED	30 34.9	5 9.8	10 13.2	14 19.4	13 61.9	4 25.0	6 30.0	9 45.0
STERNEBRA #5 UNOSSIFIED	2 2.3	1 2.0	3 3.9	5 6.9	2 9.5	1 6.2	3 15.0	4 20.0
STERNEBRA #6 UNOSSIFIED	0 0.0	1 2.0	1 1.3	2 2.8	0 0.0	1 6.2	1 5.0	2 10.0
STERNEBRAE #1 AND #2 FUSED	0 0.0	0 0.0	1 1.3	0 0.0	0 0.0	0 0.0	1 5.0	0 0.0
STERNEBRAE #4 AND #5 FUSED	2 2.3	0 0.0	1 1.3	0 0.0	2 9.5	0 0.0	1 5.0	0 0.0
EXTRA OSSIF. SITE ABOVE STERNEBRA SEGMENT #1	0 0.0	1 2.0	0 0.0	1 1.4	0 0.0	1 6.2	0 0.0	1 5.0
STERNEBRA #1 BILOBED	0 0.0	0 0.0	0 0.0	1 1.4	0 0.0	0 0.0	0 0.0	1 5.0
STERNEBRA #2 BILOBED	0 0.0	0 0.0	0 0.0	1 1.4	0 0.0	0 0.0	0 0.0	1 5.0
STERNEBRA #3 BILOBED	0 0.0	0 0.0	0 0.0	1 1.4	0 0.0	0 0.0	0 0.0	1 5.0
STERNEBRA #4 BILOBED	0 0.0	0 0.0	0 0.0	1 1.4	0 0.0	0 0.0	0 0.0	1 5.0

None significantly different from control
See footnotes on last page of table.

TABLE 9
DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
VARIATIONS OBSERVED IN FETUSES AND LITTERS^a

GROUP (ppm):	F E T U S E S				L I T T E R S			
	0	1000	3000	6000	0	1000	3000	6000
NUMBER EXAMINED SKELETALLY ^d	86	51	76	72	21	16	20	20
STERNEBRA #5 BILOBED	0 0.0	0 0.0	0 0.0	1 1.4	0 0.0	0 0.0	0 0.0	1 5.0
STERNEBRA #6 BILOBED	0 0.0	0 0.0	0 0.0	1 1.4	0 0.0	0 0.0	0 0.0	1 5.0
STERNEBRAE #2 THROUGH #5 FUSED	0 0.0	0 0.0	0 0.0	1 1.4	0 0.0	0 0.0	0 0.0	1 5.0

None significantly different from control
See footnotes on last page of table.

TABLE 9
DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
VARIATIONS OBSERVED IN FETUSES AND LITTERS^a

GROUP (ppm):	F E T U S E S				L I T T E R S			
	0	1000	3000	6000	0	1000	3000	6000
TOTAL VARIATIONS								
NUMBER WITH EXTERNAL VARIATIONS	9	3	10	15	7	3	7	8
PERCENT WITH EXTERNAL VARIATIONS	4.9	2.7	6.1	10.1	33.3	18.7	35.0	40.0
NUMBER WITH SOFT TISSUE VARIATIONS	25	18	37	23	12	10	16	15
PERCENT WITH SOFT TISSUE VARIATIONS	13.5	16.4	22.4	15.5	57.1	62.5	80.0	75.0
NUMBER WITH SKELETAL VARIATIONS	74	43	68	72	21	15	19	20
PERCENT WITH SKELETAL VARIATIONS	86.0	84.3	89.5	100.0	100.0	93.7	95.0	100.0
TOTAL NUMBER WITH VARIATIONS	99	60	103	94	21	15	20	20
TOTAL PERCENT WITH VARIATIONS	53.5	54.5	62.4	63.5	100.0	93.7	100.0	100.0

None significantly different from control

^a For all findings, the number (of fetuses affected or litters with one or more affected fetuses) is presented on top and the percentage of the total (fetuses or litters) examined is presented beneath. A single fetus may be represented more than once in listing individual defects. Only live fetuses were examined.

^b All fetuses were examined externally.

^c All fetuses were examined visceraally (Staples, 1974), and approximately 50% of each litter were examined for soft tissue craniofacial defects (Wilson, 1965; van Julsingha and Bennett, 1977).

^d Approximately 50% of each litter were examined for skeletal defects after staining with alizarin red S.



BUSHY RUN RESEARCH CENTER

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GOOD LABORATORY PRACTICES COMPLIANCE

This study was performed in full compliance with the Good Laboratory Practices (GLP) Standards promulgated by the U. S. Environmental Protection Agency Toxic Substances Control [Federal Register 48(230), 53922-53944, 1983].

Prepared by:



R. W. Tyl, Ph.D., DABT
Study Director

Date

PATH/esk/0949P-1
03-23-87

SL 042603

Bushy Run Research Center
A Joint Mellon Institute—Union Carbide Corporation Operation



BUSHY RUN RESEARCH CENTER

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Quality Assurance Unit Study Inspection Summary

Test Substance: 1,1,1 Trichloroethane

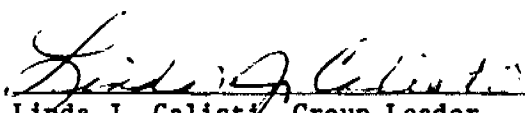
Study: Developmental Toxicity Study of Inhaled
1,1,1 Trichloroethane in New Zealand White Rabbits

Study Director: R. W. Tyl, Ph.D., D.A.B.T.

The Quality Assurance Unit of BRRRC conducted the inspections listed below and reported the results to the study director and to management on the dates indicated. It is the practice of this Quality Assurance Unit to report the results of each inspection to both the study director and management.

<u>Date</u>	<u>Inspection Type</u>	<u>Date QAU Report Issued</u>	
		<u>To Study Director</u>	<u>To Management</u>
7-14-86	Protocol, Probe Study	7-17-86	7-18-86
7-15-86	Protocol, Full Study	7-17-86	7-18-86
7-31-86	Event-Animal Receipt, Probe Study	8-5-86	8-18-86
8-22-86	Event-Exposure, Probe Study	9-2-86	9-9-86
9-3-86	Event-Sacrifice, Probe Study	9-4-86	9-9-86
9-16-86	Protocol Amendment #1, Probe Study	9-16-86	9-16-86
9-23-86	Event-Animal Receipt, Full Study	9-30-86	10-31-86
10-7-86	Event-Mating, Full Study	10-9-86	10-31-86
10-15-86	Event-Exposure, Full Study	10-20-86	10-31-86
10-22-86	Protocol Amendment #1, Full Study	10-22-86	10-22-86
11-6-86	Event-Necropsy, Full Study	11-7-86	12-10-86
6-2-87 to 6-8-87	Raw Data and Reports, Probe and Full Studies	6-10-87	6-24-87

<u>Date</u>	<u>Inspection</u> <u>Type</u>	<u>Date OAU Report Issued</u>	
		<u>To Study Director</u>	<u>To Management</u>
6-8 to 6-10-87	Analytical Raw Data and Reports, Probe and Full Studies	6-10-87	6-23-87
6-24-87	Archives	6-24-87	6-24-87

 6/24/87
Linda J. Calisti, Group Leader Date
Good Laboratory Practices/Quality Assurance

APPENDIX 1

Inhalation Chamber Operation and Analyses

(28 Pages)

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Appendix 1B Methodology and Inhalation Chamber Operation - Definitive Study.	1-5
Appendix 1C Analytical Report - Exposure Range-Finding Study	1-9
Appendix 1D Methodology and Inhalation Chamber Operation - Exposure Range-Finding Study.	1-5

APPENDIX 1A

Analytical Report
Definitive Study

(9 Pages)

APPENDIX 1A

Chemical and Chamber Atmosphere Analyses
for the Developmental Toxicity Study of Inhaled
1,1,1-Trichloroethane in CD® Rats and in New Zealand White Rabbits

SUMMARY

The concentrations of 1,1,1-trichloroethane (TCE) in the exposure chambers were monitored throughout the 16 days of exposure by gas chromatography. The concentration in each chamber was determined approximately 13 times during each 6-hour exposure. The overall means ($\pm$ standard deviations) were 1017 ($\pm$ 18), 3122 ($\pm$ 39), and 5906 ($\pm$ 45) ppm for target concentrations of 1000, 3000, and 6000 ppm, respectively. No TCE concentration above the estimated minimum detection limit was detected in the control chamber. The test chemical was analyzed before and after the study; no significant compositional changes were detected.

CHEMICALS

Three 55-gallon containers of 1,1,1-trichloroethane (TCE) test material (CAS Number 71-55-6, Lot Number TA8 606182, BRRC Sample Number 49-228 A,B,C) were received from The Dow Chemical Company (Freeport, TX) on June 25, 1986. Test material from the original container was placed in one-gallon glass bottles and blanketed with nitrogen. The chemical and physical properties of the test material are described in Table 1. The purity and stability were verified by analysis both before and after the study. These analyses, provided by Mr. William D. Tasto, Dow Chemical USA, are presented in Table 2. No significant compositional changes occurred while the study progressed. The test material remained 99.9% pure throughout the study.

The gases for the chromatograph were obtained from Linde Corporation. The nitrogen and hydrogen were Ultra High Purity grade and the air was breathing quality.

EQUIPMENT

A Perkin-Elmer Model 3920B gas chromatograph (GC) equipped with a flame ionization detector was used to monitor the TCE vapor concentrations in the chambers. The GC operating parameters are presented in Table 3. A Spectra-Physics series 4000 central processor, a data interface, and a Perkin-Elmer automatic gas sampling system (station and valve programmer units and a gas sampling valve) were used for the analyses. The chromatogram and chromatographic data were printed on a printer/plotter providing a permanent record of the analyses. The chromatographic data were also transmitted to a Hewlett-Packard Model 2640 B terminal and to a Digital PDP 1170 computer with a RSX 11 M+ operating system. The computer software provided statistical treatment of the data and also triggered an alarm if an exposure chamber concentration deviated more than 10% from the target concentration.

CALIBRATION

Calibration of the gas chromatograph was achieved by injecting gas standards, which were prepared by syringe injection of test material into Tedlar® gas bags. These standards were prepared using the mathematical relationship:

$$V = \frac{C \times V_h \times MW \times 298 \times P}{d \times 24.45 \times T \times 760} \times 10^{-6}$$

where: V = required volume of calibration liquid in milliliters (mL) at temperature T in degrees Kelvin (°K)

C = the desired final calibration concentration in parts per million (ppm)

V_h = volume of container (Liters)

MW = molecular weight of the calibration liquid

P = barometric pressure in millimeters of mercury (mm Hg)

d = density of calibration liquid in grams per milliliter (g/mL) at temperature T

24.45 = molecular volume at 298°K and 760 mm Hg, in (Liters)

T = temperature in degrees Kelvin (°K)

A linear calibration curve (Figure 1) was obtained when areas (integration counts) were plotted versus the gas standard concentrations. The calibration factor (KF) was calculated as:

$$KF = \frac{AREA}{CONCENTRATION}$$

The mean KF for all valid injections of standards was used in subsequent microprocessor calculations. This calibration factor was checked at least once each week during the exposure period and did not require adjustment.

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CHAMBER ATMOSPHERE ANALYSIS

Each chamber atmosphere was analyzed for TCE approximately once every 25 minutes during each 6-hour exposure. The daily mean concentrations are listed in Table 4. The means of daily means ($\pm$ standard deviation) were 1017 ($\pm$ 18), 3122 ($\pm$ 39), and 5906 ($\pm$ 45) ppm, for target concentrations of 1000, 3000, and 6000 ppm, respectively. No concentration of TCE above the estimated minimum detection limit of 10 ppm was found in the control chamber during the study.

The daily analytical/nominal TCE concentration ratios are given in Table 5; the nominal concentration being an estimate calculated from the quantity of test material delivered and the chamber airflow rate. The overall mean analytical/nominal concentration ratios were 0.90, 0.96, and 0.90 for the 1000 ppm, 3000 ppm, and 6000 ppm exposure concentrations, respectively.

Acknowledgement:

John M. Smith, B.S.

Technical Assistance

Irvin M. Pritts

6-23-87

Irvin M. Pritts, Ph.D.
Research Scientist

Date

WPC/11f/1189Z-1
06-23-87

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Table 1

Chemical and Physical Properties of 1,1,1-Trichloroethane¹

Syn nyms:	Methyl Chloroform
Boiling Point:	74°C
Specific Gravity @ 25/25°C:	1.330-1.335
Vapor Density:	4.55
Appearance and Odor:	Colorless liquid; irritating odor at high concentrations
Vapor Pressure @ 20°C:	100 mm Hg
Solubility in Water:	0.07 g/100 g @ 25°C
Flash Point:	None

¹Material Safety Data Sheet, Dow Chemical U.S.A., MSDS:000699, 6/21/86.

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06-23-87

Table 2
Test Material Analysis¹

	Pre-Study	Post-Study
GC Purity	> 99.9 wt%	> 99.9 wt%
Chloroethylene	0.0009 wt%	0.0004 wt%
1,1-dichloroethylene	0.0355 wt%	0.0400 wt%
1,1-dichloroethane	0.0029 wt%	0.0021 wt%
1,2-dichloroethane	0.0050 wt%	0.0040 wt%
1,2-epoxybutane	0.0284 wt%	0.0270 wt%
Water Content	35 ppm	62 ppm
Acidity (as HCl)	4.8 ppm	2.3 ppm
Color, APHA	0 (Pt.-Co.)	0 (Pt.-Co.)
Non-Volatile Residue	4.5 ppm	3.8 ppm
Infrared Scan	Typical	Typical (no change)

¹Analyses provided by Mr. William D. Tasto, Dow Chemical U.S.A., on September 18, 1986 and on November 12, 1986.

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Table 3

Gas Chromatograph Operating Parameters

Chromatograph:	Perkin-Elmer 3920
Detector:	Flame Ionization
Column:	10% SP-2100 on 80/100 mesh Supelcoport® (10 ft. x 1/8 in. stainless steel)
Column temperature:	125°C
Injector temperature:	Ambient gas sample valve
Detector temperature:	250°C
Carrier flow rate:	15 mL/minute nitrogen
Hydrogen flow rate:	66 mL/minute
Air flow rate:	303 mL/minute
Sample size:	1 cc
Retention time:	90 seconds
GC attenuation:	100 x 2
Printer/Plotter attenuation:	50
Chart speed:	1 cm/minute
Approximate minimum detection limit:	10 ppm

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06-23-87

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Table 4

Summary of Daily Mean Chamber Concentrations

Exposure Day	Target Concentration, ppm			
	1000	3000	6000	0
Daily Mean Concentrations (ppm) $\pm$ SD ¹				
1	1041 $\pm$ 17.7	3132 $\pm$ 49.5	5986 $\pm$ 83.1	< MDL ²
2	1035 $\pm$ 53.2	3118 $\pm$ 30.3	5943 $\pm$ 40.4	< MDL
3	1042 $\pm$ 16.8	3178 $\pm$ 16.8	5964 $\pm$ 35.4	< MDL
4	1033 $\pm$ 8.2	3167 $\pm$ 17.6	5941 $\pm$ 41.9	< MDL
5	1031 $\pm$ 13.3	3202 $\pm$ 11.5	5925 $\pm$ 181.3	< MDL
6	1014 $\pm$ 23.9	3094 $\pm$ 40.6	5880 $\pm$ 93.0	< MDL
7	1017 $\pm$ 6.1	3093 $\pm$ 29.9	5885 $\pm$ 98.5	< MDL
8	1031 $\pm$ 17.3	3050 $\pm$ 25.5	5867 $\pm$ 30.6	< MDL
9	990 $\pm$ 8.8	3075 $\pm$ 50.3	5886 $\pm$ 112.9	< MDL
10	986 $\pm$ 19.5	3119 $\pm$ 16.5	5803 $\pm$ 266.3	< MDL
11	1019 $\pm$ 21.7	3120 $\pm$ 17.5	5934 $\pm$ 32.6	< MDL
12	1010 $\pm$ 60.9	3149 $\pm$ 42.3	5927 $\pm$ 45.1	< MDL
13	1019 $\pm$ 7.7	3116 $\pm$ 16.5	5910 $\pm$ 88.7	< MDL
14	1010 $\pm$ 30.2	3101 $\pm$ 10.2	5888 $\pm$ 51.8	< MDL
15	1008 $\pm$ 5.1	3136 $\pm$ 18.1	5892 $\pm$ 97.1	< MDL
16	992 $\pm$ 20.8	3107 $\pm$ 44.8	5857 $\pm$ 183.9	< MDL
Mean of Daily Means	1017	3122	5906	< MDL
Standard Deviation	17.7	38.6	45.1	-

¹SD = Standard deviation

²< MDL = Less than the estimated minimum detection limit.

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Table 5

Analytical to Nominal Concentration Ratios

Exposure Day	Target Concentration								
	1000 ppm			3000 ppm			6000 ppm		
	Analytical ¹	Nominal	A/N ²	Analytical	Nominal	A/N	Analytical	Nominal	A/N
1	1041	1131	0.92	3132	3179	0.99	5986	6543	0.91
2	1035	1141	0.91	3118	3180	0.98	5943	6487	0.92
3	1042	1148	0.91	3178	3252	0.98	5964	6547	0.91
4	1033	1129	0.91	3167	3261	0.97	5941	6553	0.91
5	1031	1120	0.92	3202	3224	0.99	5925	6520	0.91
6	1014	1145	0.89	3094	3224	0.96	5880	6546	0.90
7	1017	1127	0.90	3093	3235	0.96	5885	6536	0.90
8	1031	1152	0.89	3050	3228	0.94	5867	6525	0.90
9	990	1110	0.89	3075	3168	0.97	5886	6421	0.92
10	986	1109	0.89	3119	3275	0.95	5803	6588	0.88
11	1019	1141	0.89	3120	3252	0.96	5934	6567	0.90
12	1010	1150	0.88	3149	3270	0.96	5927	6592	0.90
13	1019	1145	0.89	3116	3258	0.96	5910	6574	0.90
14	1010	1138	0.89	3101	3270	0.95	5888	6560	0.90
15	1008	1146	0.88	3136	3252	0.96	5892	6546	0.90
16	992	1113	0.89	3107	3224	0.96	5857	6438	0.91
Mean of Daily Means	1017	1134	0.90	3122	3234	0.96	5906	6534	0.90
Standard Deviation	17.7	14.6	0.013	38.6	33.8	0.014	45.1	48.3	0.0096

¹Daily mean concentration (ppm)²Analytical/nominal concentration ratioWPC/11f/1189Z-1,
06-23-87

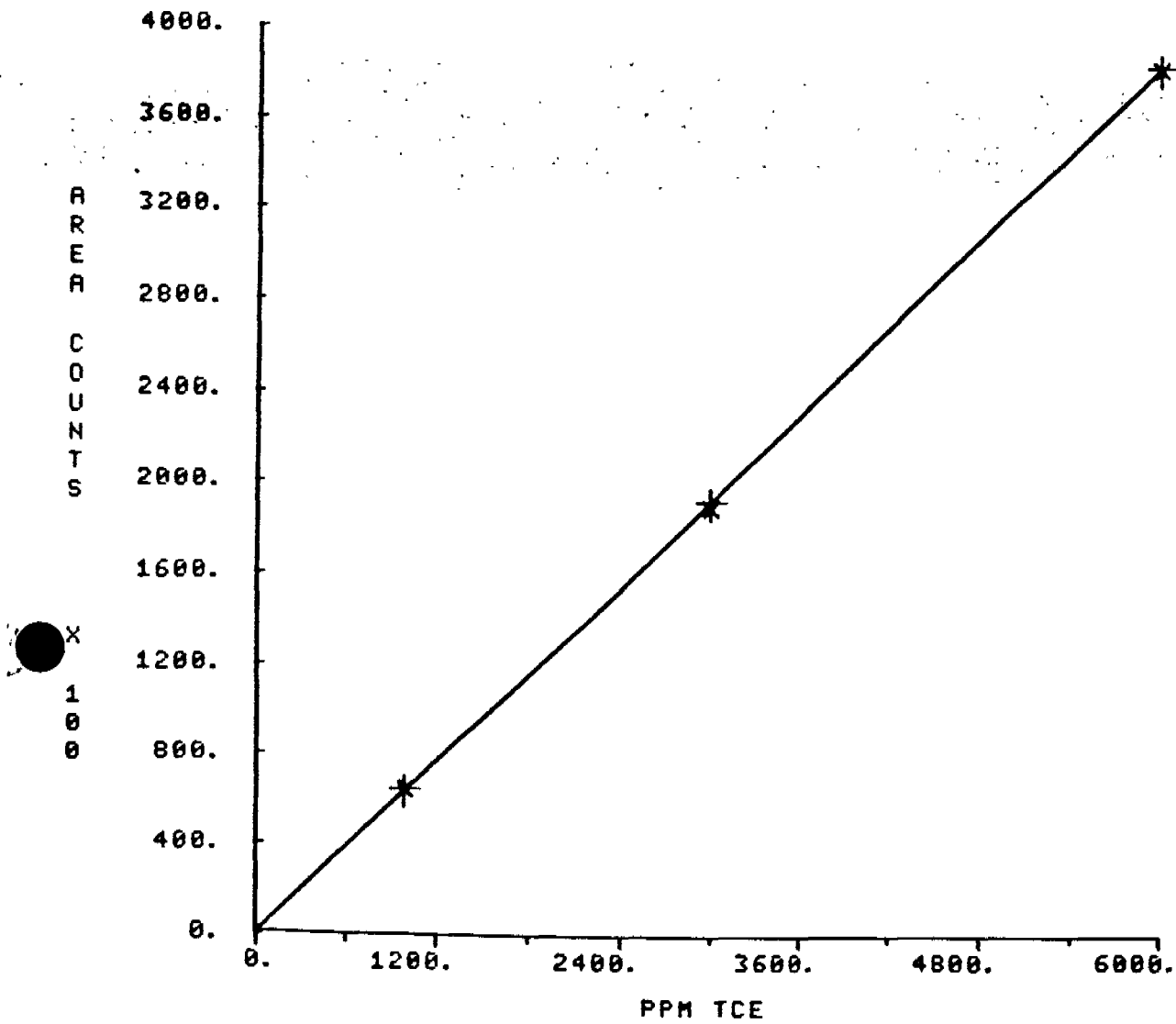


Figure 1. Calibration Curve

APPENDIX 1B

Methodology and Inhalation Chamber Operation
1,1,1-Trichloroethane Vapor Inhalation
Definitive Study

(5 Pages)

APPENDIX 1BMethodology and Inhalation Chamber Operation
1,1,1-Trichloroethane Vapor Inhalation
Teratology Full StudyMETHODSInhalation Chamber Description and Operation

The inhalation chambers used in this study were located in Room 139. They were constructed from stainless-steel with glass windows for animal observation (Table 1). Chamber volume was approximately 4320 liters and airflow was 1000 L/min (14 air changes per hour). Chamber temperature and relative humidity were recorded using minimum-maximum thermometers (Abbeon Cal, Inc., Santa Barbara, CA and Brooklyn Thermometer Company, Inc., Farmingdale, NY) and an Airguide Humidity Indicator (Airguide Instrument Company, Chicago, IL), respectively. Temperature and relative humidity measurements were recorded eleven times per exposure.

1,1,1-Trichloroethane Vapor Generation

Liquid 1,1,1-trichloroethane was metered from a piston pump (Fluid Metering Inc., Oyster Bay, NY) for all target chamber concentrations into a heated glass evaporator similar in design as that described by Carpenter et. al. (Toxicol. Appl. Pharmacol. 32:246-262, 1975). Two evaporators were set-up in series for the 6000 ppm target concentration. This was necessary because of the large volume of test material needed to generate the high level concentration. The temperature in the evaporators were maintained at the lowest level sufficient to vaporize the liquid. The resultant vapor was carried into the chamber by a countercurrent air stream that entered the bottom of the evaporator. Temperature measurements were obtained from the airstream of each evaporator during the exposure regimen. The temperature was measured by using a Doric Trendicator Model 400A probe (Doric Scientific Division, Emerson Electric Co., San Diego, CA).

RESULTSChamber Temperature and Relative Humidity

During exposures, the mean of daily mean chamber temperatures for all exposure groups ranged from 24.9 to 25.3°C (Table 2), and the relative humidity ranged between 41.4 to 49.7% (Table 3).

Evaporator Temperature

The temperature for all evaporators ranged from 35 to 64°C.

-2-

Acknowledgements

David W. Fait, B.S., AALAS Cert. II Master Technologist

William J. Kintigh 6/22/87
William J. Kintigh, B.S. Date
AALAS Cert. I
Master Technologist

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03-17-87

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Table 1

1,1,1-Trichloroethane Vapor Inhalation
Teratology Full Study
Inhalation Chamber Design and Operation

CHAMBER

Location: Room 139

Construction: The chamber is made of stainless-steel. The door in the front of the chamber and the windows in one of the side walls (through which animals were observed) were made of glass.

Shape: Rectangular

Dimensions: Height - 207 cm
Length - 213 cm
Width - 98 cm
Total Volume - Approximately 4320 Liters

Manufacturer: Wahmann Manufacturing Company
Timonium, Maryland

Airflow Measurement: An orifice plate was positioned in the exhaust duct of the chamber and was connected to a Dwyer Magnehelic® pressure gauge.

Airflow: For all exposure groups:
1000 liters/min $t_{99}^* = 20$ min.

* t_{99} is the theoretically-derived time required for the chamber to reach 99% of the equilibrium concentration.

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Table 2

1,1,1-Trichloroethane Vapor Inhalation Teratology Full Study
Chamber Temperature (°C)

<u>Exposure Day</u>	<u>Target Chamber Concentrations</u>			
	<u>6000 ppm</u>	<u>3000 ppm</u>	<u>1000 ppm</u>	<u>0 ppm</u>
1	26.9*	24.9	24.9	25.4
2	25.5	24.3	24.5	24.2
3	26.3	26.5	26.5	26.2
4	26.1	25.9	26.1	25.7
5	25.5	26.0	26.1	25.8
6	25.6	25.7	26.1	25.7
7	26.0	26.3	26.4	26.4
8	25.2	24.8	25.5	25.6
9	26.1	25.8	26.3	26.3
10	24.7	24.6	25.1	24.9
11	24.7	24.1	24.5	24.4
12	25.2	24.5	24.8	25.3
13	25.1	24.2	25.0	25.2
14	23.8	23.8	24.1	23.7
15	24.5	23.7	22.9	23.5
16	23.6	22.5	22.2	22.7
Mean of Daily Means	25.3	24.9	25.1	25.1
Standard Deviation	0.90	1.10	1.25	1.08

* Each value represents the mean of 11 measurements taken during each six-hour exposure.

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Table 3

1,1,1-Trichloroethane Vapor Inhalation Teratology Full Study
Chamber Relative Humidity (%)

<u>Exposure Day</u>	<u>Target Chamber Concentrations</u>			
	<u>6000 ppm</u>	<u>3000 ppm</u>	<u>1000 ppm</u>	<u>0 ppm</u>
1	34.1*	40.5	41.0	55.4
2	38.7	47.4	42.4	50.3
3	38.1	37.7	35.5	45.0
4	37.8	38.6	38.2	46.5
5	40.8	40.9	40.5	46.8
6	42.0	45.2	42.7	49.9
7	37.5	39.8	41.3	44.6
8	37.6	39.9	40.5	45.0
9	41.3	45.2	48.8	51.4
10	45.5	45.9	50.2	50.7
11	46.3	50.8	51.3	53.2
12	44.5	49.6	48.2	51.4
13	44.7	47.5	46.4	51.1
14	45.5	48.3	46.5	52.0
15	44.5	48.6	49.4	51.0
16	44.1	48.1	48.4	51.2
Mean of Daily Means	41.4	44.6	44.5	49.7
Standard Deviation	3.74	4.35	4.76	3.18

* Each value represents the mean of 11 measurements taken during each six-hour exposure.

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APPENDIX 1C

Analytical Report
Exposure Range-Finding Study

(9 Pages)

APPENDIX 1C

Chemical and Chamber Atmosphere Analyses
for the Developmental Toxicity Exposure Range-Finding Study
of Inhaled 1,1,1-Trichloroethane in CD® Rats and
New Zealand White Rabbits

SUMMARY

The concentrations of 1,1,1-trichloroethane (TCE) in the exposure chambers were monitored throughout the 14 days of exposure by gas chromatography. The concentration in each chamber was determined approximately 13 times during each 6-hour exposure. The overall means ($\pm$ standard deviations) were 1011 ($\pm$ 18), 3019 ($\pm$ 161), and 5907 ($\pm$ 126) ppm for target concentrations of 1000, 3000, and 6000 ppm, respectively. No TCE above the estimated minimum detection limit of 10 ppm was detected in the control chamber. The test chemical was analyzed before and after the study; no significant compositional changes were detected.

CHEMICALS

Three 55-gallon containers of 1,1,1-trichloroethane (TCE) test material (CAS Number 71-55-6, Lot Number TA8 606182, BRRC Sample Number 49-228 A,B,C) were received from The Dow Chemical Company (Freeport, TX) on June 25, 1986. Test material from the original container was placed in one-gallon glass bottles and blanketed with nitrogen. The chemical and physical properties of the test material are described in Table 1. The purity and stability were verified by analysis both before and after the study. These analyses, provided by Mr. William D. Tasto, Dow Chemical USA, are presented in Table 2. No significant compositional changes occurred while the study progressed. The test material remained 99.9% pure throughout the study.

The gases for the chromatograph were obtained from Linde Corporation. The nitrogen and hydrogen were Ultra High Purity grade and the air was breathing quality.

EQUIPMENT

A Perkin-Elmer Model 3920B gas chromatograph (GC) equipped with a flame ionization detector was used to monitor the TCE vapor concentrations in the chambers. The GC operating parameters are presented in Table 3. A Spectra-Physics series 4000 central processor, a data interface, and a Perkin-Elmer automatic gas sampling system (station and valve programmer units and a gas sampling valve) were used for the analyses. The chromatogram and chromatographic data were printed on a printer/plotter providing a permanent record of the analyses. The chromatographic data were also transmitted to a Hewlett-Packard Model 2640 B terminal and to a Digital PDP 1170 computer with a RSX 11 M+ operating system. The computer software provided statistical treatment of the data and also triggered an alarm if an exposure chamber concentration deviated more than 10% from the target concentration.

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CALIBRATION

Calibration of the gas chromatograph was achieved by injecting gas standards, which were prepared by syringe injection of test material into Tedlar® gas bags. These standards were prepared using the mathematical relationship:

$$V = \frac{C \times V_h \times MW \times 298 \times P}{d \times 24.45 \times T \times 760} \times 10^{-6}$$

where: V = required volume of calibration liquid in milliliters (mL) at temperature T in degrees Kelvin (°K)

C = the desired final calibration concentration in parts per million (ppm)

V_h = volume of container (Liters)

MW = molecular weight of the calibration liquid

P = barometric pressure in millimeters of mercury (mm Hg)

d = density of calibration liquid in grams per milliliter (g/mL) at temperature T

24.45 = molecular volume at 298°K and 760 mm Hg, in (Liters)

T = temperature in degrees Kelvin (°K)

A linear calibration curve (Figure 1) was obtained when areas (integration counts) were plotted versus the gas standard concentrations. The calibration factor (KF) was calculated as:

$$KF = \frac{AREA}{CONCENTRATION}$$

The mean KF for all valid injections of standards was used in subsequent microprocessor calculations. This calibration factor was checked at least once each week during the exposure period and did not require adjustment.

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CHAMBER ATMOSPHERE ANALYSIS

Each chamber atmosphere was analyzed for TCE approximately once every 25 minutes during each 6-hour exposure. The daily mean concentrations are listed in Table 4. The means of daily means ($\pm$ standard deviation) were 1011 ($\pm$ 18), 3019 ($\pm$ 161), and 5907 ($\pm$ 126) ppm, for target concentrations of 1000, 3000, 6000 ppm, respectively. No concentration of TCE above the estimated minimum detection limit of 10 ppm was found in the control chamber during the study.

The daily analytical/nominal TCE concentration ratios are given in Table 5; the nominal concentration being an estimate calculated from the quantity of test material delivered and the chamber airflow rate. The overall mean analytical/nominal concentration ratios were 0.91, 0.99, and 0.90 for the 1000 ppm, 3000 ppm, and 6000 ppm exposure concentrations, respectively.

The low daily mean chamber concentration and large standard deviation (2540 ppm $\pm$ 1113) for the 3000 ppm target concentration for day 13 (Table 4) was caused by a vapor generation problem. As a result, test animals were exposed to less than 60 ppm TCE for nearly one hour of the 6-hour exposure. The other 5 hours of exposure proceeded normally.

Acknowledgement:

John M. Smith, B.S.

Technical Assistance

Irvin M. Pritts

6-23-87

Irvin M. Pritts, Ph.D.
Research Scientist

Date

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06-23-87

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Table 1

Chemical and Physical Properties of 1,1,1-Trichloroethane¹

Synonyms:	Methyl Chloroform
Boiling Point:	74°C
Specific Gravity @ 25/25°C:	1.330-1.335
Vapor Density:	4.55
Appearance and Odor:	Colorless liquid; Irritating odor at high concentrations
Vapor Pressure @ 20°C:	100 mm Hg
Solubility in Water:	0.07 g/100 g @ 25°C
Flash Point:	None

¹Material Safety Data Sheet, Dow Chemical U.S.A., MSDS:000699, 6/21/86.

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Table 2

Test Material Analysis¹

	Pre-Study	Post-Study
GC Purity	> 99.9 wt%	> 99.9 wt%
Chloroethylene	0.0026 wt%	0.0009 wt%
1,1-dichloroethylene	0.0340 wt%	0.0355 wt%
1,1-dichloroethane	0.0040 wt%	0.0029 wt%
1,2-dichloroethane	0.0045 wt%	0.0050 wt%
1,2-epoxy butane	0.0281 wt%	0.0284 wt%
Water Content	26 ppm	35 ppm
Acidity (as HCl)	1.8 ppm	4.8 ppm
Color, APHA	0 (Pt.-Co.)	0 (Pt.-Co.)
Non-Volatile Residue	3.9 ppm	4.5 ppm
Infrared Scan	Typical	Unchanged (typical)

¹Analyses provided by Mr. William D. Tasto, Dow Chemical U.S.A. on July 23, 1986 and on September 18, 1986.

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Table 3

Gas Chromatograph Operating Parameters

Chromatograph:	Perkin-Elmer 3920
Detector:	Flame Ionization
Column:	10% SP-2100 on 80/100 mesh Supelcoport® (10 ft. x 1/8 in. stainless steel)
Column temperature:	125°C
Injector temperature:	Ambient gas sample valve
Detector temperature:	250°C
Carrier flow rate:	15 mL/minute nitrogen
Hydrogen flow rate:	66 mL/minute
Air flow rate:	303 mL/minute
Sample size:	1 cc
Retention time:	90 seconds
GC attenuation:	100 x 2
Printer/Plotter attenuation:	50
Chart speed:	1 cm/minute
Approximate minimum detection limit:	10 ppm

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Table 4
Summary of Daily Mean Chamber Concentrations

Exposure Day	Target Concentration, ppm			
	1000	3000	6000	0
	<u>Daily Mean Concentrations (ppm) $\pm$ SD¹</u>			
1	993 $\pm$ 51.9	3236 $\pm$ 38.8	6057 $\pm$ 154.5	< MDL
2	998 $\pm$ 47.6	3092 $\pm$ 34.3	5934 $\pm$ 46.2	< MDL
3	1007 $\pm$ 6.9	3169 $\pm$ 105.0	5945 $\pm$ 254.5	< MDL
4	1002 $\pm$ 30.6	3054 $\pm$ 24.3	5994 $\pm$ 27.4	< MDL
5	1011 $\pm$ 19.5	3154 $\pm$ 61.1	5893 $\pm$ 372.8	< MDL
6	1017 $\pm$ 19.0	3051 $\pm$ 120.1	5923 $\pm$ 162.3	< MDL
7	1011 $\pm$ 19.5	3000 $\pm$ 78.3	5873 $\pm$ 148.5	< MDL
8	999 $\pm$ 34.9	3000 $\pm$ 31.7	6013 $\pm$ 154.1	< MDL
9	978 $\pm$ 23.5	3045 $\pm$ 11.4	5825 $\pm$ 379.8	< MDL
10	1006 $\pm$ 13.1	3021 $\pm$ 13.5	5895 $\pm$ 145.0	< MDL
11	1035 $\pm$ 27.9	2913 $\pm$ 174.9	5779 $\pm$ 115.1	< MDL
12	1038 $\pm$ 9.0	2986 $\pm$ 40.7	5588 $\pm$ 508.0	< MDL
13	1039 $\pm$ 15.5	2540 $\pm$ 1113	5881 $\pm$ 86.0	< MDL
14	1024 $\pm$ 9.6	3004 $\pm$ 12.9	6097 $\pm$ 18.5	< MDL
Mean of Daily Means	1011	3019	5907	< MDL
Standard Deviation	17.8	161.4	126.1	-

¹SD = Standard deviation

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Table 5

Analytical to Nominal Concentration Ratios

Exposure Day	Target Concentration								
	1000 ppm			3000 ppm			6000 ppm		
	Analytical ¹	Nominal	A/N ²	Analytical	Nominal	A/N	Analytical	Nominal	A/N
1	993	1113	0.89	3236	3224	1.00	6057	6552	0.92
2	998	1106	0.90	3092	3104	1.00	5934	6553	0.91
3	1007	1124	0.90	3169	3249	0.98	5945	6609	0.90
4	1002	1117	0.90	3054	3046	1.00	5994	6477	0.93
5	1011	1101	0.92	3154	3104	1.02	5893	6546	0.90
6	1017	1113	0.91	3051	3086	0.99	5923	6546	0.90
7	1011	1120	0.90	3000	3023	0.99	5873	6525	0.90
8	999	1099	0.91	3000	2995	1.00	6013	6506	0.92
9	978	1082	0.90	3045	3048	1.00	5825	6485	0.90
10	1006	1106	0.91	3021	3028	1.00	5895	6560	0.90
11	1035	1125	0.92	2913	2966	0.98	5779	6574	0.88
12	1038	1111	0.93	2986	3038	0.98	5588	6508	0.86
13	1039	1110	0.94	2540	2752	0.92	5881	6525	0.90
14	1024	1101	0.93	3004	3022	0.99	6097	6567	0.93
Mean of Daily Means	1011	1109	0.91	3019	3049	0.99	5907	6538	0.90
Standard Deviation	17.8	11.4	0.015	161.4	117.0	0.023	126.1	36.1	0.019

¹Daily mean concentration (ppm)²Analytical/nominal concentration ratioWPC/11f/1189Z-1
06-23-87

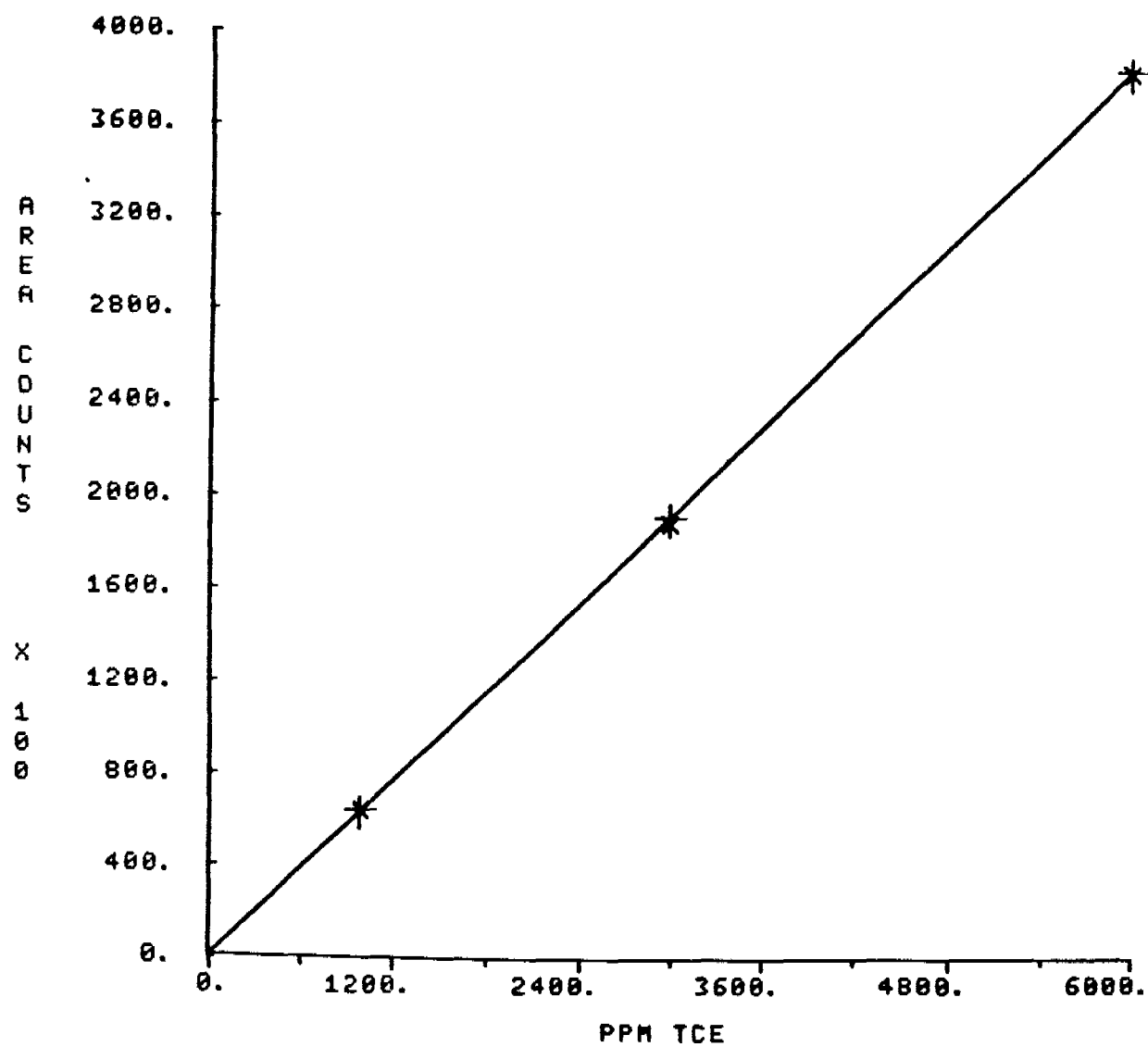


Figure 1. Calibration Curve

APPENDIX 1D

Methodology and Inhalation Chamber Operation
1,1,1-Trichloroethane Vapor Inhalation
Exposure Range-Finding Study

(5 Pages)

APPENDIX 1DMethodology and Inhalation Chamber Operation
1,1,1-Trichloroethane Vapor Inhalation
Teratology Probe StudyMETHODSInhalation Chamber Description and Operation

The inhalation chambers used in this study were located in Room 139. They were constructed from stainless-steel with glass windows for animal observation (Table 1). Chamber volume was approximately 4320 liters and airflow was 1000 L/min (14 air changes per hour). Chamber temperature and relative humidity were recorded using minimum-maximum thermometers (Abbeon Cal, Inc., Santa Barbara, CA and Brooklyn Thermometer Company, Inc., Farmingdale, NY) and an Airguide Humidity Indicator (Airguide Instrument Company, Chicago, IL), respectively. Temperature and relative humidity measurements were recorded at least ten (10) times per exposure.

1,1,1 - Trichloroethane Vapor Generation

Liquid 1,1,1-trichloroethane was metered from a piston pump (Fluid Metering Inc., Oyster Bay, NY) for the 6000, 3000, and 1000 ppm target chamber concentrations into a heated glass evaporator similar in design as that described by Carpenter *et. al.* (*Toxicol. Appl. Pharmacol.* 32:246-262, 1975). Two evaporators were set-up in series for the 6000 ppm target concentration. This was necessary because of the large volume of test material needed to generate the high level concentration. The temperature in the evaporators were maintained at the lowest level sufficient to vaporize the liquid. The resultant vapor was carried into the chamber by a countercurrent air stream that entered the bottom of the evaporator. Temperature measurements were obtained from the airstream of each evaporator during the exposure regimen. The temperature was measured by using a Doric Trendicator Model 400A probe (Doric Scientific Division, Emerson Electric Co., San Diego, CA).

RESULTSChamber Temperature and Relative Humidity

During exposures, the mean of daily mean chamber temperatures for all exposure groups ranged from 20.3 to 24.5°C (Table 2), and the relative humidity ranged between 38.5 to 49.6% (Table 3).

Evaporator Temperature

The temperature for all evaporators ranged from 28 to 41°C.

-2-

Acknowledgements

David W. Falt, B.S., AALAS Cert. II	Master Technologist
Frank L. Howard, III, AALAS Cert. II	Master Technologist

<u>William J. Kintigh</u>	<u>6/25/87</u>
William J. Kintigh, B.S.	Date
AALAS Cert. I	
Master Technologist	

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03-07-87

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Table 1

1,1,1-Trichloroethane Vapor Inhalation
Teratology Probe Study
Inhalation Chamber Design and Operation

CHAMBER

Location: Room 139

Construction: The chamber is made of stainless-steel. The door in the front of the chamber and the windows in one of the side walls (through which animals were observed) were made of glass.

Shape: Rectangular

Dimensions: Height - 207 cm
Length - 213 cm
Width - 98 cm
Total Volume - Approximately 4320 Liters

Manufacturer: Wahmann Manufacturing Company
Timonium, Maryland

Airflow Measurement: An orifice plate was positioned in the exhaust duct of the chamber and was connected to a Dwyer Magnehelic® pressure gauge.

Airflow: For all exposure groups:
1000 liters/min $t_{99}^* = 20$ min.

* t_{99} is the theoretically-derived time required for the chamber to reach 99% of the equilibrium concentration.

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03-17-87

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Table 2

1,1,1-Trichloroethane Vapor Inhalation Teratology Probe Study
Chamber Temperature (°C)

<u>Exposure Day</u>	<u>Target Chamber Concentrations</u>			
	<u>6000 ppm</u>	<u>3000 ppm</u>	<u>1000 ppm</u>	<u>0 ppm</u>
1	25.6*	22.0	21.2	23.0
2	25.5	21.9	21.0	21.5
3	25.2	21.8	21.0	21.0
4	25.7	21.6	20.8	21.0
5	24.7	21.0	20.5	21.0
6	25.4	21.4	20.6	19.0
7	25.5	21.4	21.0	18.8
8	24.3	21.6	20.8	19.2
9	23.8	20.3	20.5	19.5
10	23.5	20.4	21.0	19.5
11	24.6	21.6	21.1	20.3
12	23.5	21.4	20.4	20.6
13	23.0	**	20.0	20.0
14	23.3	20.7	19.7	19.9
Mean of Daily Means	24.5	21.3	20.7	20.3
Standard Deviation	0.97	0.55	0.43	1.14

* Each value represents the mean of at least 10 measurements taken during each six-hour exposure.

** Generator technician unable to see temperature gauge.

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Table 3

1,1,1-Trichloroethane Vapor Inhalation Teratology Probe Study
Chamber Relative Humidity (%)

<u>Exposure Day</u>	<u>Target Chamber Concentrations</u>			
	<u>6000 ppm</u>	<u>3000 ppm</u>	<u>1000 ppm</u>	<u>0 ppm</u>
1	36.5*	54.6	52.2	55.0
2	43.5	53.1	53.1	55.5
3	33.1	46.9	47.0	50.5
4	38.4	47.0	46.5	50.0
5	41.8	49.0	48.7	51.5
6	41.6	48.4	48.2	50.8
7	37.1	45.6	45.9	48.3
8	36.3	46.3	45.4	48.8
9	36.8	45.5	45.9	46.8
10	35.5	45.5	47.5	46.0
11	36.6	47.2	48.2	45.9
12	41.5	50.4	49.1	46.9
13	40.3	51.2	51.0	50.1
14	40.2	51.9	50.6	48.2
Mean of Daily Means	38.5	48.8	48.5	49.6
Standard Deviation	2.49	3.01	2.43	2.99

* Each value represents the mean of at least 10 measurements taken during each six-hour exposure.

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03-17-87

APPENDIX 2

Individual In-Life Maternal Data

(9 Pages)

SL 042639

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
INDIVIDUAL BODY WEIGHTS (GRAMS) DURING GESTATION

PREGNANCY STATUS		DAY 0	6	9	12	15	19	29
DAMS FROM GROUP 1:		G - 0 PPM						
15946	G	3592.5	3916.6	3870.6	3948.2	3992.6	4064.6	4309.7
15953	G	3584.7	3801.9	3828.9	3793.3	3857.7	3823.8	4084.4
15954	G	3339.0	3487.8	3424.0	3429.4	3435.0	3456.5	3723.4
15961	G	3499.4	3574.7	3488.6	3536.0	3524.4	3492.3	3717.6
15967	G	3756.4	3608.8	3636.8	3581.2	3530.0	3668.6	3831.3
15980	G	3647.8	3775.7	3705.9	3717.7	3766.4	3756.7	4017.1
15990	G	3658.5	3801.8	3774.7	3766.8	3735.4	3861.8	4027.5
15991	G	3352.7	3465.6	3456.7	3481.3	3614.2	3636.4	3903.8
15993	G	3833.0	3895.4	3913.4	3920.9	3996.2	4061.7	4321.4
15994	G	3507.0	3645.0	3685.2	3664.4	3715.9	3778.6	3988.0
15997	DE	3669.0	3808.9	3816.2	3767.0	3830.2	3811.3	3153.1
16002	NG	3250.4	3282.4	3303.7	3330.0	3405.6	3506.4	3676.1
16003	G	3430.3	3663.1	3580.7	3603.1	3674.1	3784.7	4011.1
16005	G	3159.7	3295.6	3190.0	3268.4	3357.1	3404.6	3705.3
16006	G	3464.9	3627.8	3653.9	3678.5	3732.7	3776.0	3890.5
16016	G	3641.4	3899.6	3907.8	3975.6	4108.9	4144.9	4353.1
16020	G	3279.0	3599.2	3639.3	3635.8	3729.2	3758.8	3874.4
16025	G	3515.3	3496.1	3492.0	3473.7	3528.1	3595.6	3814.8
16028	G	3353.9	3616.1	3593.4	3619.9	3699.4	3757.5	3941.7
16036	G	3399.7	3624.0	3556.6	3572.0	3590.5	3663.5	3876.1
16039	G	3189.8	3372.0	3363.0	3408.2	3519.6	3568.9	3771.7
16041	G	3143.8	3387.0	3213.1	3275.1	3242.0	3307.9	3519.5
16045	G	3149.3	3209.1	3179.5	3195.8	3355.0	3378.7	3430.0
16047	G	3454.3	3476.3	3480.3	3439.3	3403.2	3471.1	3640.7
MEAN		3461.8	3610.8	3584.8	3597.9	3649.5	3696.7	3865.5
S.D.		196.9	195.2	219.3	212.1	221.4	221.4	280.6
N		23	23	23	23	23	23	23

G=GRAVID NG=NON GRAVID WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN
DE=DELIVERED EARLY WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

SL 042640

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
INDIVIDUAL BODY WEIGHTS (GRAMS) DURING GESTATION

PREGNANCY STATUS		DAY 0	6	9	12	15	19	29
DAMS FROM GROUP 2: I - 1000 PPM								
15944	G	3501.4	3713.6	3692.9	3681.0	3772.2	3718.5	3797.5
15945	G	3426.4	3488.1	3422.4	3426.0	3400.7	3300.5	3549.1
15957	G	3262.7	3390.4	3348.5	3381.1	3453.9	3518.9	3657.7
15962	G	3727.5	3861.9	3737.6	3809.2	3583.2	3865.4	4029.1
15963	G	3376.6	3545.8	3372.8	3285.7	3238.8	3184.8	3540.2
15964	G	3914.0	3721.1	3736.6	3625.6	3727.0	3809.4	4231.3
15965	G	3231.8	3247.4	3189.5	3230.5	3266.9	3334.8	3510.9
15971	G	3896.9	3966.4	3900.5	3910.7	4076.3	4068.6	4290.8
15974	RS	3445.7	3478.0	3344.1	3246.3			
15975	G	3571.1	3790.5	3699.9	3667.2	3732.8	3792.4	3950.9
15976	G	3172.1	3310.8	3232.1	3261.4	3302.6	3248.3	3301.5
15981	G	3530.3	3744.2	3669.5	3660.0	3663.1	3622.7	3920.2
15983	G	3637.9	3724.4	3740.1	3716.8	3728.6	3755.0	3954.0
15986	G	3658.8	3870.9	3855.8	3883.2	3971.4	3949.3	4082.2
15996	G	3433.1	3403.1	3438.1	3555.2	3673.6	3650.9	3793.3
16010	G	3153.7	3271.2	3198.0	3203.5	3225.1	3230.2	3481.4
16015	G	3340.5	3461.1	3428.6	3403.9	3417.5	3386.2	3438.4
16026	G	4210.8	4587.6	4495.2	4581.7	4610.7	4639.2	5008.2
16027	G	3552.9	3487.7	3480.8	3477.0	3603.2	3458.1	3804.6
16030	G	3570.3	3768.9	3675.5	3764.1	3798.3	3928.6	4025.5
16031	NG	3504.3	3477.8	3429.6	3420.4	3286.5	3391.6	3742.0
16037	G	2974.0	3161.7	3112.7	3153.9	3256.2	3250.2	3453.2
16038	G	3495.2	3561.9	3487.9	3396.7	3363.8	3328.0	3393.7
16046	NG	3279.6	3228.7	3225.5	3156.5	3192.4	3220.1	3422.7
MEAN		3503.8	3616.2	3557.2	3560.0	3612.7	3621.0	3819.7
S.D.		278.6	310.8	308.6	324.5	335.5	358.8	395.1
N		22	22	22	22	21	21	21

G=GRAVID NG=NON GRAVID WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN
RS=REMOVED FROM STUDY WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

SL 042641

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
INDIVIDUAL BODY WEIGHTS (GRAMS) DURING GESTATION

PREGNANCY STATUS		DAY 0	6	9	12	15	19	29

DAMS FROM GROUP 3:		M - 3000 PPM						

15942	G	3389.9	3482.7	3413.5	3447.7	3471.4	3549.1	3871.1
15943	NG	3501.7	3781.7	3720.6	3634.8	3647.3	3710.2	3954.0
15947	G	3249.1	3405.3	3316.2	3294.3	3365.8	3372.3	3661.6
15950	G	3586.3	3501.9	3472.6	3450.1	3503.7	3549.3	3789.7
15952	G	3119.6	3096.5	3039.8	2991.3	2987.8	2971.6	3262.2
15956	G	3153.4	3434.4	3424.7	3493.0	3519.5	3421.4	3705.2
15958	G	4310.9	4293.0	4054.8	4060.7	3985.0	4050.4	4317.6
15960	G	3630.8	3766.5	3695.8	3634.4	3837.9	3850.7	4115.3
15968	G	3397.9	3871.4	3713.7	3631.8	3610.2	3530.5	3508.5
15973	NG	3755.4	3866.5	3771.0	3673.6	3695.0	3734.6	4013.7
15979	G	3403.1	3570.0	3472.4	3501.5	3597.8	3604.0	3929.7
15987	G	3661.9	3909.8	3762.6	3756.9	3817.9	3875.3	4037.7
15988	G	3355.2	3432.7	3351.5	3361.5	3436.4	3432.1	3652.3
15995	G	3598.5	3713.6	3580.1	3535.1	3500.3	3431.2	3647.2
15998	G	3401.9	3529.5	3467.1	3333.4	3393.2	3190.3	3405.0
16011	G	3545.2	3658.1	3523.1	3634.7	3737.7	3707.9	3621.0
16013	G	3284.6	3317.0	3394.9	3397.3	3451.1	3482.5	3408.8
16018	G	3450.9	3644.9	3545.7	3662.0	3646.4	3566.4	3997.7
16021	G	3513.2	3696.8	3595.6	3636.8	3630.9	3672.1	3817.4
16029	NG	3811.0	3712.4	3741.4	3706.0	3670.9	3663.5	3826.8
16032	G	3895.9	4022.7	3918.6	3948.2	4042.3	4042.1	4318.4
16034	G	3235.0	3500.2	3458.0	3453.9	3535.3	3510.9	3706.2
16048	NG	3480.8	3625.8	3527.6	3390.9	3341.4	3056.2	3683.5
16049	G	3438.7	3679.1	3567.6	3520.9	3571.2	3570.8	3888.0
MEAN		3481.1	3626.3	3538.4	3537.3	3582.1	3569.0	3783.0
S.D.		269.8	265.8	220.7	231.7	233.1	258.7	285.9
N		20	20	20	20	20	20	20

G=GRAVID NG=NON GRAVID WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
INDIVIDUAL BODY WEIGHTS (GRAMS) DURING GESTATION

PREGNANCY STATUS		DAY 0	6	9	12	15	19	29
DAMS FROM GROUP 4: R - 6000 PPM								
15948	G	3346.8	3361.9	3362.0	3325.2	3335.1	3274.3	3510.5
15951	G	3567.0	3600.1	3531.2	3540.4	3636.1	3750.0	4010.9
15955	G	3209.6	3328.2	3303.6	3221.1	3280.3	3219.1	3435.4
15959	G	3049.8	3273.1	3200.5	3239.1	3370.1	3450.0	3642.1
15972	G	3920.4	4088.7	4013.3	3973.3	3951.5	3916.4	4237.6
15978	G	3373.7	3535.4	3374.2	3358.7	3457.4	3464.3	3753.0
15982	G	3635.3	3802.8	3736.7	3748.4	3750.5	3766.1	3865.3
15984	G	3576.1	3510.8	3516.4	3526.9	3538.0	3492.9	3800.5
15989	G	3720.4	3997.1	3926.6	3934.5	3943.9	3952.7	4184.9
15992	NG	3527.8	3590.8	3546.2	3491.8	3488.3	3462.6	3841.1
15999	G	3544.1	3559.1	3399.1	3413.5	3561.0	3434.1	3667.7
16001	G	3621.8	3699.3	3637.6	3627.1	3660.1	3668.2	3923.8
16007	G	3487.2	3684.9	3606.5	3595.2	3684.6	3755.4	3970.9
16008	NG	3230.8	3143.8	3007.1	2920.4	3026.7	3055.9	3342.8
16009	G	3240.2	3550.7	3411.5	3429.0	3546.7	3538.9	3809.2
16012	NG	3657.9	3752.9	3630.0	3503.4	3410.4	3277.3	3768.4
16014	G	3350.8	3425.7	3305.6	3345.0	3403.8	3531.5	3809.1
16019	G	3309.0	3544.3	3547.1	3404.0	3422.2	3436.9	3765.1
16022	G	3407.3	3512.6	3550.7	3473.9	3301.3	3439.9	3520.9
16023	G	3836.6	3907.9	3774.3	3764.1	3741.7	3685.7	3666.3
16033	G	3421.3	3475.6	3408.7	3383.8	3350.4	3366.1	3577.3
16040	G	3112.3	3253.9	3181.2	3134.0	3176.8	3159.2	3354.2
16043	G	4301.0	4353.7	4184.2	4078.8	4012.2	3893.8	4419.8
16044	G	3531.1	3533.9	3450.4	3506.8	3587.7	3634.0	3829.0
MEAN		3502.9	3619.0	3543.9	3524.9	3557.7	3563.3	3797.8
S.D.		286.7	277.9	261.9	253.4	232.8	224.8	266.9
N		21	21	21	21	21	21	21

G=GRAVID NG=NON GRAVID WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
CLINICAL OBSERVATIONS BY GESTATION DAY

DOSAGE GROUP	ANIMAL	CATEGORY	GESTATIONAL DAYS	FINDING

G - 0 PPM				
	16045	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15991	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16006	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15980	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15993	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15953	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15994	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15961	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16036	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16020	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16041	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16005	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15954	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16028	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16047	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16016	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15967	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15990	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15946	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16025	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16003	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16039	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
CLINICAL OBSERVATIONS BY GESTATION DAY

DOSAGE GROUP	ANIMAL	CATEGORY	GESTATIONAL DAYS	FINDING
I - 1000 PPM				
	16037	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15996	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15975	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15983	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15986	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16026	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15981	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16038	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15963	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
		FOOD/WATER	11- 20	FEED HOPPER FULL
	15957	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16010	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15976	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
		OTHER	22- 23	TISSUE ON PAPERBOARD (UNRECOGNIZABLE)
			21- 23	BLOOD (BY HEMASTIX) ON PAPERBOARD
	16015	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15945	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15944	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
		OTHER	21- 23	BLOOD (BY HEMASTIX) ON PAPERBOARD
			21- 22	TISSUE ON PAPERBOARD (UNRECOGNIZABLE)
	16030	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15971	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15964	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15962	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16027	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
CLINICAL OBSERVATIONS BY GESTATION DAY

DOSAGE GROUP	ANIMAL	CATEGORY	GESTATIONAL DAYS	FINDING
I - 1000 PPM	16027	DEAD	29- 29	SCHEDULED SACRIFICE
	15965	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
M - 3000 PPM	16034	NORMAL	3- 22	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
		EYES/EARS/NOSE	11- 29	LACRIMATION (EVL 8)
			12- 21	OCULAR DISCHARGE, OTHER (EVL 10)
	15947	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15979	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15995	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
		EXCRETA	12- 12	PAPERBOARD DRY
		FOOD/WATER	12- 20	FEED HOPPER FULL
	15960	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16032	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16049	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15968	NORMAL	2- 28	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
		FOOD/WATER	29- 29	FEED HOPPER FULL
	15988	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15956	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15952	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
		OTHER	11- 11	WATER TIP NOT FUNCTIONING - DRY PAPERBOARD
	16013	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15998	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
		FOOD/WATER	21- 21	FEED HOPPER FULL
		SKIN	25- 27	ABSCESS (NCK 3)
	16018	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15950	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15958	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15987	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
CLINICAL OBSERVATIONS BY GESTATION DAY

DOSAGE GROUP	ANIMAL	CATEGORY	GESTATIONAL DAYS	FINDING
M - 3000 PPM	15987	DEAD	29- 29	SCHEDULED SACRIFICE
	16011	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16021	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15942	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
R - 6000 PPM		DEAD	29- 29	SCHEDULED SACRIFICE
	16009	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15978	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15999	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16001	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15972	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
		EYES/EARS/NOSE	19	OCULAR DISCHARGE, OTHER (EVL 1)
		EXCRETA	17- 18	LOOSE FECES
	16044	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16007	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16022	NORMAL	2- 15	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
		SKIN	18- 29	ALOPECIA (HPB 14, NCK 4, PFL 4, SDB 14)
	16019	NORMAL	2- 24	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
		OTHER	24- 28	BLOOD (BY HEMASTIX) ON PAPERBOARD
	16040	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15959	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15948	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16014	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15951	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15982	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16023	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16043	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
CLINICAL OBSERVATIONS BY GESTATION DAY

DOSAGE GROUP	ANIMAL	CATEGORY	GESTATIONAL DAYS	FINDING

R - 6000 PPM	16043	DEAD	29- 29	SCHEDULED SACRIFICE
		EYES/EARS/NOSE	8- 18	OCULAR DISCHARGE, OTHER (EYB 9, EYR 2)
		EXCRETA	7	LOOSE FECES
	15989	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15984	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	16033	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE
	15955	NORMAL	0- 29	NO SIGNIFICANT CLINICAL OBSERVATIONS
		DEAD	29- 29	SCHEDULED SACRIFICE

APPENDIX 3

Necropsy Data Including Individual Fetal Body Weights

(20 Pages)

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
DAM GROSS EXAMINATION AT TIME OF LAPAROTOMY

ALL DEATHS COMBINED

GROUP: G - 0 PPM FEMALE

ANIMAL 16045 4-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16002 4-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15991 4-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16006 4-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15980 4-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15993 4-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15953 5-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15994 5-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15961 5-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16036 5-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16020 5-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16041 5-NOV-86

OVARIES

GROSS:

CYST

LEFT CLEAR FLUID 2MM IN DIAMETER

ANIMAL 16005 6-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15954 6-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16028 6-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
DAM GROSS EXAMINATION AT TIME OF LAPAROTOMY

ALL DEATHS COMBINED

GROUP: G - 0 PPM FEMALE

ANIMAL 16047 6-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16016 6-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15997 6-NOV-86

GROSS: N O T E X A M I N E D - REMOVED FROM STUDY

ANIMAL 15967 7-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15990 7-NOV-86

AMNIOTIC SACS
GROSS: ABSENT
PLACENTAS
GROSS: ABSENT

ANIMAL 15946 7-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16025 7-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16003 7-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16039 7-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
DAM GROSS EXAMINATION AT TIME OF LAPAROTOMY

ALL DEATHS COMBINED

GROUP: I - 1000 PPM FEMALE

ANIMAL 16037 4-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16046 4-NOV-86

UTERUS
GROSS: 2X2MM CLEAR FLUID FILLED AREA RIGHT HORN
AMNIOTIC SACS
GROSS: ABSENT
PLACENTAS
GROSS: ABSENT

ANIMAL 15996 4-NOV-86

UTERUS
GROSS: CONTAINS LIQUID FLUID
BILATERAL +++FOR BLOOD BY HEMASTIX

ANIMAL 15975 4-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15983 4-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15986 4-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16026 5-NOV-86

UTERUS
GROSS: CYST
MULTIPLE BILATERAL

ANIMAL 15981 5-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16038 5-NOV-86

CORPORA LUTEA
GROSS: ABSENT
AMNIOTIC SACS
GROSS: ABSENT
PLACENTAS
GROSS: ABSENT

ANIMAL 15963 5-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15957 5-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16010 5-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
DAM GROSS EXAMINATION AT TIME OF LAPAROTOMY

ALL DEATHS COMBINED

GROUP: I - 1000 PPM FEMALE

ANIMAL 15976 6-NOV-86

AMNIOTIC SACS
GROSS: ABSENT
PLACENTAS
GROSS: ABSENT

ANIMAL 16015 6-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15945 6-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15944 6-NOV-86

AMNIOTIC SACS
GROSS: ABSENT
PLACENTAS
GROSS: ABSENT

ANIMAL 16030 6-NOV-86

VAGINA
GROSS: DISCHARGE BLOODY
TAKEN OUT OF ORDER +++BLOOD BY HEMASTIX

ANIMAL 15971 6-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15964 7-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15962 7-NOV-86

AMNIOTIC SACS
GROSS: ABSENT
PLACENTAS
GROSS: ABSENT

ANIMAL 16027 7-NOV-86

CORPORA LUTEA
GROSS: ABSENT
AMNIOTIC SACS
GROSS: ABSENT
PLACENTAS
GROSS: ABSENT

ANIMAL 16031 7-NOV-86

CORPORA LUTEA
GROSS: ABSENT
AMNIOTIC SACS
GROSS: ABSENT
PLACENTAS
GROSS: ABSENT

ANIMAL 15974 23-OCT-86

GROSS: NOT EXAMINED - DELIVERED EARLY

ANIMAL 15965 7-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
DAM GROSS EXAMINATION AT TIME OF LAPAROTOMY

ALL DEATHS COMBINED

GROUP: M - 3000 PPM FEMALE

<u>ANIMAL</u>	<u>16034</u>	<u>4-NOV-86</u>	EXAMINED - NO SIGNIFICANT LESIONS
<u>ANIMAL</u>	<u>15947</u>	<u>4-NOV-86</u>	EXAMINED - NO SIGNIFICANT LESIONS
<u>ANIMAL</u>	<u>15979</u>	<u>4-NOV-86</u>	EXAMINED - NO SIGNIFICANT LESIONS
<u>ANIMAL</u>	<u>15995</u>	<u>4-NOV-86</u>	EXAMINED - NO SIGNIFICANT LESIONS
<u>ANIMAL</u>	<u>15960</u>	<u>4-NOV-86</u>	EXAMINED - NO SIGNIFICANT LESIONS
<u>ANIMAL</u>	<u>16032</u>	<u>4-NOV-86</u>	EXAMINED - NO SIGNIFICANT LESIONS
<u>ANIMAL</u>	<u>16029</u>	<u>5-NOV-86</u>	CORPORA LUTEA GROSS: ABSENT AMNIOTIC SACS GROSS: ABSENT PLACENTAS GROSS: ABSENT
<u>ANIMAL</u>	<u>15943</u>	<u>5-NOV-86</u>	AMNIOTIC SACS GROSS: ABSENT PLACENTAS GROSS: ABSENT
<u>ANIMAL</u>	<u>16049</u>	<u>5-NOV-86</u>	EXAMINED - NO SIGNIFICANT LESIONS
<u>ANIMAL</u>	<u>15968</u>	<u>5-NOV-86</u>	EXAMINED - NO SIGNIFICANT LESIONS
<u>ANIMAL</u>	<u>15988</u>	<u>5-NOV-86</u>	EXAMINED - NO SIGNIFICANT LESIONS
<u>ANIMAL</u>	<u>15956</u>	<u>5-NOV-86</u>	EXAMINED - NO SIGNIFICANT LESIONS
<u>ANIMAL</u>	<u>15952</u>	<u>6-NOV-86</u>	EXAMINED - NO SIGNIFICANT LESIONS
<u>ANIMAL</u>	<u>16013</u>	<u>6-NOV-86</u>	EXAMINED - NO SIGNIFICANT LESIONS

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
DAM GROSS EXAMINATION AT TIME OF LAPAROTOMY

ALL DEATHS COMBINED

GROUP: M - 3000 PPM FEMALE

ANIMAL 15998 6-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16018 6-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15950 6-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15958 6-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15973 7-NOV-86

CORPORA LUTEA
GROSS: ABSENT
AMNIOTIC SACS
GROSS: ABSENT
PLACENTAS
GROSS: ABSENT

ANIMAL 15987 7-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16011 7-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16021 7-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16048 7-NOV-86

CORPORA LUTEA
GROSS: ABSENT
AMNIOTIC SACS
GROSS: ABSENT
PLACENTAS
GROSS: ABSENT

ANIMAL 15942 7-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
DAM GROSS EXAMINATION AT TIME OF LAPAROTOMY

ALL DEATHS COMBINED

GROUP: R - 6000 PPM FEMALE

ANIMAL 16008 4-NOV-86

CORPORA LUTEA
GROSS: ABSENT
UTERUS
GROSS: CYST
RIGHT HORN 2X2MM CLEAR
AMNIOTIC SACS
GROSS: ABSENT
PLACENTAS
GROSS: ABSENT

ANIMAL 16009 4-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15978 4-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15999 4-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16001 4-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15972 4-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16012 5-NOV-86

UTERUS
GROSS: CYST
RIGHT
MULTIPLE CLEAR FLUID
AMNIOTIC SACS
GROSS: ABSENT
PLACENTAS
GROSS: ABSENT

ANIMAL 16044 5-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16007 5-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16022 5-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16019 5-NOV-86

PLACENTAS
GROSS: CONTAINS BLOOD (BY HEMASTIX)
+++FOR BLOOD

ANIMAL 16040 5-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
DAM GROSS EXAMINATION AT TIME OF LAPAROTOMY

ALL DEATHS COMBINED

GROUP: R - 6000 PPM FEMALE

ANIMAL 15959 6-NOV-86

UTERUS

GROSS: MISSING RIGHT UTERINE HORN
FALLOPIAN TUBE AND OVARY NORMAL

ANIMAL 15948 6-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16014 6-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15951 6-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15982 6-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16023 6-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 16043 7-NOV-86

AMNIOTIC SACS

GROSS: ABSENT
PLACENTAS
GROSS: ABSENT

ANIMAL 15989 7-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15984 7-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15992 7-NOV-86

CORPORA LUTEA

GROSS: ABSENT
AMNIOTIC SACS
GROSS: ABSENT
PLACENTAS
GROSS: ABSENT

ANIMAL 16033 7-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

ANIMAL 15955 7-NOV-86

EXAMINED - NO SIGNIFICANT LESIONS

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
GRAVID UTERINE WEIGHT AND NET MATERNAL BODY WEIGHT IN GRAMS
FEMALE GROUP: 0 PPM

	PREGNANCY STATUS	INITIAL BODY WT.	TERMINAL BODY WT.	UTERUS	NET BODY WEIGHT	NET BODY WT. CHANGE	LIVER
16045	G	3149.30	3430.00	553.86	2876.14	-273.16	89.40
16002	NG	3250.40	3676.10	30.83	3645.27	394.87	102.31
15991	G	3352.70	3903.80	594.00	3309.80	-42.90	82.47
16006	G	3464.90	3890.50	473.89	3416.61	-48.29	94.00
15980	G	3647.80	4017.10	594.88	3422.22	-225.58	85.06
15993	G	3833.00	4321.40	613.41	3707.99	-125.01	91.63
15953	G	3584.70	4084.40	583.08	3501.32	-83.38	81.87
15994	G	3507.00	3988.00	553.77	3434.23	-72.77	98.53
15961	G	3499.40	3717.60	586.43	3131.17	-368.23	76.49
16036	G	3399.70	3876.10	623.16	3252.94	-146.76	87.89
16020	G	3279.00	3874.40	603.15	3271.25	-7.75	85.80
16041	G	3143.80	3519.50	466.52	3052.98	-90.82	74.49
16005	G	3159.70	3705.30	604.84	3100.46	-59.24	92.60
15954	G	3339.00	3723.40	580.02	3143.38	-195.62	77.24
16028	G	3353.90	3941.70	450.62	3491.08	137.18	94.49
16047	G	3454.30	3640.70	603.24	3037.46	-416.84	70.76
16016	G	3641.40	4353.10	630.14	3722.96	81.56	99.70
15967	G	3756.40	3831.30	610.32	3220.98	-535.42	83.54
15990	G	3658.50	4027.50	56.57	3970.93	312.43	91.13
15946	G	3592.50	4309.70	555.63	3754.07	161.57	108.47
16025	G	3515.30	3814.80	646.22	3168.58	-346.72	79.38
16003	G	3430.30	4011.10	274.95	3736.15	305.85	100.75
16039	G	3189.80	3771.70	356.93	3414.77	224.97	119.30
MEAN		3452.38	3897.87	527.98	3369.89	-82.50	89.32
S.D.		196.11	239.19	140.25	280.33	227.72	11.54
N		22	22	22	22	22	22

G=GRAVID NG=NON GRAVID WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
GRAVID UTERINE WEIGHT AND NET MATERNAL BODY WEIGHT IN GRAMS
FEMALE GROUP: 1000 PPM

	PREGNANCY STATUS	INITIAL BODY WT.	TERMINAL BODY WT.	UTERUS	NET BODY WEIGHT	NET BODY WT. CHANGE	LIVER
16037	G	2974.00	3453.20	436.22	3016.98	42.98	99.83
16046	NG	3279.60	3422.70	34.76	3387.94	108.34	86.36
15996	G	3433.10	3793.30	234.31	3558.99	125.89	0.00
15975	G	3571.10	3950.90	586.31	3364.59	-206.51	96.16
15983	G	3637.90	3954.00	417.03	3536.97	-100.93	99.32
15986	G	3658.80	4082.20	383.46	3698.74	39.94	97.48
16026	G	4210.80	5008.20	630.59	4377.61	166.81	116.51
15981	G	3530.30	3920.20	373.40	3546.80	16.50	118.68
16038	G	3495.20	3393.70	33.84	3359.86	-135.34	79.99
15963	G	3376.60	3540.20	416.59	3123.61	-252.99	97.65
15957	G	3262.70	3657.70	422.42	3235.28	-27.42	69.99
16010	G	3153.70	3481.40	397.74	3083.66	-70.04	81.20
15976	G	3172.10	3301.50	48.84	3252.66	80.56	96.80
16015	G	3340.50	3438.40	331.49	3106.91	-233.59	87.33
15945	G	3426.40	3549.10	496.89	3052.21	-374.19	69.88
15944	G	3501.40	3797.50	45.98	3751.52	250.12	138.64
16030	G	3570.30	4025.50	602.63	3422.87	-147.43	93.18
15971	G	3896.90	4290.80	649.83	3640.97	-255.93	86.85
15964	G	3914.00	4231.30	574.56	3656.74	-257.26	131.23
15962	G	3727.50	4029.10	62.94	3966.16	238.66	112.88
16027	G	3552.90	3804.60	43.63	3760.97	208.07	90.98
16031	NG	3504.30	3742.00	31.35	3710.65	206.35	134.92
15965	G	3231.80	3510.90	608.59	2902.31	-329.49	77.07
MEAN		3506.57	3819.70	371.30	3448.40	-58.17	92.46
S.D.		285.12	395.15	214.04	359.84	192.74	27.97
N		21	21	21	21	21	21

G=GRAVID NG=NON GRAVID WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
GRAVID UTERINE WEIGHT AND NET MATERNAL BODY WEIGHT IN GRAMS
FEMALE GROUP: 3000 PPM

	PREGNANCY STATUS	INITIAL BODY WT.	TERMINAL BODY WT.	UTERUS	NET BODY WEIGHT	NET BODY WT. CHANGE	LIVER
16034	G	3235.00	3706.20	491.91	3214.29	-20.71	93.61
15947	G	3249.10	3661.60	483.54	3178.06	-71.04	88.90
15979	G	3403.10	3929.70	668.38	3261.32	-141.78	90.19
15995	G	3598.50	3647.20	426.81	3220.39	-378.11	78.16
15960	G	3630.80	4115.30	672.00	3443.30	-187.50	81.27
16032	G	3895.90	4318.40	586.90	3731.50	-164.40	106.47
16029	NG	3811.00	3826.80	47.06	3779.74	-31.26	88.65
15943	NG	3501.70	3954.00	40.98	3913.02	411.32	81.71
16049	G	3438.70	3888.00	497.00	3391.00	-47.70	90.50
15968	G	3397.90	3508.50	484.75	3023.75	-374.15	78.15
15988	G	3355.20	3652.30	536.18	3116.12	-239.08	77.50
15956	G	3153.40	3705.20	490.88	3214.32	60.92	97.41
15952	G	3119.60	3262.20	413.49	2848.71	-270.89	67.50
16013	G	3284.60	3408.80	541.01	2867.79	-416.81	71.39
15998	G	3401.90	3405.00	235.68	3169.32	-232.58	117.77
16018	G	3450.90	3997.70	638.63	3359.07	-91.83	98.98
15950	G	3586.30	3789.70	334.37	3455.33	-130.97	91.94
15958	G	4310.90	4317.60	678.97	3638.63	-672.27	106.24
15973	NG	3755.40	4013.70	54.21	3959.49	204.09	116.79
15987	G	3661.90	4037.70	204.92	3832.78	170.88	117.18
16011	G	3545.20	3621.00	496.49	3124.51	-420.69	76.21
16021	G	3513.20	3817.40	324.98	3492.42	-20.78	116.13
16048	NG	3480.80	3683.50	33.72	3649.78	168.98	141.70
15942	G	3389.90	3871.10	642.34	3228.76	-161.14	76.69
MEAN		3481.10	3783.03	492.46	3290.57	-190.53	91.11
S.D.		269.79	285.93	139.05	258.27	194.55	15.54
N		20	20	20	20	20	20

G=GRAVID NG=NON GRAVID WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
GRAVID UTERINE WEIGHT AND NET MATERNAL BODY WEIGHT IN GRAMS
FEMALE GROUP: 6000 PPM

	PREGNANCY STATUS	INITIAL BODY WT.	TERMINAL BODY WT.	UTERUS	NET BODY WEIGHT	NET BODY WT. CHANGE	LIVER
16008	NG	3230.80	3342.80	25.52	3317.28	86.48	131.46
16009	G	3240.20	3809.20	387.76	3421.44	181.24	75.30
15978	G	3373.70	3753.00	537.97	3215.03	-158.67	101.17
15999	G	3544.10	3667.70	506.61	3161.09	-383.01	81.55
16001	G	3621.80	3923.80	381.40	3542.40	-79.40	114.36
15972	G	3920.40	4237.60	437.88	3799.72	-120.68	108.28
16012	NG	3657.90	3768.40	47.05	3721.35	63.45	131.56
16044	G	3531.10	3829.00	438.70	3390.30	-140.80	98.96
16007	G	3487.20	3970.90	538.69	3432.21	-54.99	90.98
16022	G	3407.30	3520.90	339.77	3181.13	-226.17	92.67
16019	G	3309.00	3765.10	352.94	3412.16	103.16	98.58
16040	G	3112.30	3354.20	513.11	2841.09	-271.21	82.75
15959	G	3049.80	3642.10	472.65	3169.45	119.65	88.63
15948	G	3346.80	3510.50	481.82	3028.68	-318.12	86.86
16014	G	3350.80	3809.10	554.22	3254.88	-95.92	82.98
15951	G	3567.00	4010.90	531.94	3478.96	-88.04	85.88
15982	G	3635.30	3865.30	324.31	3540.99	-94.31	106.87
16023	G	3836.60	3666.30	330.91	3335.39	-501.21	92.84
16043	G	4301.00	4419.80	37.11	4382.69	81.69	131.93
15989	G	3720.40	4184.90	595.19	3589.71	-130.69	97.79
15984	G	3576.10	3800.50	529.25	3271.25	-304.85	100.88
15992	NG	3527.80	3841.10	35.79	3805.31	277.51	127.38
16033	G	3421.30	3577.30	318.85	3258.45	-162.85	104.23
15955	G	3209.60	3435.40	399.79	3035.61	-173.99	81.87
MEAN		3502.94	3797.79	429.09	3368.70	-134.25	95.49
S.D.		286.73	266.90	124.63	318.29	169.02	13.22
N		21	21	21	21	21	21

G=GRAVID NG=NON GRAVID WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL DATA AT TIME OF LAPAROTOMY
FEMALE GROUP: G - 0 PPM

ANIMAL	SEX		VIABLE FETUSES			DEAD FETUSES			EARLY RESORPTIONS			LATE RESORPTIONS			IMPLANTATION SITES			CORPORA LUTEA		
			RIGHT HORN	LEFT HORN	TOTAL	RIGHT HORN	LEFT HORN	TOTAL	RIGHT HORN	LEFT HORN	TOTAL	RIGHT HORN	LEFT HORN	TOTAL	RIGHT HORN	LEFT HORN	TOTAL	RIGHT OVARY	LEFT OVARY	TOTAL
16045	3	6	5	4	9	0	0	0	0	0	0	0	0	0	5	4	9	5	6	11
16002	NON GRAVID																			
15991	7	2	1	8	9	0	0	0	0	1	1	0	0	0	1	9	10	2	7	9
16006	3	5	4	4	8	0	0	0	1	1	2	0	0	0	5	5	10	5	5	10
15980	5	4	3	6	9	0	0	0	0	0	0	0	0	0	3	6	9	5	6	11
15993	5	4	3	6	9	0	0	0	1	0	1	0	0	0	4	6	10	4	6	10
15953	5	4	4	5	9	0	0	0	0	1	1	0	0	0	4	6	10	4	6	10
15994	3	6	1	8	9	0	0	0	0	0	0	0	0	0	1	8	9	2	8	10
15961	5	4	4	5	9	0	0	0	0	0	0	0	0	0	4	5	9	8	5	13
16036	3	7	6	4	10	0	0	0	0	0	0	0	0	0	6	4	10	6	4	10
16020	5	5	7	3	10	0	0	0	0	0	0	0	0	0	7	3	10	7	3	10
16041	4	2	3	3	6	1	0	1	0	0	0	0	0	0	4	3	7	5	3	8
16005	6	5	8	5	11	0	0	0	0	1	1	0	0	0	6	6	12	6	6	12
15954	3	5	3	5	8	0	0	0	0	2	2	0	0	0	3	7	10	3	8	11
16028	3	4	5	2	7	0	0	0	0	1	1	0	0	0	5	3	8	6	3	9
16047	7	3	3	7	10	0	0	0	0	0	0	0	0	0	3	7	10	3	8	11
16016	8	3	6	5	11	0	0	0	0	1	1	0	0	0	6	6	12	6	6	12
15967	4	6	6	4	10	1	0	1	0	0	0	0	0	0	7	4	11	7	4	11
15990	0	0	0	0	0	0	0	0	3	5	8	0	0	0	3	5	8	3	5	8
15946	4	9	8	5	13	0	0	0	1	0	1	0	0	0	9	5	14	9	5	14
16025	2	8	7	3	10	0	0	0	0	0	0	0	0	0	7	3	10	7	3	10
16003	2	1	0	3	3	0	0	0	0	0	0	0	0	0	0	3	3	6	4	10
16039	2	3	3	2	5	0	0	0	0	0	0	0	0	0	3	2	5	4	3	7
TOTAL	89	96	88	97	185	2	0	2	6	13	19	0	0	0	96	110	206	113	114	227
MEAN	4.0	4.4	4.0	4.4	8.4	0.1	0.0	0.1	0.3	0.6	0.9	0.0	0.0	0.0	4.4	5.0	9.4	5.1	5.2	10.3
S.D.	1.9	2.2	2.3	1.9	2.8	0.3	0.0	0.3	0.7	1.1	1.7	0.0	0.0	0.0	2.2	1.8	2.3	1.9	1.7	1.6
22 GRAVID																				

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DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL DATA AT TIME OF LAPAROTOMY
FEMALE GROUP: I - 1000 PPM

ANIMAL	SEX # M F	VIABLE FETUSES			DEAD FETUSES			EARLY RESORPTIONS			LATE RESORPTIONS			IMPLANTATION SITES			CORPORA LUTEA			
		RIGHT HORN	LEFT HORN	TOTAL	RIGHT HORN	LEFT HORN	TOTAL	RIGHT HORN	LEFT HORN	TOTAL	RIGHT HORN	LEFT HORN	TOTAL	RIGHT HORN	LEFT HORN	TOTAL	RIGHT OVARY	LEFT OVARY	TOTAL	
16037	1	6	6	1	7	0	0	0	0	0	0	0	0	0	6	1	7	6	1	7
16046	NON GRAVID																			
15996	2	0	1	1	2	0	0	0	1	2	3	3	3	6	5	6	11	4	8	12
15975	6	3	6	3	9	1	0	1	0	0	0	0	0	0	7	3	10	7	4	11
15983	5	1	3	3	6	0	0	0	1	0	1	0	0	0	4	3	7	4	3	7
15986	2	2	3	1	4	0	0	0	2	3	5	0	0	0	5	4	9	5	4	9
16026	5	5	3	7	10	0	0	0	0	0	0	0	0	0	3	7	10	3	8	11
15981	2	2	1	3	4	0	0	0	3	2	5	0	0	0	4	5	9	4	5	9
16038	0	0	0	0	0	0	0	0	4	2	6	0	0	0	4	2	6	0	0	0
15963	2	4	4	2	6	1	1	2	0	0	0	0	0	0	5	3	8	5	3	8
15957	2	5	5	2	7	1	0	1	0	0	0	0	0	0	6	2	8	6	4	10
16010	4	2	5	1	6	0	0	0	1	0	1	0	0	0	6	1	7	6	3	9
15976	0	0	0	0	0	0	0	0	2	5	7	0	0	0	2	5	7	3	5	8
16015	4	1	4	1	5	0	0	0	0	0	0	0	0	0	4	1	5	6	4	10
15945	5	4	3	6	9	0	0	0	1	0	1	0	0	0	4	6	10	4	6	10
15944	0	0	0	0	0	0	0	0	4	5	9	0	0	0	4	5	9	5	6	11
16030	8	2	4	6	10	1	0	1	0	0	0	0	0	0	5	6	11	5	6	11
15971	6	3	2	7	9	0	0	0	0	0	0	0	0	0	2	7	9	3	8	11
15964	5	2	3	4	7	0	0	0	3	1	4	0	0	0	6	5	11	7	5	12
15962	0	0	0	0	0	0	0	0	4	3	7	0	0	0	4	3	7	4	3	7
16027	0	0	0	0	0	0	0	0	2	0	2	0	0	0	2	0	2	0	0	0
16031	NON GRAVID																			
15965	5	4	3	6	9	0	1	1	0	0	0	0	0	0	3	7	10	4	7	11
TOTAL	64	46	56	54	110	4	2	6	28	23	51	3	3	6	91	82	173	91	93	184
MEAN	3.0	2.2	2.7	2.6	5.2	0.2	0.1	0.3	1.3	1.1	2.4	0.1	0.1	0.3	4.3	3.9	8.2	4.3	4.4	8.8
S.D.	2.4	1.9	2.0	2.5	3.6	0.4	0.3	0.6	1.5	1.7	2.9	0.7	0.7	1.3	1.4	2.2	2.2	1.9	2.4	3.3
21 GRAVID																				

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL DATA AT TIME OF LAPAROTOMY
FEMALE GROUP: M - 3000 PPM

ANIMAL	SEX # M F		VIABLE FETUSES			DEAD FETUSES			EARLY RESORPTIONS			LATE RESORPTIONS			IMPLANTATION SITES			CORPORA LUTEA		
			RIGHT HORN	LEFT HORN	TOTAL	RIGHT HORN	LEFT HORN	TOTAL	RIGHT HORN	LEFT HORN	TOTAL	RIGHT HORN	LEFT HORN	TOTAL	RIGHT HORN	LEFT HORN	TOTAL	RIGHT OVARY	LEFT OVARY	TOTAL
16034	5	4	2	7	9	0	0	0	0	0	0	0	0	0	2	7	9	2	7	9
15947	6	1	2	5	7	0	0	0	0	0	0	0	0	0	2	5	7	2	6	8
15979	4	7	7	4	11	0	0	0	0	1	1	0	0	0	7	5	12	8	5	13
15995	2	5	5	2	7	1	0	1	0	0	0	0	0	0	6	2	8	7	3	10
15960	9	2	5	6	11	0	0	0	1	0	1	0	0	0	6	6	12	6	6	12
16032	7	4	4	7	11	0	0	0	0	0	0	0	0	0	4	7	11	4	7	11
16029	NON GRAVID																			
15943	NON GRAVID																			
16049	5	4	4	5	9	0	0	0	0	0	0	0	0	0	4	5	9	4	6	10
15968	5	3	5	3	8	0	0	0	0	0	0	0	0	0	5	3	8	4	4	8
15988	2	7	3	6	9	0	0	0	0	0	0	0	0	0	3	6	9	4	6	10
15956	2	4	4	2	6	0	1	1	0	0	0	0	0	0	4	3	7	4	5	9
15952	3	6	2	7	9	0	0	0	0	1	1	0	0	0	2	8	10	2	8	10
16013	5	5	5	5	10	1	0	1	1	0	1	0	0	0	7	5	12	6	6	12
15998	0	2	0	2	2	6	3	9	0	0	0	0	0	0	6	5	11	7	5	12
16018	5	7	6	6	12	0	0	0	0	0	0	0	0	0	6	6	12	6	7	13
15950	2	3	4	1	5	0	0	0	3	1	4	0	0	0	7	2	9	7	3	10
15958	4	7	6	5	11	0	0	0	0	0	0	0	0	0	6	5	11	7	6	13
15973	NON GRAVID																			
15987	0	2	2	0	2	0	0	0	0	0	0	0	0	0	2	0	2	2	10	12
16011	3	5	1	7	8	0	0	0	0	0	0	0	0	0	1	7	8	1	8	9
16021	4	1	1	4	5	0	0	0	0	0	0	0	0	0	1	4	5	4	4	8
16048	NON GRAVID																			
15942	9	4	4	9	13	0	0	0	0	0	0	0	0	0	4	9	13	4	9	13
TOTAL	82	83	72	93	165	8	4	12	5	3	8	0	0	0	85	100	185	91	121	212
MEAN	4.1	4.2	3.6	4.7	8.3	0.4	0.2	0.6	0.2	0.2	0.4	0.0	0.0	0.0	4.3	5.0	9.3	4.6	6.1	10.6
S.D.	2.5	2.0	1.9	2.4	3.1	1.4	0.7	2.0	0.7	0.4	0.9	0.0	0.0	0.0	2.1	2.2	2.7	2.1	1.8	1.8
20 GRAVID																				

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL DATA AT TIME OF LAPAROTOMY
FEMALE GROUP: R - 6000 PPM

ANIMAL	SEX		VIABLE FETUSES			DEAD FETUSES			EARLY RESORPTIONS			LATE RESORPTIONS			IMPLANTATION SITES			CORPORA LUTEA			
	#	M	F	RIGHT HORN	LEFT HORN	TOTAL	RIGHT HORN	LEFT HORN	TOTAL	RIGHT HORN	LEFT HORN	TOTAL	RIGHT HORN	LEFT HORN	TOTAL	RIGHT HORN	LEFT HORN	TOTAL	RIGHT OVARY	LEFT OVARY	TOTAL
16008																					
16009	2	4		1	5	6	0	0	0	0	0	0	0	0	0	1	5	6	5	5	10
15978	5	3		7	1	8	0	0	0	0	0	0	0	0	0	7	1	8	7	1	8
15999	4	4		4	4	8	0	0	0	0	0	0	0	0	0	4	4	8	4	4	8
16001	4	2		2	4	6	0	0	0	1	0	1	0	0	0	3	4	7	5	6	11
15972	5	3		3	5	8	0	2	2	0	0	0	0	0	0	3	7	10	3	7	10
16012																					
16044	1	7		2	6	8	0	0	0	0	2	2	0	0	0	2	8	10	3	8	11
16007	6	3		4	5	9	0	0	0	0	0	0	0	0	0	4	5	9	4	6	10
16022	3	2		2	3	5	0	0	0	0	1	1	0	0	0	2	4	6	3	5	8
16019	2	2		2	2	4	1	1	2	2	1	3	1	0	1	6	4	10	6	4	10
16040	6	4		4	6	10	0	0	0	0	0	0	0	0	0	4	6	10	4	7	11
15959	6	1		0	7	7	0	0	0	0	0	0	0	0	0	0	7	7	2	7	9
15948	4	4		2	6	8	0	0	0	0	0	0	0	0	0	2	6	8	2	6	8
16014	6	4		5	5	10	0	0	0	0	0	0	0	0	0	5	5	10	7	5	12
15951	4	6		6	4	10	0	0	0	0	0	0	0	0	0	6	4	10	6	5	11
15982	1	5		0	6	6	0	0	0	0	1	1	0	0	0	0	7	7	0	7	7
16023	0	5		1	4	5	0	0	0	1	1	2	0	0	0	2	5	7	2	6	8
16043	0	0		0	0	0	0	0	0	3	1	4	0	0	0	3	1	4	3	0	3
15989	7	3		5	5	10	0	0	0	0	0	0	0	0	0	5	5	10	6	5	11
15984	2	8		6	4	10	0	0	0	0	0	0	0	0	0	6	4	10	6	5	11
15992																					
16033	3	1		1	3	4	0	0	0	2	0	2	0	0	0	3	3	6	3	3	6
15955	2	4		5	1	6	0	0	0	2	1	3	0	0	0	7	2	9	7	4	11
TOTAL	73	75		62	86	148	1	3	4	11	8	19	1	0	1	75	97	172	88	106	194
MEAN	3.5	3.6		3.0	4.1	7.0	0.0	0.1	0.2	0.5	0.4	0.9	0.0	0.0	0.0	3.6	4.6	8.2	4.2	5.0	9.2
S.D.	2.1	2.0		2.2	1.9	2.6	0.2	0.5	0.6	0.9	0.6	1.3	0.2	0.0	0.2	2.1	1.9	1.8	2.0	2.0	2.2
21 GRAVID																					

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
INDIVIDUAL FETAL WEIGHTS (GRAMS)
FEMALE GROUP: G - 0 PPM

ANIMAL	IMPLANT #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
15946	28.26	30.59	28.88	29.97	31.52	25.28	18.53	EP	36.20	/29.55	24.96	31.67	33.88	31.84		
15953	36.92	42.95	39.02	36.99	/43.85	41.12	44.75	35.40	37.47	EP						
15954	50.16	43.23	49.58	/	EP	47.48	40.23	49.96	46.67	52.09	EP					
15961	47.68	41.95	45.39	45.20	/41.81	43.07	45.06	40.95	45.83							
15967	43.13	46.27	41.35	36.28	29.84	4.07D	32.25	/38.54	43.32	43.18	42.73					
15980	51.43	45.53	43.80	/43.76	38.17	44.70	47.98	46.76	48.79							
15990	E	E	E	/	E	E	E	E	E							
15991	48.76	/	EP	39.33	34.31	37.85	44.55	47.23	45.50	42.56	43.58					
15993	52.66	47.54	EP	47.45	/49.58	45.06	43.07	41.20	47.31	54.73						
15994	48.56	/42.63	45.35	40.67	43.33	35.27	33.12	41.27	45.27							
16003	/58.63	51.68	58.47													
16005	41.44	41.10	42.46	41.91	31.31	36.67	/36.03	35.84	31.83	34.04	38.76	EP				
16006	40.25	34.09	36.91	EP	43.30	/35.90	34.56	35.69	EP	42.09						
16016	41.20	43.50	44.64	44.34	27.84	37.09	/39.51	35.01	30.51	37.76	EP	47.33				
16020	49.62	42.97	42.18	36.00	27.98	34.72	39.25	/43.40	44.83	44.08						
16025	45.99	48.03	45.39	46.78	47.39	38.71	43.11	/49.92	52.00	52.26						
16028	43.88	41.64	41.78	38.46	47.39	/	EP	45.69	44.98							
16036	43.89	40.38	45.80	43.19	41.15	37.47	/47.31	40.25	46.41	48.21						
16039	50.20	43.13	48.28	/47.69	49.34											
16041	52.31	45.98	0.60D	48.88	/49.50	52.01	59.35									
16045	44.14	43.14	36.72	34.40	38.64	/43.77	45.71	45.03	47.08							
16047	46.36	46.96	38.37	/39.47	37.66	40.57	44.57	40.26	44.07	45.54						

D= DEAD FETUS, EP= EARLY RESORPTION W/PLACENTA, E = EARLY RESORPTION, LF= LATE RESORPTION W/FETAL TISSUE,
LB= LATE RESORPTION W/LIMB BUDS, /= CERVIX POSITION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
INDIVIDUAL FETAL WEIGHTS (GRAMS)
FEMALE GROUP: I - 1000 PPM

ANIMAL	IMPLANT #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
15944	E	E	E	E	/	E	E	E	E	E						
15945	44.25	38.09	27.26	EP	/34.54	35.75	38.63	37.21	41.02	42.63						
15957	38.74	34.87	36.78	31.94	24.19D	35.77	/36.85	38.28								
15962	E	E	E	E	/	E	E	E								
15963	45.57	43.21	35.74	1.24D	41.81	/39.78	5.92D	43.32								
15964	EP	53.26	EP	EP	49.02	50.81	/52.66	51.57	50.97	EP	52.80					
15965	39.06	45.61	41.66	/38.54	33.29	21.94D	36.33	42.51	42.90	51.20						
15971	57.36	46.79	/40.10	41.38	47.23	50.19	42.28	55.04	56.66							
15975	8.73D	51.66	37.86	44.19	44.50	37.21	38.29	/45.18	42.94	34.18						
15976	E	E	/	E	E	E	E	E								
15981	EP	48.51	EP	EP	/55.09	48.63	51.01	EP	EP							
15983	47.82	41.85	E	40.83	/39.43	45.30	48.42									
15986	59.99	EP	55.28	54.47	EP	/	EP	54.68	EP	EP						
15996	EP	47.24	LF	LF	LF	/	EP	LF	LF	LF	40.14	EP				
16010	41.11	48.35	50.46	47.85	42.26	EP	/44.77									
16015	43.39	41.88	42.64	38.57	/44.00											
16026	46.98	54.06	45.08	/43.15	27.13	32.63	44.17	46.25	49.47	44.03						
16027	E	E	/													
16030	45.98	43.57	36.77	32.47	0.42D	/46.96	30.14	39.39	40.93	44.55	52.07					
16037	40.56	44.70	43.84	31.71	40.81	45.29	/47.10									
16038	E	E	E	E	/	E	E									

D= DEAD FETUS, EP= EARLY RESORPTION W/PLACENTA, E = EARLY RESORPTION, LF= LATE RESORPTION W/FETAL TISSUE,
LB= LATE RESORPTION W/LIMB BUDS, /= CERVIX POSITION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
INDIVIDUAL FETAL WEIGHTS (GRAMS)
FEMALE GROUP: M - 3000 PPM

ANIMAL	IMPLANT #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
15942		41.24	40.68	36.70	24.53	/33.57	33.85	22.72	39.92	28.43	29.52	36.51	39.12	41.93		
15947		50.12	48.68	/43.34	46.37	42.68	42.95	45.59								
15950		44.10	40.77	EP	44.15	EP	26.12	EP	/48.44	E						
15952		36.74	28.05	/25.15	20.81	EP	25.21	22.25	29.50	33.81	32.07					
15956		55.55	47.11	41.14	42.21	/40.12	46.31	53.57D								
15958		47.77	42.42	35.59	38.92	33.23	40.68	/44.68	41.90	41.40	47.15	41.03				
15960		45.35	42.77	40.34	35.26	EP	41.19	/40.69	39.11	40.36	43.01	43.10	47.61			
15968		45.74	37.19	35.57	37.23	42.42	/42.22	38.79	43.66							
15979		52.96	40.43	41.16	36.63	35.53	36.22	41.35	/38.42	37.23	EP	46.77	51.31			
15987		57.99	54.73	/												
15988		47.93	44.03	42.68	/41.74	28.54	36.07	32.54	43.04	51.43						
15995		38.86	40.39	4.71D	35.07	32.52	40.57	/42.25	43.54							
15998		1.07D	1.13D	1.03D	0.89D	1.32D	1.41D	/ 1.12D	36.49	1.17D	0.98D	A				
16011		42.48	/42.68	36.49	36.50	41.43	39.45	40.49	45.12							
16013		EP	34.59	30.85	35.19	1.95D	37.13	38.28	/31.00	30.83	32.49	35.66	34.90			
16018		45.13	41.66	37.78	23.12	26.41	27.30	/37.56	40.04	36.06	26.65	29.98	45.19			
16021		38.35	/42.79	38.05	36.66	40.67										
16032		43.98	43.65	46.12	41.46	/28.50	24.52	21.02	28.61	31.14	41.56	43.16				
16034		41.59	36.91	/34.89	34.29	39.62	31.70	29.67	35.08	37.66						
16049		40.09	37.86	36.27	35.88	/42.63	30.50	33.50	35.14	38.67						

D= DEAD FETUS, EP= EARLY RESORPTION W/PLACENTA, E = EARLY RESORPTION, LF= LATE RESORPTION W/FETAL TISSUE,
LB= LATE RESORPTION W/LIMB BUDS, /= CERVIX POSITION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
INDIVIDUAL FETAL WEIGHTS (GRAMS)
FEMALE GROUP: R - 6000 PPM

ANIMAL	IMPLANT #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
15948		46.12	39.28	/44.82	46.15	46.04	33.30	43.71	30.54							
15951		44.82	38.61	36.89	27.90	28.11	42.01	/39.52	37.44	37.92	41.71					
15955		EP	45.30	27.28	45.19	EP	48.10	47.71	/47.25	EP						
15959		/48.22	43.44	43.32	48.25	49.65	52.70	43.16								
15972		36.17	36.42	34.78	/38.98	27.79	0.60D	35.88	21.33	15.15D	36.34					
15978		48.47	37.49	39.32	42.11	43.41	44.15	48.74	/50.36							
15982		/26.05	37.17	29.24	EP	29.92	34.89	43.72								
15984		35.73	37.26	33.76	31.48	28.87	31.60	/35.03	39.30	32.40	36.83					
15989		46.22	41.47	44.29	35.31	36.85	/36.56	38.07	36.07	38.35	46.59					
15999		44.83	42.86	40.48	42.67	/46.04	43.94	41.84	42.33							
16001		40.74	EP	40.03	/44.00	43.85	39.92	38.47								
16007		47.42	43.14	45.67	43.98	/37.59	31.52	35.12	39.90	46.49						
16009		43.60	/41.96	34.74	41.83	46.26	49.65									
16014		35.77	31.66	32.91	40.51	35.67	/32.17	36.77	35.83	39.82	45.10					
16019		LF	EP	EP	38.09	50.47	10.15D	/33.11	46.76	EP	1.71D					
16022		43.48	38.40	/42.58	39.22	EP	46.21									
16023		EP	38.55	/32.88	35.19	41.59	43.93	EP								
16033		EP	EP	49.29	/47.28	51.99	49.46									
16040		35.41	41.35	35.61	36.03	/31.95	35.66	36.79	35.37	39.44	39.67					
16043		E	E	E	/E											
16044		42.48	43.21	/24.80	18.87	33.95	EP	EP	42.00	33.59	43.43					

D= DEAD FETUS, EP= EARLY RESORPTION W/PLACENTA, E = EARLY RESORPTION, LF= LATE RESORPTION W/FETAL TISSUE,
LB= LATE RESORPTION W/LIMB BUDD, /= CERVIX POSITION

APPENDIX 4

Malformations and Variations by Fetuses and by Litters

(71 Pages)

	<u>Pages</u>
4A Gross (External) Findings	1 - 19
4B Visceral (Including Craniofacial) Findings.	1 - 29
4C Skeletal Findings	1 - 23

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
GROSS FETAL EXAMINATION AT TIME OF LAPAROTOMY

SL 042671

FEMALES FROM G - 0 PPM	IMPLANT #	SEX	FETAL GROSS OBSERVATION
15946	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	M	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5 LF# 5	F	NO REMARKABLE OBSERVATIONS
	6 LF# 6	M	NO REMARKABLE OBSERVATIONS
	7 LF# 7	F	V ECCHYMOSIS - TRUNK LEFT SIDE
	8		EARLY(W/PLACENTAL TISSUE)
	9 LF# 8	F	NO REMARKABLE OBSERVATIONS
	10 LF# 9	F	NO REMARKABLE OBSERVATIONS
	11 LF# 10	F	NO REMARKABLE OBSERVATIONS
	12 LF# 11	M	NO REMARKABLE OBSERVATIONS
	13 LF# 12	F	NO REMARKABLE OBSERVATIONS
	14 LF# 13	F	NO REMARKABLE OBSERVATIONS
15953	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	M	NO REMARKABLE OBSERVATIONS
	5 LF# 5	F	NO REMARKABLE OBSERVATIONS
	6 LF# 6	M	NO REMARKABLE OBSERVATIONS
	7 LF# 7	M	NO REMARKABLE OBSERVATIONS
	8 LF# 8	F	NO REMARKABLE OBSERVATIONS
	9 LF# 9	M	NO REMARKABLE OBSERVATIONS
	10		EARLY(W/PLACENTAL TISSUE)
15954	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4		EARLY(W/PLACENTAL TISSUE)
	5 LF# 4	F	NO REMARKABLE OBSERVATIONS
	6 LF# 5	F	NO REMARKABLE OBSERVATIONS
	7 LF# 6	F	NO REMARKABLE OBSERVATIONS
	8 LF# 7	M	NO REMARKABLE OBSERVATIONS
	9 LF# 8	M	NO REMARKABLE OBSERVATIONS
	10		EARLY(W/PLACENTAL TISSUE)
15961	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS
	3 LF# 3	M	NO REMARKABLE OBSERVATIONS
	4 LF# 4	M	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	NO REMARKABLE OBSERVATIONS
	6 LF# 6	M	NO REMARKABLE OBSERVATIONS
	7 LF# 7	M	NO REMARKABLE OBSERVATIONS
	8 LF# 8	F	NO REMARKABLE OBSERVATIONS
	9 LF# 9	F	NO REMARKABLE OBSERVATIONS

OBSERVATION CODE: M=MALFORMATION, V=VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
GROSS FETAL EXAMINATION AT TIME OF LAPAROTOMY

FEMALES FROM G - 0 PPM	IMPLANT #	SEX	FETAL GROSS OBSERVATION
15967	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	M	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	NO REMARKABLE OBSERVATIONS
	6	F	DEAD
			DEAD AND MACERATED FETUS
	7 LF# 6	M	NO REMARKABLE OBSERVATIONS
	8 LF# 7	M	NO REMARKABLE OBSERVATIONS
	9 LF# 8	F	NO REMARKABLE OBSERVATIONS
	10 LF# 9	F	NO REMARKABLE OBSERVATIONS
	11 LF# 10	F	NO REMARKABLE OBSERVATIONS
15980	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5 LF# 5	F	NO REMARKABLE OBSERVATIONS
	6 LF# 6	F	NO REMARKABLE OBSERVATIONS
	7 LF# 7	M	NO REMARKABLE OBSERVATIONS
	8 LF# 8	M	NO REMARKABLE OBSERVATIONS
	9 LF# 9	M	NO REMARKABLE OBSERVATIONS
15991	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2		EARLY(W/PLACENTAL TISSUE)
	3 LF# 2	M	V ECCHYMOSIS - TRUNK
			EXTERNAL GENITALIA
	4 LF# 3	F	NO REMARKABLE OBSERVATIONS
	5 LF# 4	M	NO REMARKABLE OBSERVATIONS
	6 LF# 5	M	NO REMARKABLE OBSERVATIONS
	7 LF# 6	M	NO REMARKABLE OBSERVATIONS
	8 LF# 7	M	NO REMARKABLE OBSERVATIONS
	9 LF# 8	M	NO REMARKABLE OBSERVATIONS
	10 LF# 9	M	NO REMARKABLE OBSERVATIONS
15993	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	V ECCHYMOSIS - EXTREMITIES
			LEFT HIND FOOT
	3		EARLY(W/PLACENTAL TISSUE)
	4 LF# 3	M	NO REMARKABLE OBSERVATIONS
	5 LF# 4	M	NO REMARKABLE OBSERVATIONS
	6 LF# 5	M	NO REMARKABLE OBSERVATIONS
	7 LF# 6	F	NO REMARKABLE OBSERVATIONS
	8 LF# 7	M	NO REMARKABLE OBSERVATIONS
	9 LF# 8	F	NO REMARKABLE OBSERVATIONS
	10 LF# 9	F	NO REMARKABLE OBSERVATIONS
15994	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS

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DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
GROSS FETAL EXAMINATION AT TIME OF LAPAROTOMY

FEMALES FROM G - 0 PPM	IMPLANT #	SEX	FETAL GROSS OBSERVATION
15994	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	NO REMARKABLE OBSERVATIONS
	6 LF# 6	F	NO REMARKABLE OBSERVATIONS
	7 LF# 7	M	NO REMARKABLE OBSERVATIONS
	8 LF# 8	F	V ECCHYMOSIS - TRUNK RIGHT FLANK ON LOWER BACK
	9 LF# 9	M	NO REMARKABLE OBSERVATIONS
16003	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
16005	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	M	NO REMARKABLE OBSERVATIONS
	4 LF# 4	M	NO REMARKABLE OBSERVATIONS
	5 LF# 5	F	NO REMARKABLE OBSERVATIONS
	6 LF# 6	F	NO REMARKABLE OBSERVATIONS
	7 LF# 7	M	NO REMARKABLE OBSERVATIONS
	8 LF# 8	M	NO REMARKABLE OBSERVATIONS
	9 LF# 9	F	NO REMARKABLE OBSERVATIONS
	10 LF# 10	M	NO REMARKABLE OBSERVATIONS
	11 LF# 11	F	NO REMARKABLE OBSERVATIONS
	12		EARLY(W/PLACENTAL TISSUE)
16006	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4		EARLY(W/PLACENTAL TISSUE)
	5 LF# 4	F	NO REMARKABLE OBSERVATIONS
	6 LF# 5	F	NO REMARKABLE OBSERVATIONS
	7 LF# 6	F	NO REMARKABLE OBSERVATIONS
	8 LF# 7	M	NO REMARKABLE OBSERVATIONS
	9		EARLY(W/PLACENTAL TISSUE)
	10 LF# 8	M	NO REMARKABLE OBSERVATIONS
16016	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS
	3 LF# 3	M	NO REMARKABLE OBSERVATIONS
	4 LF# 4	M	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	V ECCHYMOSIS - EXTREMITIES FORELIMB - BILATERAL V ECCHYMOSIS - TRUNK LOWER DORSAL BACK
	6 LF# 6	F	NO REMARKABLE OBSERVATIONS
	7 LF# 7	M	NO REMARKABLE OBSERVATIONS
	8 LF# 8	M	NO REMARKABLE OBSERVATIONS
	9 LF# 9	M	V ECCHYMOSIS - HEAD TOP OF HEAD

OBSERVATION CODE: M=MALFORMATION, V=VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
GROSS FETAL EXAMINATION AT TIME OF LAPAROTOMY

FEMALES FROM G - 0 PPM	IMPLANT #	SEX	FETAL GROSS OBSERVATION
16016	10 LF#10	M	NO REMARKABLE OBSERVATIONS
	11		EARLY(W/PLACENTAL TISSUE)
	12 LF#11	F	NO REMARKABLE OBSERVATIONS
16020	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	M	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	NO REMARKABLE OBSERVATIONS
	6 LF# 6	M	NO REMARKABLE OBSERVATIONS
	7 LF# 7	F	NO REMARKABLE OBSERVATIONS
	8 LF# 8	F	NO REMARKABLE OBSERVATIONS
	9 LF# 9	F	NO REMARKABLE OBSERVATIONS
	10 LF#10	F	NO REMARKABLE OBSERVATIONS
16025	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5 LF# 5	F	NO REMARKABLE OBSERVATIONS
	6 LF# 6	F	NO REMARKABLE OBSERVATIONS
	7 LF# 7	M	NO REMARKABLE OBSERVATIONS
	8 LF# 8	F	NO REMARKABLE OBSERVATIONS
	9 LF# 9	F	NO REMARKABLE OBSERVATIONS
	10 LF#10	M	NO REMARKABLE OBSERVATIONS
16028	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	M	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	NO REMARKABLE OBSERVATIONS
	6		EARLY(W/PLACENTAL TISSUE)
	7 LF# 6	F	NO REMARKABLE OBSERVATIONS
	8 LF# 7	M	NO REMARKABLE OBSERVATIONS
16036	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS
	3 LF# 3	M	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5 LF# 5	F	NO REMARKABLE OBSERVATIONS
	6 LF# 6	F	NO REMARKABLE OBSERVATIONS
	7 LF# 7	F	NO REMARKABLE OBSERVATIONS
	8 LF# 8	F	NO REMARKABLE OBSERVATIONS
	9 LF# 9	M	NO REMARKABLE OBSERVATIONS
	10 LF#10	F	NO REMARKABLE OBSERVATIONS
16039	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	F	V ECCHYMOSIS - TRUNK RIGHT SIDE

OBSERVATION CODE: M=MALFORMATION, V=VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
GROSS FETAL EXAMINATION AT TIME OF LAPAROTOMY

FEMALES FROM G - 0 PPM	IMPLANT #	SEX	FETAL GROSS OBSERVATION
16039	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	NO REMARKABLE OBSERVATIONS
16041	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	V ECCHYMOSIS - EXTREMITIES LEFT ARM LEFT LEG
	3	U	DEAD DEAD AND MACERATED FETUS
	4 LF# 3	M	NO REMARKABLE OBSERVATIONS
	5 LF# 4	M	NO REMARKABLE OBSERVATIONS
	6 LF# 5	F	NO REMARKABLE OBSERVATIONS
	7 LF# 6	M	V ECCHYMOSIS - TRUNK LEFT FLANK AT HIND LEG
16045	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS
	3 LF# 3	M	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5 LF# 5	F	NO REMARKABLE OBSERVATIONS
	6 LF# 6	M	NO REMARKABLE OBSERVATIONS
	7 LF# 7	F	NO REMARKABLE OBSERVATIONS
	8 LF# 8	F	NO REMARKABLE OBSERVATIONS
	9 LF# 9	M	NO REMARKABLE OBSERVATIONS
16047	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	NO REMARKABLE OBSERVATIONS
	6 LF# 6	F	NO REMARKABLE OBSERVATIONS
	7 LF# 7	M	NO REMARKABLE OBSERVATIONS
	8 LF# 8	M	NO REMARKABLE OBSERVATIONS
	9 LF# 9	M	NO REMARKABLE OBSERVATIONS
	10 LF# 10	M	NO REMARKABLE OBSERVATIONS

OBSERVATION CODE: M=MALFORMATION, V=VARIATION

SL 042676

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
GROSS FETAL EXAMINATION AT TIME OF LAPAROTOMY

FEMALES FROM I - 1000 PPM	IMPLANT #	SEX	FETAL GROSS OBSERVATION
15945	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	M	NO REMARKABLE OBSERVATIONS
	4		EARLY(W/PLACENTAL TISSUE)
	5 LF# 4	F	NO REMARKABLE OBSERVATIONS
	6 LF# 5	F	NO REMARKABLE OBSERVATIONS
	7 LF# 6	F	NO REMARKABLE OBSERVATIONS
	8 LF# 7	M	NO REMARKABLE OBSERVATIONS
	9 LF# 8	M	NO REMARKABLE OBSERVATIONS
	10 LF# 9	F	NO REMARKABLE OBSERVATIONS
15957	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS
	3 LF# 3	M	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5	F	DEAD
			DEAD AND MACERATED
	6 LF# 5	M	NO REMARKABLE OBSERVATIONS
	7 LF# 6	F	NO REMARKABLE OBSERVATIONS
15963	8 LF# 7	F	NO REMARKABLE OBSERVATIONS
	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4	U	DEAD
			DEAD AND MACERATED FETUS
	5 LF# 4	F	NO REMARKABLE OBSERVATIONS
	6 LF# 5	F	NO REMARKABLE OBSERVATIONS
15964	7	U	DEAD
			DEAD AND MACERATED FETUS
	8 LF# 6	F	NO REMARKABLE OBSERVATIONS
	1		EARLY(W/PLACENTAL TISSUE)
	2 LF# 1	M	NO REMARKABLE OBSERVATIONS
	3		EARLY(W/PLACENTAL TISSUE)
	4		EARLY(W/PLACENTAL TISSUE)
	5 LF# 2	M	NO REMARKABLE OBSERVATIONS
15965	6 LF# 3	M	NO REMARKABLE OBSERVATIONS
	7 LF# 4	M	NO REMARKABLE OBSERVATIONS
	8 LF# 5	F	NO REMARKABLE OBSERVATIONS
	9 LF# 6	M	NO REMARKABLE OBSERVATIONS
	10		EARLY(W/PLACENTAL TISSUE)
	11 LF# 7	F	NO REMARKABLE OBSERVATIONS
	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
15965	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	NO REMARKABLE OBSERVATIONS
	6	F	DEAD

OBSERVATION CODE: M=MALFORMATION, V=VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE Rabbits
GROSS FETAL EXAMINATION AT TIME OF LAPAROTOMY

FEMALES FROM I - 1000 PPM	IMPLANT #	SEX	FETAL GROSS OBSERVATION
15965	7 LF# 6	F	NO REMARKABLE OBSERVATIONS
	8 LF# 7	M	V EYE BULGE FLATTENED RIGHT
	9 LF# 8	F	NO REMARKABLE OBSERVATIONS
	10 LF# 9	M	NO REMARKABLE OBSERVATIONS
15971	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	NO REMARKABLE OBSERVATIONS
	6 LF# 6	M	NO REMARKABLE OBSERVATIONS
	7 LF# 7	F	NO REMARKABLE OBSERVATIONS
	8 LF# 8	M	NO REMARKABLE OBSERVATIONS
	9 LF# 9	M	NO REMARKABLE OBSERVATIONS
15975	1	F	DEAD
			DEAD AND MACERATED FETUS
	2 LF# 1	M	NO REMARKABLE OBSERVATIONS
	3 LF# 2	M	NO REMARKABLE OBSERVATIONS
	4 LF# 3	F	NO REMARKABLE OBSERVATIONS
	5 LF# 4	M	NO REMARKABLE OBSERVATIONS
	6 LF# 5	M	NO REMARKABLE OBSERVATIONS
	7 LF# 6	M	NO REMARKABLE OBSERVATIONS
	8 LF# 7	M	NO REMARKABLE OBSERVATIONS
	9 LF# 8	F	NO REMARKABLE OBSERVATIONS
	10 LF# 9	F	V ECCHYMOSIS - HEAD DORSAL SKULL
15981	1		EARLY(W/PLACENTAL TISSUE)
	2 LF# 1	F	NO REMARKABLE OBSERVATIONS
	3		EARLY(W/PLACENTAL TISSUE)
	4		EARLY(W/PLACENTAL TISSUE)
	5 LF# 2	M	NO REMARKABLE OBSERVATIONS
	6 LF# 3	F	NO REMARKABLE OBSERVATIONS
	7 LF# 4	M	NO REMARKABLE OBSERVATIONS
	8		EARLY(W/PLACENTAL TISSUE)
	9		EARLY(W/PLACENTAL TISSUE)
15983	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3		EARLY
	4 LF# 3	M	NO REMARKABLE OBSERVATIONS
	5 LF# 4	F	V ECCHYMOSIS - TRUNK EXTERNAL GENITALIA
	6 LF# 5	M	NO REMARKABLE OBSERVATIONS
	7 LF# 6	M	NO REMARKABLE OBSERVATIONS
15986	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2		EARLY(W/PLACENTAL TISSUE)

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DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
GROSS FETAL EXAMINATION AT TIME OF LAPAROTOMY

FEMALES FROM I - 1000 PPM	IMPLANT #	SEX	FETAL GROSS OBSERVATION
15986	3 LF# 2	F	NO REMARKABLE OBSERVATIONS
	4 LF# 3	M	NO REMARKABLE OBSERVATIONS
	5		EARLY(W/PLACENTAL TISSUE)
	6		EARLY(W/PLACENTAL TISSUE)
	7 LF# 4	F	NO REMARKABLE OBSERVATIONS
	8		EARLY(W/PLACENTAL TISSUE)
	9		EARLY(W/PLACENTAL TISSUE)
15996	1		EARLY(W/PLACENTAL TISSUE)
	2 LF# 1	M	NO REMARKABLE OBSERVATIONS
	3		LATE(W/FETAL TISSUE)
	4		LATE(W/FETAL TISSUE)
	5		LATE(W/FETAL TISSUE)
	6		EARLY(W/PLACENTAL TISSUE)
	7		LATE(W/FETAL TISSUE)
	8		LATE(W/FETAL TISSUE)
	9		LATE(W/FETAL TISSUE)
	10 LF# 2	M	NO REMARKABLE OBSERVATIONS
	11		EARLY(W/PLACENTAL TISSUE)
16010	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	M	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	NO REMARKABLE OBSERVATIONS
	6		EARLY(W/PLACENTAL TISSUE)
	7 LF# 6	F	NO REMARKABLE OBSERVATIONS
16015	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS
	3 LF# 3	M	NO REMARKABLE OBSERVATIONS
	4 LF# 4	M	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	NO REMARKABLE OBSERVATIONS
16026	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	M	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	NO REMARKABLE OBSERVATIONS
	6 LF# 6	M	M DOME-SHAPED HEAD SLIGHT
	7 LF# 7	F	NO REMARKABLE OBSERVATIONS
	8 LF# 8	F	NO REMARKABLE OBSERVATIONS
	9 LF# 9	F	NO REMARKABLE OBSERVATIONS
	10 LF# 10	M	NO REMARKABLE OBSERVATIONS
16030	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	M	NO REMARKABLE OBSERVATIONS

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DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
GROSS FETAL EXAMINATION AT TIME OF LAPAROTOMY

FEMALES FROM I - 1000 PPM	IMPLANT #	SEX	FETAL GROSS OBSERVATION
16030	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5	U	DEAD
			UNABLE TO EXAMINE
	6 LF# 5	M	NO REMARKABLE OBSERVATIONS
	7 LF# 6	M	NO REMARKABLE OBSERVATIONS
	8 LF# 7	M	NO REMARKABLE OBSERVATIONS
	9 LF# 8	F	NO REMARKABLE OBSERVATIONS
	10 LF# 9	M	NO REMARKABLE OBSERVATIONS
	11 LF# 10	M	NO REMARKABLE OBSERVATIONS
16037	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	NO REMARKABLE OBSERVATIONS
	6 LF# 6	F	NO REMARKABLE OBSERVATIONS
	7 LF# 7	F	NO REMARKABLE OBSERVATIONS

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DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
GROSS FETAL EXAMINATION AT TIME OF LAPAROTOMY

FEMALES FROM M - 3000 PPM	IMPLANT #	SEX	FETAL GROSS OBSERVATION
15942	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	M	V ECCHYMOSIS - HEAD CENTER OF SNOUT DORSAL SKULL
	5 LF# 5	F	NO REMARKABLE OBSERVATIONS
	6 LF# 6	F	NO REMARKABLE OBSERVATIONS
	7 LF# 7	M	M DOME-SHAPED HEAD SLIGHT
	8 LF# 8	M	NO REMARKABLE OBSERVATIONS
	9 LF# 9	F	NO REMARKABLE OBSERVATIONS
	10 LF# 10	M	NO REMARKABLE OBSERVATIONS
	11 LF# 11	M	NO REMARKABLE OBSERVATIONS
	12 LF# 12	M	NO REMARKABLE OBSERVATIONS
	13 LF# 13	M	NO REMARKABLE OBSERVATIONS
15947	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	M	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	NO REMARKABLE OBSERVATIONS
	6 LF# 6	M	NO REMARKABLE OBSERVATIONS
	7 LF# 7	M	NO REMARKABLE OBSERVATIONS
15950	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3		EARLY(W/PLACENTAL TISSUE)
	4 LF# 3	F	NO REMARKABLE OBSERVATIONS
	5		EARLY(W/PLACENTAL TISSUE)
	6 LF# 4	F	NO REMARKABLE OBSERVATIONS
	7		EARLY(W/PLACENTAL TISSUE)
	8 LF# 5	M	NO REMARKABLE OBSERVATIONS
15952	9		EARLY
	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5		EARLY(W/PLACENTAL TISSUE)
	6 LF# 5	M	NO REMARKABLE OBSERVATIONS
	7 LF# 6	M	V ECCHYMOSIS - HEAD TOP OF SNOUT
	8 LF# 7	F	V ECCHYMOSIS - HEAD TOP OF HEAD
	9 LF# 8	F	V ECCHYMOSIS - HEAD TOP OF HEAD
	10 LF# 9	M	NO REMARKABLE OBSERVATIONS

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DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
GROSS FETAL EXAMINATION AT TIME OF LAPAROTOMY

FEMALES FROM M - 3000 PPM	IMPLANT #	SEX	FETAL GROSS OBSERVATION
15956	1 LF# 1	M	V ECCHYMOSIS - EXTREMITIES RIGHT HIND LEG
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5 LF# 5	F	NO REMARKABLE OBSERVATIONS
	6 LF# 6	F	NO REMARKABLE OBSERVATIONS
	7	M	DEAD DEAD AND MACERATED FETUS INCISORS NOT ERUPTED
15958	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	M	NO REMARKABLE OBSERVATIONS
	5 LF# 5	F	NO REMARKABLE OBSERVATIONS
	6 LF# 6	F	NO REMARKABLE OBSERVATIONS
	7 LF# 7	F	NO REMARKABLE OBSERVATIONS
	8 LF# 8	F	NO REMARKABLE OBSERVATIONS
	9 LF# 9	M	NO REMARKABLE OBSERVATIONS
	10 LF# 10	M	NO REMARKABLE OBSERVATIONS
	11 LF# 11	F	NO REMARKABLE OBSERVATIONS
15960	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	M	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5		EARLY(W/PLACENTAL TISSUE)
	6 LF# 5	M	NO REMARKABLE OBSERVATIONS
	7 LF# 6	M	NO REMARKABLE OBSERVATIONS
	8 LF# 7	M	NO REMARKABLE OBSERVATIONS
	9 LF# 8	M	NO REMARKABLE OBSERVATIONS
	10 LF# 9	F	NO REMARKABLE OBSERVATIONS
	11 LF# 10	M	NO REMARKABLE OBSERVATIONS
	12 LF# 11	M	NO REMARKABLE OBSERVATIONS
15968	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	NO REMARKABLE OBSERVATIONS
	6 LF# 6	M	NO REMARKABLE OBSERVATIONS
	7 LF# 7	M	NO REMARKABLE OBSERVATIONS
	8 LF# 8	M	NO REMARKABLE OBSERVATIONS
15979	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS

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DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
GROSS FETAL EXAMINATION AT TIME OF LAPAROTOMY

FEMALES FROM M - 3000 PPM	IMPLANT #	SEX	FETAL GROSS OBSERVATION
15979	5 LF# 5	F	NO REMARKABLE OBSERVATIONS
	6 LF# 6	M	NO REMARKABLE OBSERVATIONS
	7 LF# 7	M	NO REMARKABLE OBSERVATIONS
	8 LF# 8	F	NO REMARKABLE OBSERVATIONS
	9 LF# 9	M	NO REMARKABLE OBSERVATIONS
	10		EARLY(W/PLACENTAL TISSUE)
	11 LF#10	M	NO REMARKABLE OBSERVATIONS
	12 LF#11	F	V ECCHYMOSIS - EXTREMITIES TIP OF TAIL
15987	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS
15988	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	NO REMARKABLE OBSERVATIONS
	6 LF# 6	F	NO REMARKABLE OBSERVATIONS
	7 LF# 7	F	NO REMARKABLE OBSERVATIONS
	8 LF# 8	F	NO REMARKABLE OBSERVATIONS
	9 LF# 9	F	NO REMARKABLE OBSERVATIONS
15995	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3	M	DEAD
			DEAD AND MACERATED FETUS
	4 LF# 3	F	NO REMARKABLE OBSERVATIONS
	5 LF# 4	F	NO REMARKABLE OBSERVATIONS
	6 LF# 5	F	NO REMARKABLE OBSERVATIONS
	7 LF# 6	M	NO REMARKABLE OBSERVATIONS
	8 LF# 7	F	NO REMARKABLE OBSERVATIONS
15998	1	U	DEAD
			UNABLE TO EXAMINE
	2	U	DEAD
			UNABLE TO EXAMINE
	3	U	DEAD
			UNABLE TO EXAMINE
	4	U	DEAD
			UNABLE TO EXAMINE
	5	U	DEAD
			UNABLE TO EXAMINE
	6	U	DEAD
			UNABLE TO EXAMINE
	7	U	DEAD
			UNABLE TO EXAMINE
	8 LF# 1	F	NO REMARKABLE OBSERVATIONS
	9	U	DEAD
			UNABLE TO EXAMINE
	10	U	DEAD
			UNABLE TO EXAMINE

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DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
GROSS FETAL EXAMINATION AT TIME OF LAPAROTOMY

FEMALES FROM M - 3000 PPM	IMPLANT #	SEX	FETAL GROSS OBSERVATION
15998	11 LF# 2	F	V ECCHYMOSIS - HEAD TOP OF HEAD
16011	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS
	3 LF# 3	M	NO REMARKABLE OBSERVATIONS
	4 LF# 4	M	NO REMARKABLE OBSERVATIONS
	5 LF# 5	F	NO REMARKABLE OBSERVATIONS
	6 LF# 6	F	NO REMARKABLE OBSERVATIONS
	7 LF# 7	F	NO REMARKABLE OBSERVATIONS
	8 LF# 8	M	NO REMARKABLE OBSERVATIONS
16013	1		EARLY(W/PLACENTAL TISSUE)
	2 LF# 1	F	NO REMARKABLE OBSERVATIONS
	3 LF# 2	F	NO REMARKABLE OBSERVATIONS
	4 LF# 3	F	NO REMARKABLE OBSERVATIONS
	5	U	DEAD
	6 LF# 4	F	NO REMARKABLE OBSERVATIONS
	7 LF# 5	F	NO REMARKABLE OBSERVATIONS
	8 LF# 6	M	NO REMARKABLE OBSERVATIONS
	9 LF# 7	M	NO REMARKABLE OBSERVATIONS
	10 LF# 8	M	NO REMARKABLE OBSERVATIONS
	11 LF# 9	M	NO REMARKABLE OBSERVATIONS
	12 LF#10	M	NO REMARKABLE OBSERVATIONS
16018	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	M	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	V ECCHYMOSIS - HEAD TOP OF HEAD
	5 LF# 5	F	NO REMARKABLE OBSERVATIONS
	6 LF# 6	M	NO REMARKABLE OBSERVATIONS
	7 LF# 7	F	NO REMARKABLE OBSERVATIONS
	8 LF# 8	M	NO REMARKABLE OBSERVATIONS
	9 LF# 9	F	NO REMARKABLE OBSERVATIONS
	10 LF#10	F	NO REMARKABLE OBSERVATIONS
	11 LF#11	M	NO REMARKABLE OBSERVATIONS
	12 LF#12	F	NO REMARKABLE OBSERVATIONS
16021	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS
	3 LF# 3	M	NO REMARKABLE OBSERVATIONS
	4 LF# 4	M	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	NO REMARKABLE OBSERVATIONS
16032	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	M	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS

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DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
GROSS FETAL EXAMINATION AT TIME OF LAPAROTOMY

FEMALES FROM M - 3000 PPM	IMPLANT #	SEX	FETAL GROSS OBSERVATION
16032	5 LF# 5	F	NO REMARKABLE OBSERVATIONS
	6 LF# 6	F	NO REMARKABLE OBSERVATIONS
	7 LF# 7	M	NO REMARKABLE OBSERVATIONS
	8 LF# 8	M	NO REMARKABLE OBSERVATIONS
	9 LF# 9	M	NO REMARKABLE OBSERVATIONS
	10 LF# 10	M	NO REMARKABLE OBSERVATIONS
	11 LF# 11	F	NO REMARKABLE OBSERVATIONS
16034	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS
	3 LF# 3	M	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	NO REMARKABLE OBSERVATIONS
	6 LF# 6	F	NO REMARKABLE OBSERVATIONS
	7 LF# 7	M	NO REMARKABLE OBSERVATIONS
	8 LF# 8	F	NO REMARKABLE OBSERVATIONS
	9 LF# 9	M	NO REMARKABLE OBSERVATIONS
16049	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	V ECCHYMOSIS - EXTREMITIES RIGHT HIND FOOT
	4 LF# 4	M	V ECCHYMOSIS - TRUNK BASE OF SPINE
	5 LF# 5	M	NO REMARKABLE OBSERVATIONS
	6 LF# 6	M	NO REMARKABLE OBSERVATIONS
	7 LF# 7	F	NO REMARKABLE OBSERVATIONS
	8 LF# 8	M	NO REMARKABLE OBSERVATIONS
	9 LF# 9	F	NO REMARKABLE OBSERVATIONS

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DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
GROSS FETAL EXAMINATION AT TIME OF LAPAROTOMY

FEMALES FROM R - 6000 PPM	IMPLANT #	SEX	FETAL GROSS OBSERVATION
15948	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	NO REMARKABLE OBSERVATIONS
	6 LF# 6	M	NO REMARKABLE OBSERVATIONS
	7 LF# 7	F	NO REMARKABLE OBSERVATIONS
	8 LF# 8	M	NO REMARKABLE OBSERVATIONS
15951	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5 LF# 5	F	NO REMARKABLE OBSERVATIONS
	6 LF# 6	M	NO REMARKABLE OBSERVATIONS
	7 LF# 7	M	NO REMARKABLE OBSERVATIONS
	8 LF# 8	M	NO REMARKABLE OBSERVATIONS
	9 LF# 9	M	NO REMARKABLE OBSERVATIONS
	10 LF# 10	F	V ECCHYMOSIS - HEAD TOP OF HEAD
15955	1		EARLY(W/PLACENTAL TISSUE)
	2 LF# 1	F	NO REMARKABLE OBSERVATIONS
	3 LF# 2	F	NO REMARKABLE OBSERVATIONS
	4 LF# 3	F	NO REMARKABLE OBSERVATIONS
	5		EARLY(W/PLACENTAL TISSUE)
	6 LF# 4	M	NO REMARKABLE OBSERVATIONS
	7 LF# 5	F	V ECCHYMOSIS - EXTREMITIES LEFT HIND LEG AT KNEE
	8 LF# 6	M	NO REMARKABLE OBSERVATIONS
	9		EARLY(W/PLACENTAL TISSUE)
15959	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	M	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	NO REMARKABLE OBSERVATIONS
	6 LF# 6	M	NO REMARKABLE OBSERVATIONS
	7 LF# 7	M	NO REMARKABLE OBSERVATIONS
15972	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	M	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	NO REMARKABLE OBSERVATIONS
	6	U	DEAD
	7 LF# 6	M	DEAD AND MACERATED FETUS NO REMARKABLE OBSERVATIONS
	8 LF# 7	F	V ECCHYMOSIS - HEAD ABOVE LEFT EYE

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DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE Rabbits
GROSS FETAL EXAMINATION AT TIME OF LAPAROTOMY

FEMALES FROM R - 6000 PPM	IMPLANT #	SEX	FETAL GROSS OBSERVATION
15972	8 LF# 7		V ECCHYMOSIS - EXTREMITIES LEFT FRONT PAW
	9	M	DEAD DEAD AND MACERATED FETUS
	10 LF# 8	M	V ECCHYMOSIS - TRUNK LOWER BACK
15978	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS
	3 LF# 3	M	NO REMARKABLE OBSERVATIONS
	4 LF# 4	M	NO REMARKABLE OBSERVATIONS
	5 LF# 5	F	NO REMARKABLE OBSERVATIONS
	6 LF# 6	F	NO REMARKABLE OBSERVATIONS
	7 LF# 7	M	V ECCHYMOSIS - HEAD LEFT SIDE IF SNOUT
	8 LF# 8	M	NO REMARKABLE OBSERVATIONS
15982	1 LF# 1	F	V ECCHYMOSIS - HEAD TOP OF HEAD
	2 LF# 2	M	V ECCHYMOSIS - HEAD TOP OF HEAD
	3 LF# 3	F	V ECCHYMOSIS - HEAD TOP OF HEAD
	4		EARLY(W/PLACENTAL TISSUE)
	5 LF# 4	F	M SNOUT SHORT M MICROGATHIA V EYE BULGE FLATTENED BILATERAL M FOREPAWS RIGIDLY FLEXED - BILATERAL PALMS DOWNWARD M INVERSION - LEFT HINDPAW
	6 LF# 5	F	NO REMARKABLE OBSERVATIONS
	7 LF# 6	F	NO REMARKABLE OBSERVATIONS
15984	1 LF# 1	F	V ECCHYMOSIS - EXTREMITIES RIGHT HIND LEG
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	M DOME-SHAPED HEAD SLIGHT V ECCHYMOSIS - EXTREMITIES RIGHT HINDPAW DIGITS
	6 LF# 6	M	NO REMARKABLE OBSERVATIONS
	7 LF# 7	F	NO REMARKABLE OBSERVATIONS
	8 LF# 8	F	NO REMARKABLE OBSERVATIONS
	9 LF# 9	F	NO REMARKABLE OBSERVATIONS
	10 LF# 10	F	NO REMARKABLE OBSERVATIONS

OBSERVATION CODE: M=MALFORMATION, V=VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE Rabbits
GROSS FETAL EXAMINATION AT TIME OF LAPAROTOMY

FEMALES FROM R - 6000 PPM	IMPLANT #	SEX	FETAL GROSS OBSERVATION
15989	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	M	NO REMARKABLE OBSERVATIONS
	4 LF# 4	M	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	NO REMARKABLE OBSERVATIONS
	6 LF# 6	M	NO REMARKABLE OBSERVATIONS
	7 LF# 7	F	NO REMARKABLE OBSERVATIONS
	8 LF# 8	F	NO REMARKABLE OBSERVATIONS
	9 LF# 9	F	NO REMARKABLE OBSERVATIONS
	10 LF# 10	M	NO REMARKABLE OBSERVATIONS
15999	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5 LF# 5	M	NO REMARKABLE OBSERVATIONS
	6 LF# 6	F	NO REMARKABLE OBSERVATIONS
	7 LF# 7	M	NO REMARKABLE OBSERVATIONS
	8 LF# 8	M	NO REMARKABLE OBSERVATIONS
16001	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2		EARLY(W/PLACENTAL TISSUE)
	3 LF# 2	F	NO REMARKABLE OBSERVATIONS
	4 LF# 3	M	NO REMARKABLE OBSERVATIONS
	5 LF# 4	M	V ECCHYMOSIS - EXTREMITIES RIGHT THIGH
	6 LF# 5	M	NO REMARKABLE OBSERVATIONS
	7 LF# 6	F	NO REMARKABLE OBSERVATIONS
16007	1 LF# 1	M	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	M	NO REMARKABLE OBSERVATIONS
	4 LF# 4	M	NO REMARKABLE OBSERVATIONS
	5 LF# 5	F	NO REMARKABLE OBSERVATIONS
	6 LF# 6	M	NO REMARKABLE OBSERVATIONS
	7 LF# 7	M	NO REMARKABLE OBSERVATIONS
	8 LF# 8	F	NO REMARKABLE OBSERVATIONS
	9 LF# 9	F	NO REMARKABLE OBSERVATIONS
16009	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	M	NO REMARKABLE OBSERVATIONS
	5 LF# 5	F	NO REMARKABLE OBSERVATIONS
	6 LF# 6	F	NO REMARKABLE OBSERVATIONS
16014	1 LF# 1	M	V ECCHYMOSIS - HEAD SNOUT
	2 LF# 2	F	NO REMARKABLE OBSERVATIONS

OBSERVATION CODE: M=MALFORMATION, V=VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
GROSS FETAL EXAMINATION AT TIME OF LAPAROTOMY

FEMALES FROM R - 6000 PPM	IMPLANT #	SEX	FETAL GROSS OBSERVATION
16014	3 LF# 3	M	NO REMARKABLE OBSERVATIONS
	4 LF# 4	M	V ECCHYMOSIS - HEAD TOP OF HEAD
	5 LF# 5	F	NO REMARKABLE OBSERVATIONS
	6 LF# 6	M	NO REMARKABLE OBSERVATIONS
	7 LF# 7	F	NO REMARKABLE OBSERVATIONS
	8 LF# 8	M	NO REMARKABLE OBSERVATIONS
	9 LF# 9	M	NO REMARKABLE OBSERVATIONS
	10 LF# 10	F	V ECCHYMOSIS - HEAD TOP OF SNOUT
16019	1		LATE(W/FETAL TISSUE)
	2		EARLY(W/PLACENTAL TISSUE)
	3		EARLY(W/PLACENTAL TISSUE)
	4 LF# 1	F	NO REMARKABLE OBSERVATIONS
	5 LF# 2	M	NO REMARKABLE OBSERVATIONS
	6	M	DEAD DEAD AND MACERATED FETUS DARK BROWN
	7 LF# 3	M	NO REMARKABLE OBSERVATIONS
	8 LF# 4	F	NO REMARKABLE OBSERVATIONS
	9		EARLY(W/PLACENTAL TISSUE)
	10	U	DEAD DEAD AND MACERATED FETUS
16022	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	M	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5		EARLY(W/PLACENTAL TISSUE)
	6 LF# 5	M	NO REMARKABLE OBSERVATIONS
16023	1		EARLY(W/PLACENTAL TISSUE)
	2 LF# 1	F	NO REMARKABLE OBSERVATIONS
	3 LF# 2	F	NO REMARKABLE OBSERVATIONS
	4 LF# 3	F	NO REMARKABLE OBSERVATIONS
	5 LF# 4	F	NO REMARKABLE OBSERVATIONS
	6 LF# 5	F	NO REMARKABLE OBSERVATIONS
	7		EARLY(W/PLACENTAL TISSUE)
16033	1		EARLY(W/PLACENTAL TISSUE)
	2		EARLY(W/PLACENTAL TISSUE)
	3 LF# 1	M	NO REMARKABLE OBSERVATIONS
	4 LF# 2	F	NO REMARKABLE OBSERVATIONS
	5 LF# 3	M	NO REMARKABLE OBSERVATIONS
	6 LF# 4	M	NO REMARKABLE OBSERVATIONS
16040	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS

OBSERVATION CODE: M=MALFORMATION, V=VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
GROSS FETAL EXAMINATION AT TIME OF LAPAROTOMY

FEMALES FROM R - 6000 PPM	IMPLANT #	SEX	FETAL GROSS OBSERVATION
16040	3 LF# 3	M	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5 LF# 5	F	NO REMARKABLE OBSERVATIONS
	6 LF# 6	F	NO REMARKABLE OBSERVATIONS
	7 LF# 7	M	NO REMARKABLE OBSERVATIONS
	8 LF# 8	M	NO REMARKABLE OBSERVATIONS
	9 LF# 9	M	NO REMARKABLE OBSERVATIONS
	10 LF# 10	M	NO REMARKABLE OBSERVATIONS
16044	1 LF# 1	F	NO REMARKABLE OBSERVATIONS
	2 LF# 2	M	NO REMARKABLE OBSERVATIONS
	3 LF# 3	F	NO REMARKABLE OBSERVATIONS
	4 LF# 4	F	NO REMARKABLE OBSERVATIONS
	5 LF# 5	F	NO REMARKABLE OBSERVATIONS
	6		EARLY(W/PLACENTAL TISSUE)
	7		EARLY(W/PLACENTAL TISSUE)
	8 LF# 6	F	NO REMARKABLE OBSERVATIONS
	9 LF# 7	F	NO REMARKABLE OBSERVATIONS
	10 LF# 8	F	NO REMARKABLE OBSERVATIONS

OBSERVATION CODE: M=MALFORMATION, V=VARIATION

SL 042690

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE Rabbits
FETAL VISCERAL FINDINGS

DAMS FROM GROUP 1: G - 0 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
15946	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	V SPLEEN PALE	P
		V THIRD VENTRICLE DILATED - NO DEPRESSION	1
	6	NO REMARKABLE OBSERVATIONS	
	7	V SPLEEN PALE	P
	9	NO REMARKABLE OBSERVATIONS	
	10	V FETAL ATELECTASIS	P
	11	NO REMARKABLE OBSERVATIONS	
	12	NO REMARKABLE OBSERVATIONS	
	13	NO REMARKABLE OBSERVATIONS	
	14	NO REMARKABLE OBSERVATIONS	
15953	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
	9	NO REMARKABLE OBSERVATIONS	
15954	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
		NO REMARKABLE OBSERVATIONS	

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

DAMS FROM GROUP 1: G - 0 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
15954	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
	9	NO REMARKABLE OBSERVATIONS	
15961	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	V FETAL ATELECTASIS	P
	9	V IRREGULAR RUGAE	P
15967	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
	9	NO REMARKABLE OBSERVATIONS	
	10	NO REMARKABLE OBSERVATIONS	
	11	NO REMARKABLE OBSERVATIONS	
15980	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	V AZYGOS LUNG LOBE MISSING	P
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

DAMS FROM GROUP 1: G - 0 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
15980	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	V AZYGOS LUNG LOBE MISSING	P
	9	V AZYGOS LUNG LOBE MISSING	P
15991	1	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	V IRREGULAR RUGAE	P
	5	V AZYGOS LUNG LOBE MISSING	P
	6	V IRREGULAR RUGAE	P
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
15993	9	NO REMARKABLE OBSERVATIONS	
	10	NO REMARKABLE OBSERVATIONS	
	1	V LATERAL VENTRICLE DILATED - NO DEPRESSION BILATERAL	1
	2	NO REMARKABLE OBSERVATIONS	
	4	M LATERAL VENTRICLE DILATED - TISSUE DEPRESSED BILATERAL	1
	5	NO REMARKABLE OBSERVATIONS	
	6	M LATERAL VENTRICLE DILATED - TISSUE DEPRESSED BILATERAL	1
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
	9	NO REMARKABLE OBSERVATIONS	
15994	1	NO REMARKABLE OBSERVATIONS	

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

DAMS FROM GROUP 1: G - 0 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
15994	2	NO REMARKABLE OBSERVATIONS	
	3	M LATERAL VENTRICLE DILATED - TISSUE DEPRESSED BILATERAL	P
	4	NO REMARKABLE OBSERVATIONS	
	5	M LATERAL VENTRICLE DILATED - TISSUE DEPRESSED BILATERAL	P
		V THIRD VENTRICLE DILATED - NO DEPRESSION	1
		M CAVITATION ORAL CAVITY FLOOR OF ORAL CAVITY WHERE NASOPHARYNX IS LOCATED , EXTENDING ANTERIORLY. (4mm X 2mm x 2mm DEEP)	P
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
16003	9	M LATERAL VENTRICLE DILATED - TISSUE DEPRESSED RIGHT PRESENT, LEFT SLIGHT	P
	1	M LATERAL VENTRICLE DILATED - TISSUE DEPRESSED BILATERAL	1
		V THIRD VENTRICLE DILATED - NO DEPRESSION	1
	2	NO REMARKABLE OBSERVATIONS	
	3	M LATERAL VENTRICLE DILATED - TISSUE DEPRESSED BILATERAL	1
		V THIRD VENTRICLE DILATED - NO DEPRESSION	1
16005	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	M GALLBLADDER MISSING	P
	6	V AZYGOS LUNG LOBE MISSING	P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

SL 042694

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

DAMS FROM GROUP 1: G - 0 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
16005	7	V AZYGOS LUNG LOBE MISSING	P
	8	NO REMARKABLE OBSERVATIONS	
	9	NO REMARKABLE OBSERVATIONS	
	10	NO REMARKABLE OBSERVATIONS	
	11	NO REMARKABLE OBSERVATIONS	
16006	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
	10	NO REMARKABLE OBSERVATIONS	
16016	1	M LATERAL VENTRICLE DILATED - TISSUE DEPRESSED BILATERAL	P
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	P
	4	NO REMARKABLE OBSERVATIONS	
	5	V AZYGOS LUNG LOBE MISSING	1
	6	NO REMARKABLE OBSERVATIONS	
	7	M LATERAL VENTRICLE DILATED - TISSUE DEPRESSED LEFT	1
		V LATERAL VENTRICLE DILATED - NO DEPRESSION RIGHT	
	8	NO REMARKABLE OBSERVATIONS	1
	9	V THIRD VENTRICLE DILATED - NO DEPRESSION	
	10	NO REMARKABLE OBSERVATIONS	
	12	NO REMARKABLE OBSERVATIONS	

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

DAMS FROM GROUP 1: G - 0 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
16020	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	V THIRD VENTRICLE DILATED - NO DEPRESSION	1
		V LATERAL VENTRICLE DILATED - NO DEPRESSION	1
		BILATERAL	
	9	NO REMARKABLE OBSERVATIONS	
	10	V THYMUS DARK RED	P
		V LATERAL VENTRICLE DILATED - NO DEPRESSION	1
16025		BILATERAL	
	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
	9	NO REMARKABLE OBSERVATIONS	
	10	NO REMARKABLE OBSERVATIONS	
16028	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

DAMS FROM GROUP 1: G - 0 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
16028	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
16036	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
	9	NO REMARKABLE OBSERVATIONS	
	10	NO REMARKABLE OBSERVATIONS	
16039	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
16041	1	NO REMARKABLE OBSERVATIONS	
	2	V LATERAL VENTRICLE DILATED - NO DEPRESSION LEFT	1
		V THIRD VENTRICLE DILATED - NO DEPRESSION	1
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

SL 042697

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

DAMS FROM GROUP 1: G - 0 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
16045	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
	9	NO REMARKABLE OBSERVATIONS	
16047	1	NO REMARKABLE OBSERVATIONS	
	2	V AZYGOS LUNG LOBE MISSING	P
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	M LATERAL VENTRICLE DILATED - TISSUE DEPRESSED LEFT	1
	7	NO REMARKABLE OBSERVATIONS	
	8	V LATERAL VENTRICLE DILATED - NO DEPRESSION RIGHT	1
	9	NO REMARKABLE OBSERVATIONS	
	10	NO REMARKABLE OBSERVATIONS	

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

DAMS FROM GROUP 2: I - 1000 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
15945	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
	9	NO REMARKABLE OBSERVATIONS	
	10	NO REMARKABLE OBSERVATIONS	
15957	1	V IRREGULAR RUGAE	P
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	6	V IRREGULAR RUGAE	P
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
15963	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	5	V LATERAL VENTRICLE DILATED - NO DEPRESSION BILATERAL	1
	6	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
15964	2	V DARK BROWN MATERIAL AMONG BRAIN SECTIONS BILATERAL LATERAL VENTRICLES M CAVITATION IN MEDULLA	P P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

DAMS FROM GROUP 2: I - 1000 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
15964	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
	9	NO REMARKABLE OBSERVATIONS	
	11	NO REMARKABLE OBSERVATIONS	
15965	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	V LATERAL VENTRICLE DILATED - NO DEPRESSION BILATERAL	1
	4	NO REMARKABLE OBSERVATIONS	
	5	V FETAL ATELECTASIS	P
		M FOURTH VENTRICLE MISSING	P
		V DARK BROWN AREA OF BRAIN TISSUE IN MEDULLA AND EXTENDS INTO THALAMUS 5.0 MM IN DIAMETER. ENTIRE DARK BROWN AREA HAS A MORE SPONGY AND FRIABLE TEXTURE THAN NORMAL BRAIN TISSUE	P
		M POSTERIOR PORTION OF CEREBELLUM SCRAMBLED	P
	7	NO REMARKABLE OBSERVATIONS	
	8	V DARK BROWN AREA OF BRAIN TISSUE TWO AREAS 2.0 MM IN DIAMETER ON EACH SIDE OF THE THALAMUS AND CEREBELLUM.	P
	9	M VENTRICULAR SEPTAL DEFECT LARGE MEMBRANOUS AND MUSCULAR	P
		M SEMILUNAR VALVES OF THE PULMONARY ARTERY MISSING	P
		M SEMILUNAR VALVES OF THE AORTA MISSING	P
		M RIGHT VENTRICLE OF THE HEART SMALL	P
		M HOLE IN EXTERIOR OF LEFT ATRIUM LARGE HOLE, NO BLOOD PRESENT IN PERICARDIUM. APPEARS TO BE	P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE Rabbits
FETAL VISCERAL FINDINGS

DAMS FROM GROUP 2: I - 1000 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
15965	9	OPEN INTO THE LEFT VENTRICLE.	
		V LEFT ATRIUM PALE	P
		WAS PALE BENEATH THE PERICARDIUM AND REMAINED PALE AFTER PERICARDIUM WAS REMOVED	
		M PAPILLARY MUSCLES MISSING - RIGHT VENTRICLE	P
		M ENLARGED AORTA	P
		V SMALL BUT PATENT DUCTUS ARTERIOSUS	P
15971	10	V RIGHT SUBCLAVIAN ARTERY SMALL	P
		NO REMARKABLE OBSERVATIONS	
		V LATERAL VENTRICLE DILATED - NO DEPRESSION	1
		BILATERAL	
		NO REMARKABLE OBSERVATIONS	
		NO REMARKABLE OBSERVATIONS	
		NO REMARKABLE OBSERVATIONS	
		V IRREGULAR RUGAE	P
		NO REMARKABLE OBSERVATIONS	
		NO REMARKABLE OBSERVATIONS	
15975	9	NO REMARKABLE OBSERVATIONS	
		NO REMARKABLE OBSERVATIONS	
		NO REMARKABLE OBSERVATIONS	
		NO REMARKABLE OBSERVATIONS	
		NO REMARKABLE OBSERVATIONS	
		NO REMARKABLE OBSERVATIONS	
		NO REMARKABLE OBSERVATIONS	
		NO REMARKABLE OBSERVATIONS	
		NO REMARKABLE OBSERVATIONS	
		NO REMARKABLE OBSERVATIONS	
	10	V THIRD VENTRICLE DILATED - NO DEPRESSION	1

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

DAMS FROM GROUP 2: 1 - 1000 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
15981	2	NO REMARKABLE OBSERVATIONS	
	5	M LATERAL VENTRICLE DILATED - TISSUE DEPRESSED BILATERAL	P
	6	NO REMARKABLE OBSERVATIONS	
	7	M LATERAL VENTRICLE DILATED - TISSUE DEPRESSED BILATERAL	P
15983	1	NO REMARKABLE OBSERVATIONS	
	2	V AZYGOS LUNG LOBE MISSING	P
	4	NO REMARKABLE OBSERVATIONS	
	5	V FETAL ATELECTASIS	P
	6	NO REMARKABLE OBSERVATIONS	
	7	V LATERAL VENTRICLE DILATED - NO DEPRESSION BILATERAL	1
15986	1	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	7	V DARK BROWN MATERIAL AMONG BRAIN SECTIONS BILATERAL LATERAL VENTRICLES	P
		V THIRD VENTRICLE DILATED - NO DEPRESSION	1
15996	2	NO REMARKABLE OBSERVATIONS	
	10	NO REMARKABLE OBSERVATIONS	
16010	1	NO REMARKABLE OBSERVATIONS	
	2	M LATERAL VENTRICLE DILATED - TISSUE DEPRESSED BILATERAL	P
	3	NO REMARKABLE OBSERVATIONS	

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION.

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

DAMS FROM GROUP 2: I - 1000 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
16010	4	V LATERAL VENTRICLE DILATED - NO DEPRESSION BILATERAL	1
	5	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
16015	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	M LATERAL VENTRICLE DILATED - TISSUE DEPRESSED BILATERAL	P
	4	NO REMARKABLE OBSERVATIONS	
	5	M LATERAL VENTRICLE DILATED - TISSUE DEPRESSED BILATERAL	1
16026	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	M TEETH PRIMORDIA MISSING RIGHT	P
	9	NO REMARKABLE OBSERVATIONS	
	10	NO REMARKABLE OBSERVATIONS	
16030	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	V LATERAL VENTRICLE DILATED - NO DEPRESSION BILATERAL	1

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

DAMS FROM GROUP 2: I - 1000 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
16030	6	NO REMARKABLE OBSERVATIONS	P
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
	9	V IRREGULAR RUGAE	
	10	NO REMARKABLE OBSERVATIONS	
	11	NO REMARKABLE OBSERVATIONS	
16037	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

SL 042704

DAMS FROM GROUP 3: M - 3000 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
15942	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
	9	V THIRD VENTRICLE DILATED - NO DEPRESSION	1
	10	NO REMARKABLE OBSERVATIONS	
	11	V AZYGOS LUNG LOBE MISSING	P
	12	NO REMARKABLE OBSERVATIONS	
	13	NO REMARKABLE OBSERVATIONS	
15947	1	M LATERAL VENTRICLE DILATED - TISSUE DEPRESSED. BILATERAL	1
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	V LATERAL VENTRICLE DILATED - NO DEPRESSION BILATERAL	1
15950	1	V FETAL ATELECTASIS	P
	2	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	6	V FETAL ATELECTASIS M GALLBLADDER MISSING	P P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

DAMS FROM GROUP 3: M - 3000 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
15950	8	V DARK BROWN MATERIAL AMONG BRAIN SECTIONS BILATERAL LATERAL VENTRICLES	P
15952	1	NO REMARKABLE OBSERVATIONS	
	2	V SPLEEN PALE	P
	3	V SPLEEN PALE	P
	4	V SPLEEN PALE	P
	6	V SPLEEN PALE	P
	7	V SPLEEN PALE	P
	8	V SPLEEN PALE	P
	9	NO REMARKABLE OBSERVATIONS	
	10	V FETAL ATELECTASIS	P
15956	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
15958	1	V FETAL ATELECTASIS M LATERAL VENTRICLE DILATED - TISSUE DEPRESSED BILATERAL	P 1
	2	NO REMARKABLE OBSERVATIONS	
	3	V THIRD VENTRICLE DILATED - NO DEPRESSION	1
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

SL 042705

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

SL 042706

DAMS FROM GROUP 3: M - 3000 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
15958	9	V LATERAL VENTRICLE DILATED - NO DEPRESSION BILATERAL	1
		V THIRD VENTRICLE DILATED - NO DEPRESSION	1
	10	NO REMARKABLE OBSERVATIONS	
	11	V LATERAL VENTRICLE DILATED - NO DEPRESSION LEFT	1
15960	1	V FETAL ATELECTASIS	P
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	V THIRD VENTRICLE DILATED - NO DEPRESSION	1
	9	NO REMARKABLE OBSERVATIONS	
	10	NO REMARKABLE OBSERVATIONS	
	11	NO REMARKABLE OBSERVATIONS	
	12	V DARK BROWN MATERIAL AMONG BRAIN SECTIONS BILATERAL LATERAL VENTRICLES	P
15968	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
15979	1	NO REMARKABLE OBSERVATIONS	

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

SL 042707

DAMS FROM GROUP 3: M - 3000 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
15979	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
	9	M THIRD VENTRICLE DILATED - TISSUE DEPRESSED	1
	11	NO REMARKABLE OBSERVATIONS	
	12	NO REMARKABLE OBSERVATIONS	
15987	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
15988	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	M LATERAL VENTRICLE DILATED - TISSUE DEPRESSED BIALTERAL	1
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	V DILATED URETER - UNILATERAL RIGHT	P
		V DILATED RENAL PELVIS - UNILATERAL RIGHT	P
	7	V LATERAL VENTRICLE DILATED - NO DEPRESSION BILATERAL	1
	8	NO REMARKABLE OBSERVATIONS	
	9	V LATERAL VENTRICLE DILATED - NO DEPRESSION BILATERAL	1

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

DAMS FROM GROUP 3: M - 3000 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
15995	1	V IRREGULAR RUGAE	P
	2	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	V THIRD VENTRICLE DILATED - NO DEPRESSION	1
15998	8	NO REMARKABLE OBSERVATIONS	
	11	V LATERAL VENTRICLE DILATED - NO DEPRESSION LEFT	1
16011	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	V LATERAL VENTRICLE DILATED - NO DEPRESSION BILATERAL	1
	5	NO REMARKABLE OBSERVATIONS	
	6	V LATERAL VENTRICLE DILATED - NO DEPRESSION LEFT	1
	7	NO REMARKABLE OBSERVATIONS	
	8	V LATERAL VENTRICLE DILATED - NO DEPRESSION BILATERAL	1
16013	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	V AZYGOS LUNG LOBE MISSING	P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

SL 042708

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

DAMS FROM GROUP 3: M - 3000 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
16013	8	M VENTRICULAR SEPTAL DEFECT MUSCULAR	P
	9	NO REMARKABLE OBSERVATIONS	
	10	NO REMARKABLE OBSERVATIONS	
	11	NO REMARKABLE OBSERVATIONS	
	12	NO REMARKABLE OBSERVATIONS	
16018	1	NO REMARKABLE OBSERVATIONS	
	2	V IRREGULAR RUGAE	P
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
	9	NO REMARKABLE OBSERVATIONS	
	10	V LATERAL VENTRICLE DILATED - NO DEPRESSION BILATERAL	1
	11	NO REMARKABLE OBSERVATIONS	
	12	NO REMARKABLE OBSERVATIONS	
16021	1	V LATERAL VENTRICLE DILATED - NO DEPRESSION LEFT	1
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	V FETAL ATELECTASIS V LATERAL VENTRICLE DILATED - NO DEPRESSION BILATERAL	P 1

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

SL 042710

DAMS FROM GROUP 3: M - 3000 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
16032	1	NO REMARKABLE OBSERVATIONS	P
	2	NO REMARKABLE OBSERVATIONS	
	3	V AZYGOS LUNG LOBE MISSING	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
	9	NO REMARKABLE OBSERVATIONS	
	10	NO REMARKABLE OBSERVATIONS	
	11	NO REMARKABLE OBSERVATIONS	
16034	1	NO REMARKABLE OBSERVATIONS	1
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	V THIRD VENTRICLE DILATED - NO DEPRESSION	
	8	NO REMARKABLE OBSERVATIONS	
	9	NO REMARKABLE OBSERVATIONS	
16049	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

DAMS FROM GROUP 3: M - 3000 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
16049	9	V IRREGULAR RUGAE	P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

SL 042711

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

SL 042712

DAMS FROM GROUP 4: R - 6000 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
15948	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	V REDUCED NUMBER OF TEETH PRIMORDIA TWO LEFT, ZERO RIGHT	P
15951	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
	9	NO REMARKABLE OBSERVATIONS	
	10	NO REMARKABLE OBSERVATIONS	
15955	2	NO REMARKABLE OBSERVATIONS	
	3	V AZYGUS LUNG LOBE MISSING	P
	4	V DILATED RENAL PELVIS - UNILATERAL RIGHT	P
		V AZYGUS LUNG LOBE MISSING	P
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

DAMS FROM GROUP 4: R - 6000 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
15959	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
15972	1	NO REMARKABLE OBSERVATIONS	
	2	V LATERAL VENTRICLE DILATED - NO DEPRESSION RIGHT	1
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
15978	10	NO REMARKABLE OBSERVATIONS	
	1	NO REMARKABLE OBSERVATIONS	
	2	V THIRD VENTRICLE DILATED - NO DEPRESSION V IRREGULAR RUGAE	1 P
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	M ENLARGED AORTA	P
		M SMALL BUT PATENT PULMONARY ARTERY LEFT AND RIGHT PULMONARY ARTERIES AND DUCTUS ARTERIOSUS ARE NORMAL V MEMBRANOUS VENTRICULAR SEPTUM THINNED M SEMILUNAR VALVES OF THE PULMONARY ARTERY MISSING	P P P P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

DAMS FROM GROUP 4: R - 6000 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
15978	5	M SEMILUNAR VALVES OF THE AORTA MISSING	P
		M RIGHT VENTRICLE OF THE HEART SMALL	P
		M LEFT VENTRICLE OF THE HEART ENLARGED	-
	6	NO REMARKABLE OBSERVATIONS	
15982	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
	1	V AZYGUS LUNG LOBE MISSING	P
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	5	V AZYGUS LUNG LOBE MISSING	P
		M LATERAL VENTRICLE DILATED - TISSUE DEPRESSED BILATERAL	1
15984	6	NO REMARKABLE OBSERVATIONS	
	7	V AZYGUS LUNG LOBE MISSING	P
	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	V AZYGUS LUNG LOBE MISSING	P
15989	9	NO REMARKABLE OBSERVATIONS	
	10	V THIRD VENTRICLE DILATED - NO DEPRESSION	1
	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

DAMS FROM GROUP 4: R - 6000 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
15989	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
	9	NO REMARKABLE OBSERVATIONS	
	10	NO REMARKABLE OBSERVATIONS	
15999	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
16001	8	NO REMARKABLE OBSERVATIONS	
	1	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	V LATERAL VENTRICLE DILATED - NO DEPRESSION BILATERAL	1
	6	V PARTIAL FETAL ATELECTASIS	P
	7	NO REMARKABLE OBSERVATIONS	
16007	1	M VENTRICULAR SEPTAL DEFECT MEMBRANOUS	P
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	M VENTRICULAR SEPTAL DEFECT	P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

DAMS FROM GROUP 4: R - 6000 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
16007		MEMBRANOUS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	M ECTOPIC TESTIS	P
		LEFT - TOWARD KIDNEY	
		RIGHT - CAUDALLY, LYING NEXT TO URINARY BLADDER	
		V RIGHT TESTIS THIN WITH NO CHARACTERISTIC SHAPE	P
	8	NO REMARKABLE OBSERVATIONS	
	9	NO REMARKABLE OBSERVATIONS	
16009	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	V LATERAL VENTRICLE DILATED - NO DEPRESSION BILATERAL	1
		V THIRD VENTRICLE DILATED - NO DEPRESSION	1
	5	NO REMARKABLE OBSERVATIONS	
16014	6	NO REMARKABLE OBSERVATIONS	
	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
	9	NO REMARKABLE OBSERVATIONS	
	10	V AZYGUS LUNG LOBE MISSING	P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

DAMS FROM GROUP 4: R - 6000 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
16019	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	7	V DARK GREEN FLUID IN STOMACH	P
	8	V DARK GREEN FLUID IN INTESTINES V LATERAL VENTRICLE DILATED - NO DEPRESSION LEFT	P 1
16022	1	V LATERAL VENTRICLE DILATED - NO DEPRESSION BILATERAL	1
		V THIRD VENTRICLE DILATED - NO DEPRESSION	1
	2	NO REMARKABLE OBSERVATIONS	
	3	M LATERAL VENTRICLE DILATED - TISSUE DEPRESSED BILATERAL	P
		V THIRD VENTRICLE DILATED - NO DEPRESSION	1
		M CAVITATION IN MEDULLA	P
16023	4	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
16033	6	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	M LATERAL VENTRICLE DILATED - TISSUE DEPRESSED RIGHT	1
		V LATERAL VENTRICLE DILATED - NO DEPRESSION LEFT	1
		V THIRD VENTRICLE DILATED - NO DEPRESSION	1

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL VISCERAL FINDINGS

DAMS FROM GROUP 4: R - 6000 PPM	FETUS#	VISCERAL OBSERVATION	GRADE
16033	5	NO REMARKABLE OBSERVATIONS	
	6	M LATERAL VENTRICLE DILATED - TISSUE DEPRESSED BILATERAL	P
16040	1	NO REMARKABLE OBSERVATIONS	
	2	NO REMARKABLE OBSERVATIONS	
	3	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	6	V THIRD VENTRICLE DILATED - NO DEPRESSION	1
	7	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
	9	NO REMARKABLE OBSERVATIONS	
	10	NO REMARKABLE OBSERVATIONS	
16044	1	NO REMARKABLE OBSERVATIONS	
	2	M LATERAL VENTRICLE DILATED - TISSUE DEPRESSED BILATERAL	P
	3	NO REMARKABLE OBSERVATIONS	
	4	V REDUCED NUMBER OF TEETH PRIMORDIA ONE RIGHT	P
		V TEETH PRIMORDIA SMALLER THAN NORMAL	P
		M THIRD VENTRICLE DILATED - TISSUE DEPRESSED	1
	5	NO REMARKABLE OBSERVATIONS	
	8	NO REMARKABLE OBSERVATIONS	
	9	NO REMARKABLE OBSERVATIONS	
	10	NO REMARKABLE OBSERVATIONS	

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL SKELETAL FINDINGS

FEMALES FROM G - 0 PPM	IMPLANT #	SKELETAL OBSERVATION	GRADE
15946	2	V STERNEBRA #6 POORLY OSSIFIED	P
		V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - UNILATERAL RIGHT	P
		V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL LEFT	P
	4	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
		V STERNEBRA #5 POORLY OSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P
		V CERVICAL CENTRA #1,#2,#3 AND/OR #4 POORLY OSSIFIED #1	P
	6	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
		V PARIETAL - POORLY OSSIFIED BILATERAL	P
		V BODY OF THE HYOID - POORLY OSSIFIED	P
		V STERNEBRA #5 POORLY OSSIFIED	P
	9	V STERNEBRA #6 POORLY OSSIFIED	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	(P)
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
		V BODY OF THE HYOID - POORLY OSSIFIED	P
	11	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED. ONE BILATERAL	P
		V STERNEBRA #5 POORLY OSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P
		V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
	13	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
		V STERNEBRA #5 POORLY OSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P
15953	2	NO REMARKABLE OBSERVATIONS	
	4	V STERNEBRA #6 POORLY OSSIFIED	P
	6	V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION.

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DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL SKELETAL FINDINGS

FEMALES FROM G - 0 PPM	IMPLANT #	SKELETAL OBSERVATION	GRADE
15953	6	V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	8	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
15954	1	V STERNEBRA #5 UNOSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P
		V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL RIGHT	P
	3	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	6	V STERNEBRA #5 POORLY OSSIFIED	P
	8	V STERNEBRA #5 POORLY OSSIFIED	P
		V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL LEFT	P
15961	2	V STERNEBRAE #4 AND #5 FUSED	P
		V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	4	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	6	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	8	V STERNEBRA #5 POORLY OSSIFIED	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
15967	1	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	3	V STERNEBRA #6 POORLY OSSIFIED	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	5	V CERVICAL CENTRA #1, #2, #3 AND/OR #4 POORLY OSSIFIED #1	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	8	NO REMARKABLE OBSERVATIONS	
	10	V STERNEBRA #6 POORLY OSSIFIED	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
		V CERVICAL CENTRA #1, #2, #3 AND/OR #4 POORLY OSSIFIED #1	P
15980	2	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	4	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	6	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	8	V STERNEBRA #6 POORLY OSSIFIED	P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE Rabbits
FETAL SKELETAL FINDINGS

FEMALES FROM G - 0 PPM	IMPLANT #	SKELETAL OBSERVATION	GRADE
15991	3	NO REMARKABLE OBSERVATIONS	
	5	NO REMARKABLE OBSERVATIONS	
	7	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	9	V EXTRA RIB #13 - FIRST LUMBAR ARCH - UNILATERAL RIGHT	P
		V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL LEFT	P
15993	2	NO REMARKABLE OBSERVATIONS	
	5	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
		M RIB #11 - MISSING - UNILATERAL LEFT	P
		M THORACIC ARCH MISSING - UNILATERAL #11 LEFT	P
		M THORACIC CENTRUM AND ARCHES DIAGONALLY DISPLACED #10 AND #12	P
		M LUMBAR CENTRUM AND ARCHES DIAGONALLY DISPLACED #1	P
		V THORACIC CENTRUM #11 POORLY OSSIFIED ONLY ONE OSSIFICATION CENTER	3
	7	V STERNEBRA #6 POORLY OSSIFIED	P
		V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL LEFT	P
	9	NO REMARKABLE OBSERVATIONS	
15994	2	V STERNEBRA #5 POORLY OSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	4	V STERNEBRA #5 POORLY OSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	6	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	8	V STERNEBRA #5 POORLY OSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P
		V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
16003	2	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
16005	2	V STERNEBRA #5 POORLY OSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL SKELETAL FINDINGS

FEMALES FROM G - 0 PPM	IMPLANT #	SKELETAL OBSERVATION	GRADE
16005	2	V RUDIMENTARY RIB #13 - THORACIC ARCH #13 - UNILATERAL LEFT	P
	4	V STERNEBRA #5 POORLY OSSIFIED	P
	6	V STERNEBRA #5 UNOSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P
	8	V PARIETAL - POORLY OSSIFIED BILATERAL	P
		V PARIETAL - HOLE IN BONE BILATERAL	P
		V STERNEBRA #5 POORLY OSSIFIED	P
	10	V STERNEBRA #6 POORLY OSSIFIED	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
16006	1	V STERNEBRA #5 POORLY OSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	3	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	6	V STERNEBRA #5 POORLY OSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	8	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
16016		V LUMBAR CENTRUM #7 POORLY OSSIFIED	P
	2	V STERNEBRAE #4 AND #5 FUSED	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - UNILATERAL LEFT	P
	4	NO REMARKABLE OBSERVATIONS	
	6	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	8	V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL RIGHT	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - UNILATERAL LEFT	P
	10	NO REMARKABLE OBSERVATIONS	
16020	1	V STERNEBRA #6 POORLY OSSIFIED	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	3	V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL RIGHT	P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL SKELETAL FINDINGS

FEMALES FROM G - 0 PPM	IMPLANT #	SKELETAL OBSERVATION	GRADE
16020	3	V EXTRA RIB #13 - FIRST LUMBAR ARCH - UNILATERAL LEFT	P
	5	V STERNEBRA #6 POORLY OSSIFIED	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
	7	V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	9	NO REMARKABLE OBSERVATIONS	
16025		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	1	NO REMARKABLE OBSERVATIONS	
	3	V STERNEBRA #5 POORLY OSSIFIED	P
	5	NO REMARKABLE OBSERVATIONS	
16028	7	NO REMARKABLE OBSERVATIONS	
	9	V STERNEBRA #6 POORLY OSSIFIED	P
	2	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	4	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
16036		V STERNEBRA #6 POORLY OSSIFIED	P
		V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL RIGHT	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - UNILATERAL LEFT	P
	7	V STERNEBRA #6 POORLY OSSIFIED	P
		V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL RIGHT	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - UNILATERAL LEFT	P
	1	V STERNEBRA #6 POORLY OSSIFIED	P
	3	V STERNEBRA #5 POORLY OSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	5	V BODY OF THE HYOID - POORLY OSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P
	7	V STERNEBRA #5 POORLY OSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL SKELETAL FINDINGS

FEMALES FROM G - 0 PPM	IMPLANT #	SKELETAL OBSERVATION	GRADE
16036	9	V STERNEBRA #5 POORLY OSSIFIED V STERNEBRA #6 POORLY OSSIFIED V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL LEFT	P P P
16039	2	V EXTRA #13 THORACIC CENTRUM AND ARCHES V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P P
	4	V EXTRA #13 THORACIC CENTRUM AND ARCHES V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P P
16041	1	V EXTRA #13 THORACIC CENTRUM AND ARCHES V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P P
	4	V EXTRA #13 THORACIC CENTRUM AND ARCHES V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P P
	6	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
16045	2	V STERNEBRA #5 POORLY OSSIFIED V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL LEFT	P P
	4	V STERNEBRA #2 POORLY OSSIFIED V STERNEBRA #5 POORLY OSSIFIED V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL RIGHT	P P P
	6	V STERNEBRA #5 POORLY OSSIFIED	P
	8	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
16047	1	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	3	V EXTRA #13 THORACIC CENTRUM AND ARCHES V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P P
	5	V EXTRA #13 THORACIC CENTRUM AND ARCHES V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P P
	7	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	9	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL V THORACIC CENTRUM #6 BILOBED V THORACIC CENTRUM #7 BILOBED V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL RIGHT V EXTRA RIB #13 - FIRST LUMBAR ARCH - UNILATERAL LEFT	P P P P P P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL SKELETAL FINDINGS

FEMALES FROM I - 1000 PPM	IMPLANT #	SKELETAL OBSERVATION	GRADE
15945	2	V STERNEBRA #5 POORLY OSSIFIED	P
	5	V STERNEBRA #5 POORLY OSSIFIED	P
	7	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
		V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
	9	V STERNEBRA #5 POORLY OSSIFIED	P
		V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
15957	2	V MAXILLARY - POORLY OSSIFIED RIGHT	P
	4	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
		V STERNEBRA #5 POORLY OSSIFIED	P
	7	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
		V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL LEFT	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - UNILATERAL RIGHT	P
15963	1	NO REMARKABLE OBSERVATIONS	
	3	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
	6	V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
15964	5	NO REMARKABLE OBSERVATIONS	
	7	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	9	NO REMARKABLE OBSERVATIONS	
15965	2	V EXTRA OSSIF. SITE ABOVE STERNEBRA SEGMENT #1	P
	4	V STERNEBRA #5 POORLY OSSIFIED	P
	7	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - UNILATERAL LEFT	P
	9	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL SKELETAL FINDINGS

FEMALES FROM 1 - 1000 PPM	IMPLANT #	SKELETAL OBSERVATION	GRADE
15971	2	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
	4	V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	6	V STERNEBRA #5 POORLY OSSIFIED	P
	8	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V RUDIMENTARY RIB #13 - THORACIC ARCH #13 - BILATERAL	P
		V STERNEBRA #5 POORLY OSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P
15975	3	V STERNEBRA #5 UNOSSIFIED	P
	5	V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	7	V STERNEBRA #5 POORLY OSSIFIED	P
	9	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
		V STERNEBRA #5 POORLY OSSIFIED	P
		V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL RIGHT	P
15981	2	NO REMARKABLE OBSERVATIONS	
	6	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
15983	1	V CERVICAL CENTRA #1,#2,#3 AND/OR #4 POORLY OSSIFIED #1	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - UNILATERAL RIGHT	P
		V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL LEFT	P
	4	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
	6	V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
15986	1	NO REMARKABLE OBSERVATIONS	
	4	V STERNEBRA #5 POORLY OSSIFIED	P
15996	2	NO REMARKABLE OBSERVATIONS	
16010	1	NO REMARKABLE OBSERVATIONS	
	3	V EXTRA RIB #13 - FIRST LUMBAR ARCH - UNILATERAL RIGHT	P
	5	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
16015	2	V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL	P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL SKELETAL FINDINGS

FEMALES FROM I - 1000 PPM	IMPLANT #	SKELETAL OBSERVATION	GRADE
16015	4	RIGHT V FRONTAL BONE - POORLY OSSIFIED LEFT V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL V RUDDIMENTARY RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P P P
16026	1	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
	3	V EXTRA #13 THORACIC CENTRUM AND ARCHES V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL V STERNEBRA #6 POORLY OSSIFIED V STERNEBRA #5 POORLY OSSIFIED V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL V STERNEBRA #5 POORLY OSSIFIED V STERNEBRA #6 POORLY OSSIFIED V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL V EXTRA #13 THORACIC CENTRUM AND ARCHES V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL V EXTRA #13 THORACIC CENTRUM AND ARCHES V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P P P P P P P P P P P P
16030	1	V BODY OF THE HYOID - POORLY OSSIFIED V STERNEBRA #6 UNOSSIFIED V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL V EXTRA #13 THORACIC CENTRUM AND ARCHES V CERVICAL CENTRA #1,#2,#3 AND/OR #4 POORLY OSSIFIED #1	P P P P P
	3	V BODY OF THE HYOID - POORLY OSSIFIED V STERNEBRA #6 POORLY OSSIFIED V EXTRA RIB #13 - FIRST LUMBAR ARCH - UNILATERAL RIGHT V RUDDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL LEFT	P P P P
	6	NO REMARKABLE OBSERVATIONS	
	8	V BODY OF THE HYOID - POORLY OSSIFIED	P
	10	V EXTRA #13 THORACIC CENTRUM AND ARCHES V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL V BODY OF THE HYOID - POORLY OSSIFIED	P P P
16037	2	V STERNEBRA #5 POORLY OSSIFIED V STERNEBRA #6 POORLY OSSIFIED	P P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL SKELETAL FINDINGS

FEMALES FROM I - 1000 PPM	IMPLANT #	SKELETAL OBSERVATION	GRADE
16037	2	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	4	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	6	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL SKELETAL FINDINGS

FEMALES FROM M - 3000 PPM	IMPLANT #	SKELETAL OBSERVATION	GRADE
15942	2	V STERNEBRA #5 POORLY OSSIFIED	P
		V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL RIGHT	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - UNILATERAL LEFT	P
	4	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED BILATERAL	P
		V STERNEBRA #5 UNOSSIFIED	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
		V PARIETAL - POORLY OSSIFIED BILATERAL	P
	6	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED BILATERAL	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	8	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
15947	10	V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
	12	V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	2	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
		V THORACIC CENTRUM #6 BILOBED	P
		V THORACIC CENTRUM #2 SPLIT	P
		V THORACIC CENTRUM #3 SPLIT	P
		V THORACIC CENTRUM #4 SPLIT	P
		V THORACIC CENTRUM #5 SPLIT	P
		M THORACIC ARCH MISSING - UNILATERAL #3 LEFT	P
		M THORACIC CENTRUM AND ARCHES DIAGONALLY DISPLACED #2, #3, #4 AND #5	P
		M THORACIC ARCHES FUSED - UNILATERAL #4 TO #5 LEFT	P
		M RIB #3 MISSING - UNILATERAL LEFT	P
		M EXTRA RIB BETWEEN EXISTING RIBS - UNILATERAL BETWEEN #4 AND #5 RIGHT	P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL SKELETAL FINDINGS

FEMALES FROM M - 3000 PPM	IMPLANT #	SKELETAL OBSERVATION	GRADE
15947	6	M RIBS #2 THROUGH #5 FUSED #2 TO #3 RIGHT #4 TO #5 BILATERAL	P
15950	2	V BODY OF THE HYOID - POORLY OSSIFIED V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED BILATERAL V STERNEBRA #5 POORLY OSSIFIED V STERNEBRA #6 POORLY OSSIFIED V EXTRA #13 THORACIC CENTRUM AND ARCHES V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL V LUMBAR ARCHES #6 POORLY OSSIFIED BILATERAL	P P P P P P P
	6	V BODY OF THE HYOID - POORLY OSSIFIED V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED BILATERAL V STERNEBRA #2 POORLY OSSIFIED V STERNEBRA #5 POORLY OSSIFIED V STERNEBRA #6 POORLY OSSIFIED V STERNEBRAE #1 AND #2 FUSED V STERNEBRAE #4 AND #5 FUSED	P P P P P P P
15952	2	V EXTRA #13 THORACIC CENTRUM AND ARCHES V EXTRA RIB #13 - THORACIC ARCH #13 - UNILATERAL LEFT	P P
	4	V BODY OF THE HYOID - POORLY OSSIFIED V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED TWO BILATERAL V STERNEBRA #6 UNOSSIFIED V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL V CERVICAL CENTRA #1,#2,#3 AND/OR #4 POORLY OSSIFIED #1	P P P P P
	7	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED TWO BILATERAL V CERVICAL CENTRA #1,#2,#3 AND/OR #4 POORLY OSSIFIED #1 V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL LEFT	P P P
	9	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL V EXTRA #13 THORACIC CENTRUM AND ARCHES V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P P P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL SKELETAL FINDINGS

FEMALES FROM M - 3000 PPM	IMPLANT #	SKELETAL OBSERVATION	GRADE
15956	1	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V RUDIMENTARY RIB #13 - THORACIC ARCH #13 - UNILATERAL RIGHT	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - UNILATERAL LEFT	P
	3	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
	5	V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
		V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
15958	2	NO REMARKABLE OBSERVATIONS	
	4	NO REMARKABLE OBSERVATIONS	
	6	NO REMARKABLE OBSERVATIONS	
	8	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
	10	V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
		V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
15960	2	V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL RIGHT	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL LEFT	3
		V STERNEBRA #5 POORLY OSSIFIED	P
	4	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	7	V STERNEBRA #5 POORLY OSSIFIED	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
		V CERVICAL CENTRA #1,#2,#3 AND/OR #4 POORLY OSSIFIED #1	P
	9	V STERNEBRA #5 POORLY OSSIFIED	P
	11	V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
		V STERNEBRA #5 POORLY OSSIFIED	P
		V CERVICAL CENTRA #1,#2,#3 AND/OR #4 POORLY OSSIFIED #1	P
15968	1	V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
		V BODY OF THE HYOID - POORLY OSSIFIED	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	3	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	5	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL SKELETAL FINDINGS

FEMALES FROM M - 3000 PPM	IMPLANT #	SKELETAL OBSERVATION	GRADE
15968	7	NO REMARKABLE OBSERVATIONS	
15979	2	V STERNEBRA #5 POORLY OSSIFIED	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	4	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	6	V PARIETAL - HOLE IN BONE LEFT	P
		V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE LEFT	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	8	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	11	V STERNEBRA #5 POORLY OSSIFIED	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
15987	1	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
15988	2	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	4	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	6	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	8	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
15995	2	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	5	V STERNEBRA #5 POORLY OSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	7	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
15998	8	NO REMARKABLE OBSERVATIONS	
16011	1	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
		V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
	3	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL SKELETAL FINDINGS

FEMALES FROM M - 3000 PPM	IMPLANT #	SKELETAL OBSERVATION	GRADE
16011	3	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
	5	V STERNEBRA #5 POORLY OSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
		V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
	7	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
16013	2	V STERNEBRA #5 UNOSSIFIED	P
	4	V FRONTAL BONE - POORLY OSSIFIED BILATERAL	P
	7	V STERNEBRA #5 POORLY OSSIFIED	P
		V STERNEBRA #5 POORLY OSSIFIED	P
		V STERNEBRA #5 POORLY OSSIFIED	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
16018	11	V STERNEBRA #5 POORLY OSSIFIED	P
	1	V STERNEBRA #5 POORLY OSSIFIED	P
		V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
		V STERNEBRA #5 POORLY OSSIFIED	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
		V LUMBAR ARCHES #1 POORLY OSSIFIED BILATERAL	P
	3	V LUMBAR ARCHES #2 POORLY OSSIFIED BILATERAL	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	7	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
		V STERNEBRA #5 POORLY OSSIFIED	P
	9	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
16021	11	V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	2	NO REMARKABLE OBSERVATIONS	
		V MAXILLARY - POORLY OSSIFIED BILATERAL	P
		V STERNEBRA #5 POORLY OSSIFIED	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL SKELETAL FINDINGS

FEMALES FROM M - 3000 PPM	IMPLANT #	SKELETAL OBSERVATION	GRADE
16021	4	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
		V STERNEBRA #5 POORLY OSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
16032	2	V STERNEBRA #5 POORLY OSSIFIED	P
	4	NO REMARKABLE OBSERVATIONS	
	6	V STERNEBRA #5 UNOSSIFIED	P
	8	NO REMARKABLE OBSERVATIONS	
	10	V STERNEBRA #6 POORLY OSSIFIED	P
16034	2	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	4	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	6	V STERNEBRA #5 POORLY OSSIFIED	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	8	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
16049	2	V STERNEBRA #5 POORLY OSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P
		V CERVICAL CENTRA #1,#2,#3 AND/OR #4 POORLY OSSIFIED #1	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - UNILATERAL RIGHT	P
	4	V STERNEBRA #5 POORLY OSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - UNILATERAL LEFT	P
	6	V MAXILLARY - POORLY OSSIFIED BILATERAL	P
		V STERNEBRA #5 POORLY OSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	8	V STERNEBRA #5 POORLY OSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE Rabbits
FETAL SKELETAL FINDINGS

FEMALES FROM R - 6000 PPM	IMPLANT #	SKELETAL OBSERVATION	GRADE
15948	1	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	3	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	5	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	7	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
15951		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	3	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	5	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	7	V STERNEBRA #6 POORLY OSSIFIED	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	9	V STERNEBRA #6 POORLY OSSIFIED	P
15955	2	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	4	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	7	V THORACIC CENTRUM #6 BILOBED	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
15959		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	2	V STERNEBRA #5 POORLY OSSIFIED	P
		V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL RIGHT	P
	4	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL SKELETAL FINDINGS

FEMALES FROM R - 6000 PPM	IMPLANT #	SKELETAL OBSERVATION	GRADE
15959	6	V STERNEBRA #5 POORLY OSSIFIED V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P P
15972	1	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	3	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	5	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	8	V FRONTAL BONE - POORLY OSSIFIED BILATERAL	P
		V PARIETAL - POORLY OSSIFIED BILATERAL	P
		V INTERPARIETAL - POORLY OSSIFIED	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
15978	1	V EXTRA RIB #13 - FIRST LUMBAR ARCH - UNILATERAL LEFT	P
	3	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	5	V STERNEBRA #5 POORLY OSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P
		V CERVICAL CENTRA #1, #2, #3 AND/OR #4 POORLY OSSIFIED #1	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	7	V STERNEBRA #6 POORLY OSSIFIED	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
15982	1	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
		V STERNEBRA #5 POORLY OSSIFIED	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	3	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
		V STERNEBRA #5 UNOSSIFIED	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	6	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED	P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

SL 042737

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL SKELETAL FINDINGS

FEMALES FROM R - 6000 PPM	IMPLANT #	SKELETAL OBSERVATION	GRADE
15982	6	ONE BILATERAL V EXTRA #13 THORACIC CENTRUM AND ARCHES V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P P
15984	1	V STERNEBRA #5 POORLY OSSIFIED V STERNEBRA #6 POORLY OSSIFIED V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL RIGHT	P P P
	3	V STERNEBRA #5 UNOSSIFIED V STERNEBRA #6 POORLY OSSIFIED V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P P P
	5	V BODY OF THE HYOID - POORLY OSSIFIED V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P P P
	7	V STERNEBRA #5 POORLY OSSIFIED V STERNEBRA #6 UNOSSIFIED V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P P P P P
	9	V STERNEBRA #6 POORLY OSSIFIED V EXTRA RIB #13 - FIRST LUMBAR ARCH - UNILATERAL LEFT	P P
15989	1	V STERNEBRA #5 POORLY OSSIFIED V THORACIC CENTRUM #6 BILOBED	P P
	3	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL V EXTRA #13 THORACIC CENTRUM AND ARCHES V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P P P P P
	5	V EXTRA #13 THORACIC CENTRUM AND ARCHES V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P P P P
	7	V STERNEBRA #5 POORLY OSSIFIED V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P P P P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES V EXTRA RIB #13 - THORACIC ARCH #13 - UNILATERAL RIGHT	P P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL SKELETAL FINDINGS

FEMALES FROM R - 6000 PPM	IMPLANT #	SKELETAL OBSERVATION	GRADE
15989	7	V RUDIMENTARY RIB #13 - THORACIC ARCH #13 - UNILATERAL LEFT	P
	9	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
		V STERNEBRA #5 POORLY OSSIFIED	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
15999	1	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	3	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	5	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	7	V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL LEFT	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - UNILATERAL RIGHT	P
16001	1	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	4	V STERNEBRA #6 POORLY OSSIFIED	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	6	V STERNEBRA #5 POORLY OSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P
16007		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
	2	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	4	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	6	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
	8	V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
16009	1	V STERNEBRA #6 POORLY OSSIFIED	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	3	V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
		V MAXILLARY - POORLY OSSIFIED BILATERAL	P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

SL 042738

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL SKELETAL FINDINGS

FEMALES FROM R - 6000 PPM	IMPLANT #	SKELETAL OBSERVATION	GRADE
16009	5	V EXTRA #13 THORACIC CENTRUM AND ARCHES V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P P
16014	1	V BODY OF THE HYOID - POORLY OSSIFIED V EXTRA #13 THORACIC CENTRUM AND ARCHES V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P P P
	3	V CERVICAL CENTRA #1,#2,#3 AND/OR #4 POORLY OSSIFIED #1 V EXTRA THORACIC ARCH BETWEEN EXISTING ARCHES BETWEEN THORACIC ARCHES #8 AND #9 - RIGHT V EXTRA ARCH SMALL EXTRA ARCH SMALLER THAN NORMAL M RIB #10 - FORKED - UNILATERAL RIGHT - IN ASSOCIATION WITH THE EXTRA THORACIC ARCH	P P P P P P
	5	V CERVICAL CENTRA #1,#2,#3 AND/OR #4 POORLY OSSIFIED #1 V EXTRA #13 THORACIC CENTRUM AND ARCHES V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P P P
	7	V CERVICAL CENTRA #1,#2,#3 AND/OR #4 POORLY OSSIFIED #1 V RUDIMENTARY RIB #13 - FIRST LUMBAR ARCH - UNILATERAL RIGHT V EXTRA RIB #13 - FIRST LUMBAR ARCH - UNILATERAL LEFT V THORACIC CENTRUM #7 BILOBED V STERNEBRA #5 POORLY OSSIFIED V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P P P P P P
16019	4	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL V STERNEBRA #5 UNOSSIFIED V STERNEBRA #6 POORLY OSSIFIED V EXTRA #13 THORACIC CENTRUM AND ARCHES V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P P P P P
	7	V STERNEBRA #5 UNOSSIFIED V EXTRA RIB #13 - FIRST LUMBAR ARCH - UNILATERAL RIGHT	P P
16022	2	V EXTRA #13 THORACIC CENTRUM AND ARCHES V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P P
	4	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

SL 042739

SL 042740

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

DEVELOPMENTAL TOXICITY STUDY OF INHALED 1,1,1-TRICHLOROETHANE
IN NEW ZEALAND WHITE RABBITS
FETAL SKELETAL FINDINGS

FEMALES FROM R - 6000 PPM	IMPLANT #	SKELETAL OBSERVATION	GRADE
16040	1	V BODY OF THE HYOID - POORLY OSSIFIED	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	3	V BODY OF THE HYOID - POORLY OSSIFIED	P
		V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
	5	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
		V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	7	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	9	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
16044		V STERNEBRA #5 POORLY OSSIFIED	P
		V STERNEBRA #6 POORLY OSSIFIED	P
	1	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED TWO BILATERAL	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	3	V MAJORITY INTER.PHALANGES (FORELIMB) POORLY OSSIFIED THREE BILATERAL	P
		V SOME INTER.PHALANGES (HINDLIMB) POORLY OSSIFIED ONE BILATERAL	P
		V EXTRA #13 THORACIC CENTRUM AND ARCHES	P
		V EXTRA RIB #13 - THORACIC ARCH #13 - BILATERAL	P
	5	V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P
	9	V SOME INTER.PHALANGES (FORELIMB) POORLY OSSIFIED ONE BILATERAL	P
		V STERNEBRA #6 POORLY OSSIFIED	P
		V EXTRA RIB #13 - FIRST LUMBAR ARCH - BILATERAL	P

GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT, M-MALFORMATION V-VARIATION

SL 042741

APPENDIX 5

Protocols and Amendments

(39 Pages)



BUSHY RUN RESEARCH CENTER

R. D. 4, Mellon Road, Export, Pennsylvania 15632

Telephone (412) 733-5200

PROTOCOL

TITLE: Developmental Toxicity Study of Inhaled 1,1,1-Trichloroethane
in New Zealand White Rabbits

BRRC PROJECT NUMBER: 86-95-80604

SPONSOR: Halogenated Solvents Industry Alliance
1612 K Street, NW, Suite 300
Washington, DC 20006

TESTING FACILITY: Bushy Run Research Center (BRRC)
R.D. #4, Mellon Road
Export, PA 15632
Attention: R. W. Tyl
(412) 733-5277

Reviewed and Approved by:

Bushy Run Research Center:

Rochelle W. Tyl 7/14/86
Rochelle W. Tyl, Ph.D., DABT Date
Study Director/Manager
Reproductive and Developmental
Toxicology Section

Linda J. Calisfi 7/14/86
Linda J. Calisfi, B.S., Date
Group Leader, Good Laboratory
Practices/Quality Assurance

Fred R. Frank 7/20/86
Fred R. Frank, Ph.D. Date
Director

Sponsor:

James A. Barter 7/29/86
James A. Barter, Ph.D., DABT Date

0619P-2

SL 042743

Bushy Run Research Center
A Joint Mellon Institute—Union Carbide Corporation Operation

Developmental Toxicity Study of Inhaled 1,1,1-Trichloroethane
in New Zealand White Rabbits

PURPOSE

The purpose of this study is to evaluate the potential for developmental toxicity of the test article administered by inhalation of the vapor during organogenesis in pregnant New Zealand white rabbits as required by the U. S. Environmental Protection Agency under Section 4(a) of the Toxic Substances Control Act and promulgated in the final test rule for 1,1,1-trichloroethane under 40 CFR Part 999.4400.

MATERIALS AND METHODS

Test Article

Liquid 1,1,1-trichloroethane (methylchloroform, TCEA; CAS No. 71-55-6) stabilized with less than 0.1% butylene oxide (1,2-epoxybutane; CAS No. 106-88-7) will be used. The test chemical, supplied by Dow Chemical USA, Texas Operations, Freeport, TX, arrived at BRRRC on June 25, 1986 in three 55-gallon sealed drums bearing the Lot. No. TA8606182. It received the BRRRC No. 49-228 A, B, and C. Pertinent chemical and physical properties of the test chemical are presented in Attachment 1.

Purity and Stability

A compositional analysis of the liquid 1,1,1-trichloroethane to be used for this study will be performed by the Sponsor prior to the exposure period. A sample will be sent to the Sponsor at the end of the exposure period for compositional analysis to affirm stability.

Handling Precautions

Precautions will be undertaken to avoid contact of the test chemical to the clothing, skin or eyes. Rubber or plastic gloves and safety glasses will always be used in handling this compound.

Cleaning Contaminated Equipment: Equipment contaminated with the test chemical will be cleaned with acetone.

Storage Conditions: The test material will be kept in a chemical storage area. Samples used for the study will be stored in one-gallon glass bottles blanketed with nitrogen and kept in an exhaust hood. A reserve sample will be taken and kept at BRRRC.

Animals

One hundred eight (108) virgin female New Zealand white rabbits (2.5 - 3.5 kg, approximately 5 1/2 months old) will be ordered from Hazelton Dutchland Laboratories, Inc. (Denver, PA). Male New Zealand white rabbits from the BRRRC breeding colony will be used for breeding. The New Zealand white rabbit (a

lagamorph) has been selected due to its consistent high fecundity in various laboratories and known incidence of spontaneous malformations (Woo and Hoar, 1982; Stadler *et al.*, 1983). In addition, the gestational stages and morphogenic process of this species, as well as its sensitivity to known teratogens have been described extensively in the literature (Nishimura and Shiota, 1977; Hartman, 1974; Desesso and Jordan, 1977; McClain and Langhoff, 1980; Palmer, 1978). A data base for historical controls is available for this rabbit strain in this laboratory with regard to reproductive indices and incidence of fetal malformations and variations.

Quarantine Period

All animals will be housed in BRRRC animal rooms 105 (breeding colony males) and 102 (for study females). The animals will be received at least two weeks before the initiation of the mating period. During the quarantine period the animals will be observed regularly for general health status and ability to adapt to the watering system. Body weights will be ascertained at least once prior to the mating period. Female rabbits in good health at least 2.5 kg in weight will be used for this study.

Quality Control

Quality control will be performed upon the receipt of the animals. Rabbits will be examined by a veterinarian and rabbit fecal samples will be analyzed for intestinal parasites. The quality control evaluation of these animals will be used to determine their health status.

Husbandry

During the quarantine period, rabbits will be housed individually in stainless steel wire-mesh cages mounted in steel racks. After mating, females will be housed one per cage in stainless steel wire-mesh cages mounted in steel racks. Deotized® paperboard (Shepherd Specialty Papers, Inc., Kalamazoo, MI) will be placed under each row of cages to collect solid and liquid excreta. An automatic watering system with demand control valves mounted on each rack will provide water for the rabbits. Water and food will be available *ad libitum* at all times except during exposures. The light cycle in these rooms will be 12 hours light/12 hours dark. Specific information on the cages (dimensions, etc.) will be included in the study data. The study females will be housed in Room 102 for acclimation, breeding, prior to, between and after the exposures until scheduled sacrifice on gd 29.

Animal Identification

Each rabbit will be assigned a unique number and will be identified with a Monel® metal ear tag (Gey Band and Tag Co., Morristown, PA).

Temperature and Relative Humidity

Temperature and relative humidity will be recorded continuously for each animal holding room. Room temperature will be maintained at $19 \pm 3^{\circ}\text{C}$, and relative humidity will be maintained between 40% and 60%.

Food and Water

The water available to the animals will be tap water (Municipal Authority of Westmoreland County, Greensburg, PA). The incoming water was analyzed for contaminants by the NUS Corporation (Pittsburgh, PA). The water quality analyses performed per EPA specifications included the 129 "priority" pollutants, which were identified in the Federal Register, Vol. 45, No. 98 Appendix D, Part 122. The food available to the rabbits will be Prolab Certified Rabbit Food® (Agway Inc., St. Marys, OH). The analyses of the food for possible contaminants (including nitrosamine) will be performed by the supplier. Results of water and food analyses will be reviewed by the Study Director.

INHALATION CHAMBER OPERATION

The animals will be exposed by inhalation since that is the probable route of human exposure and this was the route employed in the exposure range-finding study.

Chambers

Four, approximately 4300-liter stainless steel chambers with glass doors and windows for animal observation will be employed, located in Room 139. Air sampling probes will be positioned in the areas of animal placement.

Airflow

Chambers will be provided with filtered air at a flow rate of approximately 750-1000 liters/min (approximately 12-14 air changes per hour). All chambers will be maintained at a slight negative pressure to prevent any vapor from entering the room.

Chamber Temperature and Relative Humidity

Temperature and relative humidity will be recorded at least every 30 minutes during each exposure using a maximum-minimum thermometer (Abbeon Cal., Inc., Sant Barbara, CA) and an Airguide Humidity Indicator (Airguide Instrument Co., Chicago, IL), respectively.

Cage Position and Rotation During Exposure

In case of undetected differences in environment or 1,1,1-trichloroethane concentration within the chamber, all exposure cage positions will be rotated daily. A description of the rotation will be provided in the raw data.

Vapor Generation

The liquid test article will be metered from a piston or pump (Fluid Metering Inc., Oyster Bay, NY) into a heated glass evaporator similar in design as described by Carpenter *et al.* (1975). Temperatures in the evaporator will be maintained at the lowest level sufficient to vaporize the liquid. The resultant vapor will be carried into the chambers by a counter current air stream which enters the bottom of the evaporator.

Analysis of Chamber Atmosphere

Chamber concentrations will be determined approximately once each hour by a gas chromatographic technique. The chamber sample probes will be placed in the breathing zone of the animals. The daily nominal (estimated) chamber concentrations will also be reported.

Mating

New Zealand white rabbit females (at least 2.5 kg and 5 1/2-6 months old) will be mated to "proven", fertile males from the BRRC breeding colony. Following copulation, the animals will be returned to their respective cages and the date of the copulation will be designated gd 0 (Hafez, 1970). Records will be maintained on the identification numbers of each male used and any relevant comments regarding the mating of each female. Mated female rabbits will be housed individually.

Successfully mated females will be randomly assigned to one of three 1,1,1-trichloroethane exposure groups or a control group by a stratified randomization procedure by body weight on gd 0. Each treatment group will consist of twenty-four (24) mated female rabbits.

Exposure Groups

The target concentrations for the three 1,1,1-trichloroethane-exposed groups will be added to the protocol by amendment based on the results of the exposure range-finding study. The negative control group (animals handled the same as the 1,1,1-trichloroethane-exposed animals) will be exposed to ambient air only (0 ppm).

Length of Exposures

Rabbits will be exposed on gd 6 through 18 (13 consecutive days) for 6 hours/day.

Maternal Weights

Maternal weights will be recorded on gd 0, 6, 9, 12, 15, 19 and 29. All weights taken during the treatment period will be obtained prior to daily exposure.

Maternal Observations

All study females will be observed daily from gd 0 to scheduled sacrifice for any clinical signs of toxicity.

Maternal Sacrifice and Laparotomy

Rabbits will be sacrificed on gd 29. Rabbits will be euthanized by intravenous injection of T-61 euthanasia solution (Hoechst Corp., Somerville, NJ) into the marginal ear vein. The maternal body cavities will be opened by a midline thoracolaparotomy. The gravid uteri, ovaries (including corpora lutea), cervixes, vagina, and peritoneal and thoracic cavities of each pregnant

animal will be examined grossly. Ovarian corpora lutea of pregnancy will be counted, and maternal liver weight will be determined. Sections of maternal liver and nasal turbinates will be preserved in neutral buffered 10% formalin for possible subsequent histologic examination. The gravid uteri will be immediately ligated at their cervical end to prevent the expulsion of concepti by myometrial peristalsis. The ligated uteri with ovaries and oviducts attached will be externally examined for signs of hemorrhage and then removed from the peritoneal cavity, weighed, and dissected longitudinally to expose the contents. All live and dead fetuses and resorption sites will be recorded. Uteri from females that appear nongravid will be placed in a 10% ammonium sulfide solution for confirmation of pregnancy status (Salewski, 1964).

All live rabbit fetuses will be immediately euthanized by intraperitoneal injection of sodium pentobarbital and then will be weighed and examined for external malformations and cleft palate. All of the live fetuses in each litter will be examined for thoracic and abdominal visceral abnormalities by modification of methods described by Staples (1974) and sex determined. Approximately one-half of the fetuses in each litter examined visceraally (odd numbered fetuses from litters with an odd number of live fetuses and even numbered fetuses from litters with an even number of fetuses) will be decapitated and their heads will be fixed in Bouin's solution for examination of craniofacial structures by the free-hand sectioning method modified from Wilson (1965, 1973) and van Julsingha and Bennett (1977). The remaining intact fetuses in each litter will be eviscerated, air-dried and processed for skeletal staining with alizarin red S (Crary, 1962; Peltzer and Schardein, 1966). Decapitated bodies of fetuses will also be processed for skeletal staining but will not be examined unless results warrant, with concurrence of the Sponsor and at additional cost.

Dead or Moribund Animals

A gross necropsy will be performed on all animals not surviving to the scheduled sacrifice in an attempt to determine the cause of death. Pregnancy status will be determined, if possible, by examination of uterine contents or by staining apparent nongravid uteri with 10% ammonium sulfide. Maternal tissues will be preserved for microscopic examination in neutral buffered 10% formalin only as deemed necessary by the gross findings.

Culled Animals

Animals not used in the study will be euthanized or used for methods development and training of the BRRC staff.

Statistical Analysis

The unit of comparison will be the pregnant doe or the litter (Weil, 1970). Results of the quantitative continuous variables (e.g. maternal body weights, liver weights, etc.) will be intercompared for the three exposure groups and one air-control group by use of Levene's test for equal variances (Levene, 1960), analysis of variance (ANOVA), and t-tests with Bonferroni probabilities. The t-tests will be used when the F value from the ANOVA is significant. When Levene's test indicates homogeneous variances and the ANOVA

is significant, the pooled t-test will be used for pairwise comparisons. When Levene's test indicates heterogeneous variances, all groups will be compared by an ANOVA for unequal variances (Brown and Forsythe, 1974) followed, when necessary, by the separate variance t-test.

Nonparametric data obtained following laparohysterectomy will be statistically evaluated using the Kruskal-Wallis test (Sokal and Rohlf, 1969) followed by the Mann-Whitney U test for pairwise comparisons (Sokal and Rohlf, 1969) when appropriate. Frequency data will be compared using the Fisher's Exact Test (Sokal and Rohlf, 1969). For all statistical tests, the fiducial limit of 0.05 (two-tailed) will be used as the critical level of significance.

Personnel Health and Safety

Normal safety precautions will be employed in the handling of the test article. The Sponsor will advise BRRRC of any additional precautions that should be taken.

Protocol Alterations

Alterations of this protocol may be made as the study progresses. No major changes in the protocol will be made without the specific written request or consent of the sponsor. In the event that the Sponsor authorizes a protocol change verbally, such change will be made by BRRRC. However, it then becomes the responsibility of the Sponsor to follow such verbal change with a written verification. All protocol modifications will be issued as amendments and will be signed by the Study Director and Sponsor.

Scheduling

Animals arrive at BRRRC: September 23, 1986
Acclimatization period begins: September 23, 1986
Mating period begins: October 6, 1986 (first gd 0 also October 6, 1986)
Treatment period begins: October 12, 1986
Sacrifice period begins: November 4, 1986
Draft of final report: Approximately three months after the completion of the evaluation of fetal heads and skeletons, on or about April 15, 1987.

Records and Data Retention

All records pertaining to this study will be permanently retained and placed in the BRRRC Archives upon completion of the report. All data, including reports from this study, will be retained for at least ten (10) years after completion of the study in the BRRRC Archives and will be made available for inspection upon request by authorized personnel of the sponsor. An appropriate sample of the test article will be retained for ten (10) years following completion of the study.

Good Laboratory Practice Compliance

The Bushy Run Research Center through the administration of a quality assurance program by the Good Laboratory Practices Committee and Quality Assurance Unit, assures compliance of all phases of toxicological studies with existing regulations and generally accepted good laboratory practices according to EPA (TSCA), 1983.

Study Personnel

Study Director/Manager,

Teratology Section:

Attending Veterinary Pathologist:

Pathologist:

Teratology Personnel:

R. W. Tyl, Ph.D., DABT

P. E. Losco, VMD, Diplomate ACVP

E. H. Fowler, DVM, Ph.D., Diplomate ACVP

D. L. Fait, AALAS Cert. II

K. A. France, B.A.

L. C. Fisher, B.S.

M. F. Kubena, B.S.

T. A. Rebick, A.H.T., A.S., AALAS Cert. I

D. J. McNeil, A.H.T., A.S., AALAS Cert. I.

T. A. Savine, HT(ASCP)

Inhalation Personnel:

D. E. Dodd, Ph.D., DABT, Manager Inhalation

I. M. Pritts, Ph.D.

D. R. Klonne, Ph.D.

Quality Assurance Personnel:

W. J. Kintigh, B.S., AALAS Cert. I

L. J. Calisti, B.S., AALAS Cert. III, Group Leader

J. R. Bernard, B.S.

W. J. Conroy, B.S.

Animal Care Personnel:

M. J. Cardella, AALAS Cert. III, Supervisor

In addition, other BRRC personnel may participate in this study.

Report

A report will be prepared upon completion of the study. The report (containing a summary of results from the exposure range-finding study on the test chemical conducted at BRRC in 1986) will include mean maternal body weights of pregnant animals, mean number of corpora lutea per dam, total, viable and nonviable implantations, embryonic resorptions (early, later), preimplantation losses, fetal sex ratios, mean fetal body weights, and malformations and variations observed in this study. All means will be accompanied by standard deviations. The report will include the following tables and appendices:

A.

Tables

Summary of Chamber Analyses

Animal Distribution and Fate

Summary of Maternal Body Weight and Weight Changes

Summary of Maternal Clinical Signs

Tables (Continued)

Summary of Laparohysterotomy Findings
Summary of Fetal External, Visceral (including results from craniofacial
examinations), and Skeletal Examinations
Dates of Quality Assurance inspections and report to management of
significant deviations from protocol

B.

Appendices

Protocol and Amendments(s)
Chamber Operation and Analyses
Exposure Range-Finding Study Report
Individual Animal Data for Fetal Body Weights, Fetal Malformations and Fetal
Variations

WPC/esk/0619P-2
07-01-86

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07-01-86

M A T E R I A L S A F E T Y D A T A S H E E T

Dow Chemical U.S.A. Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 55352 Page: 1

PRODUCT NAME: METHYL CHLOROFORM, LOW STABILIZED

Effective Date: 11/20/85 Date Printed: 06/21/86 MSDS:000699

1. INGREDIENTS:

1,1,1-Trichloroethane CAS# 000071-55-6 99.9%

2. PHYSICAL DATA:

BOILING POINT: 165F (74C)
VAP PRESS: 100 mmHg @ 20C
VAP DENSITY: 4.55
SOL. IN WATER: 0.07 g/100 g @ 25C
SP. GRAVITY: 1.330-1.335 @ 25/25C
APPEARANCE: Colorless liquid.
ODOR: Irritating odor at high concentrations.

3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: None
METHOD USED: TOC, TCC, COC

FLAMMABLE LIMITS
LFL: 7.5% @ 25C
UFL: 15% @ 25C

EXTINGUISHING MEDIA: Water fog.

FIRE & EXPLOSION HAZARDS: Not available.

FIRE-FIGHTING EQUIPMENT: Positive-pressure, self-contained
respiratory equipment.

(Continued on Page 2)

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SL 042754

MATERIAL SAFETY DATA SHEET

Dow Chemical U.S.A. Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 55352

Page: 2

PRODUCT NAME: METHYL CHLOROFORM, LOW STABILIZED

Effective Date: 11/20/85 Date Printed: 06/21/86

MSDS:000699

4. REACTIVITY DATA:

STABILITY: (CONDITIONS TO AVOID) Autoignition temperature 998F (537C). Avoid open flames, welding arcs, or other high temperature sources which induce thermal decomposition.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Water - slow hydrolysis produces corrosive acid. Avoid contact with or storage in aluminum and its alloys. Definitely avoid contact with metallic aluminum and zinc powders.

HAZARDOUS DECOMPOSITION PRODUCTS: Hydrogen chloride and very small amounts of phosgene and chlorine.

HAZARDOUS POLYMERIZATION: Will not occur.

5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

ACTION TO TAKE FOR SPILLS/LEAKS: Small leaks: Mop up, wipe up, or soak up immediately. Remove to out-of-doors.
Large spills: Evacuate area. Contain liquid; transfer to closed metal containers. Keep out of water supply.

DISPOSAL METHOD: When disposing of the unused contents, the preferred options are to send to licensed reclaimer, permitted incinerators, or to evaporate very small quantities in compliance with local, state, and federal regulations including Subtitle C of the Resource Conservation and Recovery Act. Dumping into sewers, on the ground, or into any body of water is strongly discouraged, and may be illegal. Consult The Dow Chemical Company for further information.

6. HEALTH HAZARD DATA:

EYE: May cause pain. May cause slight transient (temporary) irritation with slight transient corneal injury. Vapors may irritate eyes.

SKIN CONTACT: Prolonged or repeated exposure may cause skin irritation. Repeated contact may cause drying or flaking of

(Continued on Page 3)

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M A T E R I A L S A F E T Y D A T A S H E E T

Dow Chemical U.S.A. Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 55352 Page: 3

PRODUCT NAME: METHYL CHLOROFORM, LOW STABILIZED

Effective Date: 11/20/85 Date Printed: 06/21/86 MSDS:000699

6. HEALTH HAZARD DATA: (CONTINUED)

skin.

SKIN ABSORPTION: A single prolonged skin exposure is not likely to result in absorption of harmful amounts. The LD50 for rabbits is about 15,000 mg/kg.

INGESTION: Single dose oral toxicity is low. The LD50 for rats is >10,000 mg/kg. If aspirated (liquid enters the lung), may be rapidly absorbed through the lungs and result in injury to other body systems.

INHALATION: Minimal anesthetic or narcotic effects may be seen in the range of 500-1000 ppm trichloroethane. Progressively higher levels over 1000 ppm may cause dizziness, drunkenness; concentrations as low as 10,000 ppm can cause unconsciousness and death. In confined or poorly ventilated areas, vapors which readily accumulate can cause unconsciousness and death. These high levels may also cause cardiac arrhythmias (irregular heartbeats).

SYSTEMIC & OTHER EFFECTS: Based on available data, repeated exposures are not anticipated to cause any significant adverse effects. 1,1,1-Trichloroethane and similar mixtures did not cause cancer in long-term animal studies. Birth defects are unlikely. Exposures having no adverse effects on the mother should have no effect on the fetus. In animal studies, has been shown not to interfere with reproduction. Results of in vitro ('test tube') mutagenicity tests on 1,1,1-trichloroethane have been negative. Results of mutagenicity tests in animals have been negative.

7. FIRST AID:

EYES: Irrigate immediately with water for at least 5 minutes.

SKIN: Wash off in flowing water or shower. Remove contaminated clothing and wash before reuse.

INGESTION: Do not induce vomiting. Call a physician and/or

(Continued on Page 4)

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M A T E R I A L S A F E T Y D A T A S H E E T

Dow Chemical U.S.A. Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 55352

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PRODUCT NAME: METHYL CHLOROFORM, LOW STABILIZED

Effective Date: 11/20/85 Date Printed: 06/21/86

MSDS:000699

7. FIRST AID: (CONTINUED)

transport to emergency facility immediately.

INHALATION: Remove to fresh air. If not breathing, give mouth-to-mouth resuscitation. If breathing is difficult, give oxygen. Call a physician.

NOTE TO PHYSICIAN: Because rapid absorption may occur through lungs if aspirated and cause systemic effects, the decision of whether to induce vomiting or not should be made by an attending physician. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. Exposure may increase "myocardial irritability". Do not administer sympathomimetic drugs unless absolutely necessary. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

8. HANDLING PRECAUTIONS:

EXPOSURE GUIDELINE(S): 1,1,1-Trichloroethane - OSHA standard is 350 ppm and current ACGIH TLV is 350 ppm (450 ppm STEL).

VENTILATION: Control airborne concentrations below the exposure guideline. Use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations. Lethal concentrations may exist in areas with poor ventilation.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use an approved air-purifying respirator. For emergency and other conditions where the exposure guideline may be greatly exceeded, use an approved positive pressure self-contained breathing apparatus. In confined or poorly ventilated areas, use an approved positive pressure self-contained breathing apparatus.

SKIN PROTECTION: For brief contact, no precautions other than clean body-covering clothing should be needed. When prolonged

(Continued on Page 5)

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M A T E R I A L S A F E T Y D A T A S H E E T

Dow Chemical U.S.A. Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 55352

Page: 5

PRODUCT NAME: METHYL CHLOROFORM, LOW STABILIZED

Effective Date: 11/20/85 Date Printed: 06/21/86 MSDS:000699

8. HANDLING PRECAUTIONS: (CONTINUED)

or frequently repeated contact could occur, use protective clothing impervious to this material. Selection of specific items such as gloves, boots, apron, or full body suit will depend on operation.

EYE PROTECTION: Use safety glasses. Where contact with liquid is likely, chemical goggles are recommended because eye contact with this material may cause pain, even though it is unlikely to cause injury.

9. ADDITIONAL INFORMATION:

SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Handle with reasonable care. Avoid breathing vapors. Store in a cool dry place. Concentrated vapors of methyl chloroform, low stabilized - are heavier than air and will collect in low areas such as pits, degreasers, storage tanks, and other confined areas. Do not enter these areas where vapors of this product are suspected unless special breathing apparatus is used and an observer is present for assistance.

1,1,1-Trichloroethane products should not be packaged in aluminum aerosol cans or with finely divided aluminum or its alloys in an aerosol can.

Aluminum is not an acceptable material of construction for pumps, mixers, fittings, storage tanks for 1,1,1-trichloroethane products or formulations. Metallic aluminum and zinc powders should be avoided.

For additional information on toxicity, handling precautions, and first aid, refer to chlorinated solvents literature form no. 100-5792.

MSDS STATUS: Revised 1, 5, 6, 7, and 9.

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The Information Herein Is Given In Good Faith, But No Warranty, Express Or Implied, Is Made. Consult The Dow Chemical Company For Further Information.



BUSHY RUN RESEARCH CENTER

R. D. 4, Mellon Road, Export, Pennsylvania 15632

Report 50-514
Appendix 5
Page 17

Telephone (412) 733-5200

PROTOCOL AMENDMENT #1

TITLE: Developmental Toxicity Study of Inhaled 1,1,1-Trichloroethane
in New Zealand White Rabbits

BRRC PROJECT NUMBER: 86-95-80604

SPONSOR: Halogenated Solvents Industry Alliance
1612 K Street, NW, Suite 300
Washington, DC 20006

TESTING FACILITY: Bushy Run Research Center (BRRC)
R.D. #4, Mellon Road
Export, PA 15632
Attention: R. W. Tyl
(412) 733-5277

Reviewed and Approved by:

Bushy Run Research Center:

Rochelle W. Tyl 10/22/86
Rochelle W. Tyl, Ph.D., DABT Date
Study Director/Manager
Reproductive and Developmental
Toxicology Section

Linda J. Calisti 10/22/86
Linda J. Calisti, B.S., Date
Group Leader, Good Laboratory
Practices/Quality Assurance

Fred R. Frank 10/25/86
Fred R. Frank, Ph.D. Date
Director

Sponsor:

James A. Barter 10/27/86
James A. Barter, Ph.D., DABT Date

0816P-1

SL 042759

The protocol is amended as follows:

1. Location of Protocol Change: MATERIALS AND METHODS, Quarantine Period (Page 3)

Description of Protocol Change:

From:

"All animals will be housed in BRRC animal rooms 105 (breeding colony males) and 102 (for study females). The animals will be received at least two weeks before the initiation of the mating period. During the quarantine period the animals will be observed regularly for general health status and ability to adapt to the watering system. Body weights will be ascertained at least once prior to the mating period. Female rabbits in good health at least 2.5 kg in weight will be used for this study."

To:

"All animals will be housed in BRRC animal rooms 105 (breeding colony males) and 122 (for study females). The animals will be received at least two weeks before the initiation of the mating period. During the quarantine period the animals will be observed regularly for general health status and ability to adapt to the watering system. Body weights will be ascertained at least once prior to the mating period. Female rabbits in good health at least 2.5 kg in weight will be used for this study."

Rationale: The animal room for the study females was changed prior to their arrival. The rooms have the same environmental controls and the change will not affect the conduct of the study.

2. Location of Protocol Change: MATERIALS AND METHODS, Husbandry (Page 3)

Description of Protocol Change:

From:

"During the quarantine period, rabbits will be housed individually in stainless steel wire-mesh cages mounted in steel racks. After mating, females will be housed one per cage in stainless steel wire-mesh cages mounted in steel racks. Deotized® paperboard (Shepherd Specialty Papers, Inc., Kalamazoo, MI) will be placed under each row of cages to collect solid and liquid excreta. An automatic watering system with demand control valves mounted on each rack will provide water for the rabbits. Water and food will be available ad libitum at all times except

during exposures. The light cycle in these rooms will be 12 hours light/12 hours dark. Specific information on the cages (dimensions, etc.) will be included in the study data. The study females will be housed in Room 102 for acclimation, breeding, prior to, between and after the exposures until scheduled sacrifice on gd 29."

To:

"During the quarantine period, rabbits will be housed individually in stainless steel wire-mesh cages mounted in steel racks. After mating, females will be housed one per cage in stainless steel wire-mesh cages mounted in steel racks. Deotized® paperboard (Shepherd Specialty Papers, Inc., Kalamazoo, MI) will be placed under each row of cages to collect solid and liquid excreta. An automatic watering system with demand control valves mounted on each rack will provide water for the rabbits. Water and food will be available ad libitum at all times except during exposures. For exposures, mated females will be transferred, one per cage, into stainless steel wire-mesh cages and moved into the appropriate chambers in room 139. Stainless steel shelf pans will be placed under each row of cages to prevent urinary and fecal contamination of animals at lower levels. After exposure, the animals will be returned to their original cages and "home" room. The light cycle in these rooms will be 12 hours light/12 hours dark. Specific information on the cages (dimensions, etc.) will be included in the study data. The study females will be housed in Room 102 for acclimation, breeding, prior to, between and after the exposures until scheduled sacrifice on gd 29."

Rationale: The procedure for transferring females to exposure cages for the exposure period was added for completeness.

3. Location of Protocol Change: INHALATION CHAMBER OPERATION, Exposure Groups (Page 5)

Description of Protocol Change:

From:

"The target concentrations for the three 1,1,1-trichloroethane-exposed groups will be added to the protocol by amendment based on the results of the exposure range-finding study. The negative control group (animals handled the same as the 1,1,1-trichloroethane-exposed animals) will be exposed to ambient air only (0 ppm)."

To:

"The target concentrations for the three 1,1,1-trichloroethane-exposed groups will be 1000, 3000 and 6000 ppm. The negative control group (animals handled the same as the 1,1,1-trichloroethane-exposed animals) will be exposed to ambient air only (0 ppm)."

Rationale: The three target exposure concentrations were selected by the Sponsor (with concurrence of the Study Director) after examination of the draft results from the exposure range-finding study on September 17, 1986 via conference call with Dr. J. A. Barter, Dr. K. S. Rao, Dr. J. P. Lyon, and Dr. R. W. Tyl. The Study Director was notified by the Sponsor on September 29, 1986 that the U.S. EPA had given verbal agreement to these selected target exposure concentrations.

PATH/esk/0816P-1
10-22-86



BUSHY RUN RESEARCH CENTER

R. D. 4, Mellon Road, Export, Pennsylvania 15632

Telephone (412) 733-5200

PROTOCOL

TITLE: Developmental Toxicity Exposure Range-Finding Study of Inhaled
1,1,1-Trichloroethane in New Zealand White Rabbits

BRRC PROJECT NUMBER: 86-95-80603

SPONSOR: Halogenated Solvents Industry Alliance
1612 K Street, NW, Suite 300
Washington, DC 20006

TESTING FACILITY: Bushy Run Research Center (BRRC)
R.D. #4, Mellon Road
Export, PA 15632
Attention: R. W. Tyl
(412) 733-5277

Reviewed and Approved by:

Bushy Run Research Center:

Rochelle W. Tyl 7/17/86
Rochelle W. Tyl, Ph.D., DABT Date
Study Director/Manager
Reproductive and Developmental
Toxicology Section

Linda J. Calisti 7/18/86
Linda J. Calisti, B.S., Date
Group Leader, Good Laboratory
Practices/Quality Assurance

F. R. Frank 7/22/86
Fred R. Frank, Ph.D. Date
Director

Sponsor:

James A. Barter 7/24/86
James A. Barter, Ph.D., DABT Date

0618P-3

SL 042763

Developmental Toxicity Exposure Range-Finding Study of Inhaled
1,1,1-Trichloroethane in New Zealand White Rabbits

PURPOSE

The purpose of this study is to establish the exposure-response range of the test article for maternal and/or embryonic toxicity in pregnant New Zealand white rabbits in order to select appropriate exposure concentrations for use in the definitive developmental toxicity study.

MATERIALS AND METHODS

Test Article

Liquid 1,1,1-trichloroethane (methylchloroform; TCEA; CAS No. 71-55-6) stabilized with less than 0.1% butylene oxide (1,2-epoxybutane; CAS No. 106-88-7) will be used. The test chemical, supplied by Dow Chemical USA, Texas Operations, Freeport, TX, arrived at BRRRC on June 25, 1986 in three 55-gallon sealed drums bearing the Lot No. TA8606182. It received the BRRRC No. 49-228 A, B, and C. Pertinent chemical and physical properties of the test chemical are presented in Attachment 1.

Purity and Stability

A compositional analysis of the liquid 1,1,1-trichloroethane to be used for this study will be performed by the Sponsor prior to the exposure period. A sample will be sent to the Sponsor at the end of the exposure period for compositional analysis to affirm stability.

Handling Precautions

Precautions will be undertaken to avoid contact of the test material to the clothing, skin or eyes. Plastic or rubber gloves and safety glasses will always be used in handling this compound.

Cleaning Contaminated Equipment: Equipment contaminated with the test chemical will be cleaned with acetone.

Storage Conditions: The test material will be kept in a chemical storage area. Samples used for the study will be stored in one-gallon glass bottles blanketed with nitrogen and kept in an exhaust hood. A reserve sample will be taken and kept at BRRRC.

Animals

Forty (40) virgin female New Zealand white rabbits (2.5 - 3.5 kg, approximately 5 1/2 months old) will be ordered from Hazelton Dutchland Laboratories, Inc. (Denver, PA). Male New Zealand white rabbits from the BRRRC breeding colony will be used for breeding. The New Zealand white rabbit (a lagamorph) has been selected due to its consistent high fecundity in various

laboratories and known incidence of spontaneous malformations (Woo and Hoar, 1982; Stadler, et al., 1983). In addition, the gestational stages and morphogenic process of this species, as well as its sensitivity to known teratogens have been described extensively in the literature (Nishimura and Shiota, 1977; Hartman, 1974; Desesso and Jordan, 1977; McClain and Langhoff, 1980; Palmer, 1978). A data base for historical controls is available for this rabbit strain in this laboratory with regard to reproductive indices and incidence of fetal malformations and variations.

Quarantine Period

All animals will be housed in BRRC animal rooms 102 (females) and 105 (for male rabbit colony). The animals will be received at least two weeks before the initiation of the mating period. During the quarantine period the animals will be observed regularly for general health status and ability to adapt to the watering system. Body weights will be ascertained at least once prior to the mating period. Female rabbits in good health at least 2.5 kg in weight will be used for this study.

Quality Control

Quality control will be performed upon the receipt of the animals. Rabbits will be examined by a veterinarian and rabbit fecal samples will be analyzed for intestinal parasites. The quality control evaluation of these animals will be used to determine their health status.

Husbandry

During the quarantine period, rabbits will be housed individually in stainless steel wire-mesh cages mounted in steel racks. After mating, females will be housed one per cage in stainless steel wire-mesh cages mounted in steel racks. Deotized® paperboard (Shepherd Specialty Papers, Inc., Kalamazoo, MI) will be placed under each row of cages to collect solid and liquid excreta. An automatic watering system with demand control valves mounted on each rack will provide water for the rabbits. Water and food will be available ad libitum at all times except during exposures. All study females will remain in Room 102 during quarantine, mating, prior to, between, and after exposures until scheduled sacrifice on gd 19. The light cycle in this room will be 12 hours light/12 hours dark. Specific information on the cages (dimensions, etc.) will be included in the study data.

Animal Identification

Each rabbit will be assigned a unique number and will be identified with a Monel® metal ear tag (Gey Band and Tag Co., Morristown, PA).

Temperature and Relative Humidity

Temperature and relative humidity will be recorded continuously for each animal holding room. Room temperature will be maintained at $19 \pm 3^{\circ}\text{C}$, and relative humidity will be maintained between 40% and 60%.

Food and Water

The water available to the animals will be tap water (Municipal Authority of Westmoreland County, Greensburg, PA). The incoming water was analyzed for contaminants by the NUS Corporation (Pittsburgh, PA). The water quality analyses performed per EPA specifications included the 129 "priority" pollutants, which were identified in the Federal Register, Vol. 45, No. 98 Appendix D, Part 122. The food available to the rabbits will be Prolab Certified Rabbit Food® (Agway Inc., St. Marys, OH). The analyses of the food for possible contaminants (including nitrosamine) will be performed by the supplier. Results of water and food analyses will be reviewed by the Study Director.

INHALATION CHAMBER OPERATION

Chambers

Four, approximately 4300-liter stainless steel chambers with glass doors and windows for animal observation will be employed, located in Room 139. Air sampling probes will be positioned in the areas of animal placement.

Airflow

Chambers will be provided with filtered air at a flow rate of approximately 750-1000 liters/min (approximately 12-14 air changes per hour). All chambers will be maintained at a slight negative pressure to prevent any vapor from entering the room.

Chamber Temperature and Relative Humidity

Temperature and relative humidity will be recorded at least once every 30 minutes during each exposure using a maximum-minimum thermometer (Abbeon Cal., Inc., Sant Barbara, CA) and an Airguide Humidity Indicator (Airguide Instrument Co., Chicago, IL), respectively.

Cage Position and Rotation During Exposure

In case of undetected differences in environment or 1,1,1-trichloroethane concentration within the chamber, all exposure cage positions will be rotated daily. A description of the rotation will be provided in the raw data.

Vapor Generation

The liquid test article will be metered from a piston or pump (Fluid Metering Inc., Oyster Bay, NY) into a heated glass evaporator similar in design as described by Carpenter et al. (1975). Temperatures in the evaporator will be maintained at the lowest level sufficient to vaporize the liquid. The resultant vapor will be carried into the chambers by a counter current air stream which enters the bottom of the evaporator.

Analysis of Chamber Atmosphere

Chamber concentrations will be determined approximately once each hour by a gas chromatographic technique. The chamber sample probes will be placed in the breathing zone of the animals. The daily nominal (estimated) chamber concentrations will also be reported.

Mating

New Zealand white rabbit females (at least 2.5 kg and 5 1/2-6 months old) will be mated to "proven", fertile males from the BRRC breeding colony. Following copulation, the animals will be returned to their respective cages and the date of the copulation will be designated gd 0 (Hafez, 1970). Records will be maintained on the identification numbers of each male used and any relevant comments regarding the mating of each female. Mated female rabbits will be housed individually.

Successfully mated females will be randomly assigned to one of three 1,1,1-trichloroethane exposure groups or a control group by a stratified randomization procedure by body weight on gd 0. Each treatment group will consist of eight mated female rabbits.

Exposure Groups

The target concentrations for the three 1,1,1-trichloroethane-exposed groups will be 1000, 3000 and 6000 ppm. The negative control group (animals handled the same as the 1,1,1-trichloroethane-exposed animals) will be exposed to ambient air only (0 ppm).

Length of Exposures

Rabbits will be exposed on gd 6 through 18 (13 consecutive days) for 6 hours/day.

Maternal Weights

Maternal weights will be recorded on gd 0, 6, 9, 12, 15 and 19. All weights taken during the treatment period will be obtained prior to daily exposure.

Maternal Observations

All animals will be observed daily throughout the study (mating to necropsy) for clinical signs of toxicity.

Maternal Sacrifice and Laparotomy

Rabbits will be sacrificed on the day following the last exposure on gd 19. Rabbits will be euthanized by intravenous injection of T-61 euthanasia solution (Hoechst Corp., Somerville, NJ) into the marginal ear vein. Immediately after euthanization, the eyes will be examined in situ by gently

pressing a glass slide against the cornea and examining the eye under fluorescent light illumination. The complete necropsy examination, external and internal, will be performed by a veterinary pathologist. The maternal body cavities will be opened by a midline thoracolaparotomy. The gravid uteri, ovaries (including corpora lutea), cervixes, vagina, and peritoneal and thoracic cavities of each pregnant animal will be examined grossly. j Ovarian corpora lutea of pregnancy will be counted, and maternal liver weight will be determined. Sections of maternal liver, along with other tissues deemed appropriate by the study pathologist at the time of necropsy, will be preserved in buffered neutral 10% formalin but will not be examined histologically unless deemed necessary to interpret other observations from this study. The gravid uteri will be immediately ligated at their cervical end to prevent the expulsion of concepti by myometrial peristalsis. The ligated uteri with ovaries and oviducts attached will be externally examined for signs of hemorrhage and then removed from the peritoneal cavity, weighed, and dissected longitudinally to expose the contents. All live and dead fetuses and resorption sites will be recorded. Uteri from females that appear nongravid will be placed in a 10% ammonium sulfide solution for confirmation of pregnancy status (Salewski, 1964).

Dead or Moribund Animals

A gross necropsy will be performed on all animals not surviving to the scheduled sacrifice in an attempt to determine the cause of death. Pregnancy status will be determined, if possible, by examination of uterine contents or by staining apparent nongravid uteri with 10% ammonium sulfide. Maternal tissues will be preserved for microscopic examination in neutral buffered 10% formalin only as deemed necessary by the gross findings.

Culled Animals

Animals not used in the study will be euthanized or used for methods development and training of the BRRC staff.

Guidelines for Exposure Concentrations

Based on the results of this study, three exposure levels of the test substance will be determined for the definitive developmental toxicity study. The "high" concentration should cause "minimal" adult animal toxicity (e.g. loss of body weight, change in relative organ weight, etc.) without exceeding a mortality rate of 10%. The low exposure level will be determined which will cause no observable adult animal toxicity. The intermediate exposure level will provide information on any embryo/fetal toxicity (including teratogenicity). The Study Director will make recommendations to the Sponsor as to exposure levels for the full teratogenicity study, but the final decision as to exposure levels will rest with the Sponsor.

Statistical Analysis

The unit of comparison will be the pregnant doe or the litter (Weil, 1970). Results of the quantitative continuous variables (e.g. maternal body weights, liver weights, etc.) will be intercompared for the three treatment

groups and one control group by use of Levene's test for equal variances (Levene, 1960), analysis of variance (ANOVA), and t-tests with Bonferroni probabilities. The t-tests will be used when the F value from the ANOVA is significant. When Levene's test indicates homogeneous variances and the ANOVA is significant, the pooled t-test will be used for pairwise comparisons. When Levene's test indicates heterogeneous variances, all groups will be compared by an ANOVA for unequal variances (Brown and Forsythe, 1974) followed, when necessary, by the separate variance t-test.

Nonparametric data obtained following laparohysterectomy will be statistically evaluated using the Kruskal-Wallis test (Sokal and Rohlf, 1969) followed by the Mann-Whitney U test for pairwise comparisons (Sokal and Rohlf, 1969) when appropriate. Frequency data will be compared using the Fisher's Exact Test (Sokal and Rohlf, 1969). For all statistical tests, the fiducial limit of 0.05 (two-tailed) will be used as the critical level of significance.

Personnel Health and Safety

Normal safety precautions will be employed in the handling of the test article. The Sponsor will advise BRRC of any additional precautions that should be taken.

Protocol Alterations

Alterations of this protocol may be made as the study progresses. No major changes in the protocol will be made without the specific written request or consent of the sponsor. In the event that the Sponsor authorizes a protocol change verbally, such change will be made by BRRC. However, it then becomes the responsibility of the Sponsor to follow such verbal change with a written verification. All protocol modifications will be issued as amendments and will be signed by the Study Director and Sponsor.

Scheduling

Animals arrive at BRRC: July 29, 1986
Acclimatization period begins: July 29, 1986
Mating period begins: August 16, 1986 (first gd 0 also August 16, 1986)
Treatment period begins: August 22, 1986
Sacrifice period begins (gd 19): September 4, 1986
Submission of draft data to sponsor: The data in draft form will be submitted to the Sponsor within two (2) weeks after the last sacrifice day for selection of the appropriate exposure concentrations for the definitive development toxicity study. A complete report of this study will be included as an appendix in the Final Report.

Records and Data Retention

All records pertaining to this study will be permanently retained and placed in the BRRC Archives upon completion of the report. All data, including reports from this study, will be retained for at least ten (10) years after completion of the study in the BRRC Archives and will be made available for inspection upon request by authorized personnel of the sponsor. An appropriate sample of the test article will be retained for ten (10) years following completion of the study.

Good Laboratory Practice Compliance

The Bushy Run Research Center through the administration of a quality assurance program by the Good Laboratory Practices Committee and Quality Assurance Unit, assures compliance of all phases of toxicological studies with existing regulations and generally accepted good laboratory practices according to EPA (TSCA), 1983.

Study Personnel

Study Director/Manager,

Teratology Section:

Attending Veterinary Pathologist:

Pathologist:

Teratology Personnel:

R. W. Tyl, Ph.D., DABT

P. E. Losco, VMD, Diplomate ACVP

E. H. Fowler, DVM, Ph.D., Diplomate ACVP

D. L. Fait, AALAS Cert. II

K. A. France, B.A.

L. C. Fisher, B.S.

M. F. Kubena, B.S.

T. A. Rebick, A.H.T., A.S., AALAS Cert. I

D. J. McNeil, A.H.T., A.S., AALAS Cert. I.

T. A. Savine, HT(ASCP)

Inhalation Personnel:

D. E. Dodd, Ph.D., DABT, Manager

I. M. Pritts, Ph.D.

D. R. Klonne, Ph.D.

W. J. Kintigh, B.S., AALAS Cert. I

Quality Assurance Personnel:

L. J. Calisti, B.S., AALAS Cert. III, Group Leader

J. R. Bernard, B.S.

W. J. Conroy, B.S.

Animal Care Personnel:

M. J. Cardella, AALAS Cert. III, Supervisor

In addition, other BRRC personnel may participate in this study.

Report

A draft summary of the results will be prepared upon the completion of the study and provided to the sponsor. Summary tables will be prepared including:

chamber analytical data
distribution and fate of all animals on study
maternal clinical signs
maternal body weights and weight changes
maternal liver weight (absolute and relative)
maternal gravid uterine weight
ovarian corpora lutea of pregnancy
status of uterine implantation sites (early, late
resorptions, dead fetuses, live fetuses)

These data will be used to determine the exposure concentrations for use in the definitive developmental toxicity evaluation of 1,1,1-trichloroethane. A complete description of materials and methods, results (including tables) and conclusions of this exposure range-finding study will be included as an appendix in the Final Report of the definitive developmental toxicity study.

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WPC/esk/0618P-1
07-01-86

M A T E R I A L S A F E T Y D A T A S H E E T

Dow Chemical U.S.A. Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 55352

Page: 1

PRODUCT NAME: METHYL CHLOROFORM, LOW STABILIZED

Effective Date: 11/20/85 Date Printed: 06/21/86

MSDS:000699

1. INGREDIENTS:

1,1,1-Trichloroethane

CAS# 000071-55-6

99.9%

2. PHYSICAL DATA:

BOILING POINT: 165F (74C)

VAP PRESS: 100 mmHg @ 20C

VAP DENSITY: 4.55

SOL. IN WATER: 0.07 g/100 g @ 25C

SP. GRAVITY: 1.330-1.335 @ 25/25C

APPEARANCE: Colorless liquid.

ODOR: Irritating odor at high concentrations.

3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: None

METHOD USED: TOC, TCC, COC

FLAMMABLE LIMITS

LFL: 7.5% @ 25C

UFL: 15% @ 25C

EXTINGUISHING MEDIA: Water fog.

FIRE & EXPLOSION HAZARDS: Not available.

FIRE-FIGHTING EQUIPMENT: Positive-pressure, self-contained
respiratory equipment.

(Continued on Page 2)

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SL 042773

M A T E R I A L S A F E T Y D A T A S H E E T

Dow Chemical U.S.A. Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 55352

Page: 2

PRODUCT NAME: METHYL CHLOROFORM, LOW STABILIZED

Effective Date: 11/20/85 - Date Printed: 06/21/86.

MSDS:000699

4. REACTIVITY DATA:

STABILITY: (CONDITIONS TO AVOID) Autoignition temperature 998F (537C). Avoid open flames, welding arcs, or other high temperature sources which induce thermal decomposition.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Water - slow hydrolysis produces corrosive acid. Avoid contact with or storage in aluminum and its alloys. Definitely avoid contact with metallic aluminum and zinc powders.

HAZARDOUS DECOMPOSITION PRODUCTS: Hydrogen chloride and very small amounts of phosgene and chlorine.

HAZARDOUS POLYMERIZATION: Will not occur.

5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

ACTION TO TAKE FOR SPILLS/LEAKS: Small leaks: Mop up, wipe up, or soak up immediately. Remove to out-of-doors. Large spills: Evacuate area. Contain liquid; transfer to closed metal containers. Keep out of water supply.

DISPOSAL METHOD: When disposing of the unused contents, the preferred options are to send to licensed reclaimer, permitted incinerators, or to evaporate very small quantities in compliance with local, state, and federal regulations including Subtitle C of the Resource Conservation and Recovery Act. Dumping into sewers, on the ground, or into any body of water is strongly discouraged, and may be illegal. Consult The Dow Chemical Company for further information.

6. HEALTH HAZARD DATA:

EYE: May cause pain. May cause slight transient (temporary) irritation with slight transient corneal injury. Vapors may irritate eyes.

SKIN CONTACT: Prolonged or repeated exposure may cause skin irritation. Repeated contact may cause drying or flaking of

(Continued on Page 3)

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M A T E R I A L S A F E T Y D A T A S H E E T

Dow Chemical U.S.A. Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 55352

Page: 3

PRODUCT NAME: METHYL CHLOROFORM, LOW STABILIZED

Effective Date: 11/20/85 Date Printed: 06/21/86

MSDS:000699

6. HEALTH HAZARD DATA: (CONTINUED)

skin.

SKIN ABSORPTION: A single prolonged skin exposure is not likely to result in absorption of harmful amounts. The LD50 for rabbits is about 15,000 mg/kg.

INGESTION: Single dose oral toxicity is low. The LD50 for rats is >10,000 mg/kg. If aspirated (liquid enters the lung), may be rapidly absorbed through the lungs and result in injury to other body systems.

INHALATION: Minimal anesthetic or narcotic effects may be seen in the range of 500-1000 ppm trichloroethane. Progressively higher levels over 1000 ppm may cause dizziness, drunkenness; concentrations as low as 10,000 ppm can cause unconsciousness and death. In confined or poorly ventilated areas, vapors which readily accumulate can cause unconsciousness and death. These high levels may also cause cardiac arrhythmias (irregular heartbeats).

SYSTEMIC & OTHER EFFECTS: Based on available data, repeated exposures are not anticipated to cause any significant adverse effects. 1,1,1-Trichloroethane and similar mixtures did not cause cancer in long-term animal studies. Birth defects are unlikely. Exposures having no adverse effects on the mother should have no effect on the fetus. In animal studies, has been shown not to interfere with reproduction. Results of in vitro ('test tube') mutagenicity tests on 1,1,1-trichloroethane have been negative. Results of mutagenicity tests in animals have been negative.

7. FIRST AID:

EYES: Irrigate immediately with water for at least 5 minutes.

SKIN: Wash off in flowing water or shower. Remove contaminated clothing and wash before reuse.

INGESTION: Do not induce vomiting. Call a physician and/or

(Continued on Page 4)

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M A T E R I A L S A F E T Y D A T A S H E E T

Dow Chemical U.S.A. Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 55352

Page: 4

PRODUCT NAME: METHYL CHLOROFORM, LOW STABILIZED

Effective Date: 11/20/85 Date Printed: 06/21/86

MSDS:000699

7. FIRST AID: (CONTINUED)

transport to emergency facility immediately.

INHALATION: Remove to fresh air. If not breathing, give mouth-to-mouth resuscitation. If breathing is difficult, give oxygen. Call a physician.

NOTE TO PHYSICIAN: Because rapid absorption may occur through lungs if aspirated and cause systemic effects, the decision of whether to induce vomiting or not should be made by an attending physician. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. Exposure may increase "myocardial irritability". Do not administer sympathomimetic drugs unless absolutely necessary. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

8. HANDLING PRECAUTIONS:

EXPOSURE GUIDELINE(S): 1,1,1-Trichloroethane - OSHA standard is 350 ppm and current ACGIH TLV is 350 ppm (450 ppm STEL).

VENTILATION: Control airborne concentrations below the exposure guideline. Use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations. Lethal concentrations may exist in areas with poor ventilation.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use an approved air-purifying respirator. For emergency and other conditions where the exposure guideline may be greatly exceeded, use an approved positive pressure self-contained breathing apparatus. In confined or poorly ventilated areas, use an approved positive pressure self-contained breathing apparatus.

SKIN PROTECTION: For brief contact, no precautions other than clean body-covering clothing should be needed. When prolonged

(Continued on Page 5)

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M A T E R I A L S A F E T Y D A T A S H E E T

Dow Chemical U.S.A. Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 55352 *Page: 5

PRODUCT NAME: METHYL CHLOROFORM, LOW STABILIZED

Effective Date: 11/20/85 Date Printed: 06/21/86 MSDS:000699

8. HANDLING PRECAUTIONS: (CONTINUED)

or frequently repeated contact could occur, use protective clothing impervious to this material. Selection of specific items such as gloves, boots, apron, or full body suit will depend on operation.

EYE PROTECTION: Use safety glasses. Where contact with liquid is likely, chemical goggles are recommended because eye contact with this material may cause pain, even though it is unlikely to cause injury.

9. ADDITIONAL INFORMATION:

SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Handle with reasonable care. Avoid breathing vapors. Store in a cool dry place. Concentrated vapors of methyl chloroform, low stabilized - are heavier than air and will collect in low areas such as pits, degreasers, storage tanks, and other confined areas. Do not enter these areas where vapors of this product are suspected unless special breathing apparatus is used and an observer is present for assistance.

1,1,1-Trichloroethane products should not be packaged in aluminum aerosol cans or with finely divided aluminum or its alloys in an aerosol can.

Aluminum is not an acceptable material of construction for pumps, mixers, fittings, storage tanks for 1,1,1-trichloroethane products or formulations. Metallic aluminum and zinc powders should be avoided. For additional information on toxicity, handling precautions, and first aid, refer to chlorinated solvents literature form no. 100-5792.

MSDS STATUS: Revised 1, 5, 6, 7, and 9.

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Express Or Implied, Is Made. Consult The Dow Chemical Company
For Further Information.



BUSHY RUN RESEARCH CENTER

R. D. 4, Mellon Road, Export, Pennsylvania 15632

Telephone (412) 733-5200

PROTOCOL AMENDMENT #1

TITLE: Developmental Toxicity Exposure Range-Finding Study of Inhaled
1,1,1-Trichloroethane in New Zealand White Rabbits

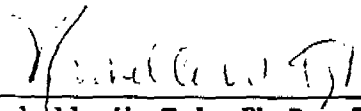
BRRC PROJECT NUMBER: 86-95-80603

SPONSOR: Halogenated Solvents Industry Alliance
1612 K Street, NW, Suite 300
Washington, DC 20006

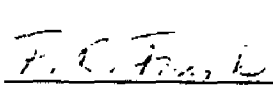
TESTING FACILITY: Bushy Run Research Center (BRRC)
R.D. #4, Mellon Road
Export, PA 15632
Attention: R. W. Tyl
(412) 733-5277

Reviewed and Approved by:

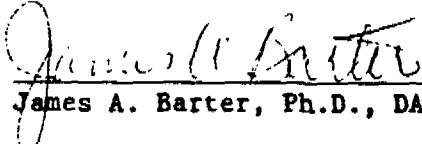
Bushy Run Research Center:


Rochelle W. Tyl, Ph.D., DABT
Study Director/Manager
Reproductive and Developmental
Toxicology Section
9/16/86
Date


Linda J. Calisti, B.S.,
Group Leader, Good Laboratory
Practices/Quality Assurance
9/16/86
Date


Fred R. Frank, Ph.D.
Director
9/16/86
Date

Sponsor:


James A. Barter, Ph.D., DABT
9/19/86
Date

0759P-1

The protocol is amended as follows:

1. Location of Protocol Change: MATERIALS AND METHODS, Quarantine Period (Page 3)

Description of Protocol Change:

From:

All animals will be housed in BRRC animal rooms 102 (females) and 105 (for male rabbit colony). The animals will be received at least two weeks before the initiation of the mating period. During the quarantine period the animals will be observed regularly for general health status and ability to adapt to the watering system. Body weights will be ascertained at least once prior to the mating period. Female rabbits in good health at least 2.5 kg in weight will be used for this study."

To:

All animals will be housed in BRRC animal rooms 107 (females) and 105 (for male rabbit colony). The animals will be received at least two weeks before the initiation of the mating period. During the quarantine period the animals will be observed regularly for general health status and ability to adapt to the watering system. Body weights will be ascertained at least once prior to the mating period. Female rabbits in good health at least 2.5 kg in weight will be used for this study."

Rationale for Change: The animal room was changed from 102 to 107 for the females prior to their arrival. The rooms are essentially identical with all of the same environmental conditions and controls. This change will not impact on the conduct of the study.

2. Location of Protocol Change: MATERIALS AND METHODS, Husbandry (Page 3)

Description of Protocol Change:

From:

"During the quarantine period, rabbits will be housed individually in stainless steel wire-mesh cages mounted in steel racks. After mating, females will be housed one per cage in stainless steel wire-mesh cages mounted in steel racks. Deotized® paperboard (Shepherd Specialty Papers, Inc., Kalamazoo, MI) will be placed under each row of cages to collect solid and liquid excreta. An automatic watering system with demand control valves mounted on each rack will provide water for the rabbits. Water and food will be available ad libitum at all times except during exposures. All study females will remain in Room 102 during quarantine, mating, prior to, between, and after exposures until scheduled sacrifice on gd 19. The light cycle in this room will be 12 hours light/12 hours dark. Specific information on the cages (dimensions, etc.) will be included in the study data."

To:

"During the quarantine period, rabbits will be housed individually in stainless steel wire-mesh cages mounted in steel racks. After mating, females will be housed one per cage in stainless steel wire-mesh cages mounted in steel racks. Deotized® paperboard (Shepherd Specialty Papers, Inc., Kalamazoo, MI) will be placed under each row of cages to collect solid and liquid excreta. An automatic watering system with demand control valves mounted on each rack will provide water for the rabbits. Water and food will be available ad libitum at all times except during exposures. All study females will remain in Room 107 during quarantine, mating, prior to, between, and after exposures until scheduled sacrifice on gd 19. The light cycle in this room will be 12 hours light/12 hours dark. Specific information on the cages (dimensions, etc.) will be included in the study data."

Rationale for Change: The animal room was changed from 102 to 107 for the females prior to their arrival. The rooms are essentially identical with all of the same environmental conditions and controls. This change will not impact on the conduct of the study.

3. Location of Protocol Change: INHALATION CHAMBER OPERATION, Scheduling
(Page 7)

Description of Protocol Change:

From:

"Animals arrive at BRRRC: July 29, 1986
Acclimatization period begins: July 29, 1986
Mating period begins: August 16, 1986 (first gd 0 also August 16, 1986)
Treatment period begins: August 22, 1986
Sacrifice period begins (gd 19): September 4, 1986
Submission of draft data to sponsor: The data in draft form will be submitted to the Sponsor within two (2) weeks after the last sacrifice day for selection of the appropriate exposure concentrations for the definitive development toxicity study. A complete report of this study will be included as an appendix in the Final Report."

To:

"Animals arrive at BRRRC: July 30, 1986
Acclimatization period begins: July 30, 1986
Mating period begins: August 16, 1986 (first gd 0 also August 16, 1986)
Treatment period begins: August 22, 1986
Sacrifice period begins (gd 19): September 4, 1986
Submission of draft data to sponsor: The data in draft form will be submitted to the Sponsor within two (2) weeks after the last sacrifice day for selection of the appropriate exposure concentrations for the definitive development toxicity study. A complete report of this study will be included as an appendix in the Final Report."

Rationale for Change: The arrival date of the animals was delayed one day from July 29 to July 30, 1986, at the request of the supplier. This change still allows for at least two weeks of acclimatization and will not impact on the conduct of the study.

WPC/esk/0759P-1
09-16-86

SL 042781

APPENDIX 6

Developmental Toxicity Exposure Range-Finding Study of
Inhaled 1,1,1-Trichloroethane in New Zealand White Rabbits

(11 Pages)

SL 042782

APPENDIX 6

Developmental Toxicity Exposure Range-Finding Study of 1,1,1-Trichloroethane in New Zealand White Rabbits

OBJECTIVE

The objective of this study was to establish the exposure-response range of the test article for maternal and/or embryonic toxicity in pregnant New Zealand white rabbits in order to select appropriate exposure concentrations for use in the definitive developmental toxicity study.

MATERIALS AND METHODS

The test chemical, lot number and BRRC Sample Number were the same as in the definitive study. Forty (40) virgin female New Zealand white (NZW) rabbits (birthdate February, 1986) were received from the same supplier as that used in the definitive study on July 30, 1986, and were housed in animal room 102 upon arrival and moved to room 107 on the following day for the remainder of the study. Certified feed from the same supplier (Batch No. 6134 SMI) and water were available ad libitum except during exposures. Females were singly housed throughout the study. Quarantine, mating, exposures, and observational procedures were the same as those employed in the definitive study. Natural mating occurred on August 16 and 17, 1986; gestational day (gd) 0 was also August 16 and 17, 1987. Eight (8) mated females were assigned to each treatment group by stratified randomization procedures by body weight on gd 0. Exposures were for six hours per day, for 13 consecutive days, gd 6 through 18, August 22 through September 4, 1986. Exposure concentrations were 0, 1000, 3000 and 6000 ppm. Inhalation procedures including exposure of animals and generation and analysis of test atmospheres were the same as those employed in the definitive study. Exposures took place in the chambers in room 139. Animals were observed daily for clinical signs of toxicity and weighed on gd 0, 6, 9, 12, 15 and 19. On gd 19 (the day following the last exposure), all study females were sacrificed by intravenous injection of T-61 euthanasia solution, on September 4 and 5, 1986. Maternal eyes were immediately examined in situ by gently pressing a glass slide against the cornea and examining the eye under fluorescent light illumination. A complete necropsy examination was performed on each animal by Dr. E. H. Fowler, DVM, Ph.D., Veterinary Pathologist. Ovarian corpora lutea of pregnancy were counted, the gravid uterus and maternal liver were weighed and sections of the liver fixed for possible subsequent histopathology. The gravid uterus was examined for implantation sites, resorptions (early and late) and live and dead fetuses. Apparent nonpregnant uteri were stained with 10% ammonium sulfide for confirmation of pregnancy status. The protocol and amendment describing the design and conduct of this study are presented in Appendix 5.

RESULTS

Analytical exposure concentrations were 98.4-101.1% of target concentrations; analytical to nominal concentration ratios were 0.90-0.99 indicating no degeneration or adsorption to chamber walls. Temperature and relative humidity in the chambers was maintained at 20.3-24.5°C and 38.5-49.6%, respectively (Table 1). Details of chamber and exposure parameters are presented in Appendix 1C and 1D.

No females died, aborted, were removed from study or delivered early. Pregnancy rate was high and equivalent across all groups. One doe at 6000 ppm resorbed her entire litter (Table 2).

Maternal body weights (Table 3) were depressed in a concentration-related pattern (predominantly at 6000 ppm) on gd 9, 12, 15 and 19, although no pairwise comparisons were statistically significantly different. Maternal body weight gain was depressed with increasing concentrations for gd 6-19 (treatment period), 9-12, 12-15, 15-19 and 0-19 (gestation period), notably at 3000 and 6000 ppm, although no pairwise comparisons were statistically significantly different (Table 3).

Clinical signs of toxicity, including ocular discharge, loose feces and red material on paper board, were observed in three different does at 6000 ppm (Table 4). There were no maternal eye lesions observed at necropsy. No maternal observations at necropsy (Table 5) appeared treatment related except possibly the fully resorbed litter at 6000 ppm (Table 5).

Maternal body and organ weight parameters at necropsy (Table 6) exhibited clear concentration-related changes: absolute body weight, body weight corrected for gravid uterine weight, and gestational body weight change (corrected for initial body weight and weight of the gravid uterus), all exhibited concentration-related decrements, although no pairwise comparisons were statistically significantly different. Absolute and relative liver weight appeared reduced for all chemical-exposed groups. The value at 1000 ppm (but not at 3000 or 6000 ppm) was significantly reduced relative to that of controls.

Gestational parameters are presented in Table 7. Ovarian corpora lutea and uterine implantation sites were slightly (but not statistically significantly) reduced at 3000 and 6000 ppm. There were no effects of treatment on preimplantation loss or on non-viable implants per litter; there was a significant reduction in non-viable implants at 1000 and 3000 ppm and a significant increase in percent live fetuses per litter at 1000 ppm. There were no dead fetuses in this study. At 6000 ppm, the percent live fetuses per litter was reduced (but not significantly), due, at least in large part, to one doe with a fully resorbed litter.

CONCLUSIONS

Based on the results of this exposure range-finding study the Sponsor selected target exposure concentrations for the definitive study, with concurrence of the Study Director on September 17, 1986. The exposure concentrations selected were 0, 1000, 3000 and 6000 ppm (the same as in the range-finding study) with the following rationale. At 6000 ppm in the range-finding study, there was evidence of maternal toxicity: reduced body weights and weight gain, clinical signs of toxicity, and reduced corrected body weight at sacrifice (separate and distinct from contributions of the gravid uterus). There was also possible developmental toxicity (reduced percent live fetuses per litter). These changes were not statistically significantly different from controls, but this may be due to the small size of each group (seven-eight does). For the definitive study with 24 females per group, these effects will probably attain statistical significance. At 3000 ppm, the same evidence of maternal toxicity was observed, with the likelihood that this exposure concentration will also produce effects in the definitive study. The 1000 ppm exposure concentration should be a "no observable effect level" (NOEL) for both maternal and developmental toxicity.

PATH/esk/0949P-2

03-24-87

SL 042785

Table 1

Exposure Parameters: Exposure Range-Finding Study

Target concentration, ppm	0	1000	3000	6000
Analytical concentration, ppm ^a	< MDL ^d	1011 ± 17.8	3019 ± 161.4	5907 ± 126.1
A/T Ratio ^b	-	1.011	1.006	0.984
Nominal concentration, ppm ^a	-	1109 ± 11.4	3049 ± 117.0	6538 ± 36.1
A/N Ratio ^{a,c}	-	0.91 ± 0.015	0.99 ± 0.023	0.90 ± 0.019
Temperature, °C ^a	20.3 ± 1.14	20.7 ± 0.43	21.3 ± 0.55	24.5 ± 0.97
Relative humidity, % ^a	49.6 ± 2.99	48.5 ± 2.43	48.8 ± 3.01	38.5 ± 2.49

^a Grand mean of 14 daily means ± standard deviation

^b Analytical to target concentration ratio

^c Analytical to nominal concentration ratio

^d Less than the minimum detection limit of 10 ppm

WPC/esk/0764P-2

03-17-87

TABLE 2
DEVELOPMENTAL TOXICITY EXPOSURE RANGE-FINDING STUDY OF INHALED
1,1,1-TRICHLOROETHANE IN NEW ZEALAND WHITE RABBITS
DISTRIBUTION AND FATE

PPM	0	1000	3000	6000
	NO. (%)	NO. (%)	NO. (%)	NO. (%)
FEMALES ON STUDY	8	8	8	8
FEMALES THAT DIED	0	0	0	0
FEMALES THAT ABORTED	0	0	0	0
FEMALES THAT DELIVERED EARLY	0	0	0	0
FEMALES REMOVED FROM STUDY	0	0	0	0
FEMALES EXAMINED AT LAPAROTOMY	8 (100.0)	8 (100.0)	8 (100.0)	8 (100.0)
NONPREGNANT	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
PREGNANT	8 (100.0)	8 (100.0)	8 (100.0)	8 (100.0)
DOES WITH RESORPTIONS ONLY ^a	0 (0.0)	0 (0.0)	0 (0.0)	1 (12.5)
DOES WITH VIABLE FETUSES	8 (100.0)	8 (100.0)	8 (100.0)	7 (87.5)

^a The totally resorbed litter was detected by ammonium sulfide staining and examination of the uterus at scheduled sacrifice.

TABLE 3
DEVELOPMENTAL TOXICITY EXPOSURE RANGE-FINDING STUDY OF INHALED
1,1,1-TRICHLOROETHANE IN NEW ZEALAND WHITE RABBITS
BODY WEIGHTS AND WEIGHT CHANGE DURING GESTATION

PPM		0	1000	3000	6000
<u>BODY WEIGHTS (GRAMS)</u>					
GESTATIONAL DAY	0				
MEAN		3767.0	3727.8	3764.2	3720.5
S.D.		257.76	260.19	240.95	231.47
N		8	8	8	8
GESTATIONAL DAY	6				
MEAN		3958.5	3936.4	3915.1	3865.6
S.D.		267.53	257.62	257.66	271.21
N		8	8	8	8
GESTATIONAL DAY	9				
MEAN		3830.9	3856.8	3801.0	3758.6
S.D.		285.52	281.07	242.31	219.46
N		8	8	8	8
GESTATIONAL DAY	12				
MEAN		3828.6	3858.0	3779.9	3711.5
S.D.		252.62	277.78	253.15	180.87
N		8	8	8	8
GESTATIONAL DAY	15				
MEAN		3866.7	3895.8	3805.0	3722.6
S.D.		271.46	293.36	277.69	147.87
N		8	8	8	8
GESTATIONAL DAY	19				
MEAN		3844.8	3846.4	3745.2	3631.5
S.D.		256.52	256.80	301.83	176.91
N		8	8	8	8
<u>BODY WEIGHT CHANGE (GRAMS)</u>					
GESTATIONAL DAYS	0 TO 6				
(PRE-TREATMENT)					
MEAN		191.5	208.6	150.9	145.1
S.D.		91.76	66.97	67.38	66.73
N		8	8	8	8
GESTATIONAL DAYS	6 TO 19				
(TREATMENT)					
MEAN		-113.8	-90.0	-170.0	-234.1
S.D.		211.22	55.32	144.36	185.66
N		8	8	8	8
GESTATIONAL DAYS	6 TO 9				
MEAN		-127.6	-79.6	-114.1	-107.1
S.D.		73.48	73.35	78.59	86.65
N		8	8	8	8
GESTATIONAL DAYS	9 TO 12				
MEAN		-2.4	1.2	-21.1	-47.1
S.D.		78.13	90.48	56.42	61.29
N		8	8	8	8
GESTATIONAL DAYS	12 TO 15				
MEAN		38.1	37.9	25.1	11.1
S.D.		127.93	82.18	77.59	42.88
N		8	8	8	8

TABLE 3 (CONTINUED)
DEVELOPMENTAL TOXICITY EXPOSURE RANGE-FINDING STUDY OF INHALED
1,1,1-TRICHLOROETHANE IN NEW ZEALAND WHITE RABBITS
BODY WEIGHTS AND WEIGHT CHANGE DURING GESTATION

PPM		0	1000	3000	6000
GESTATIONAL DAYS	15 TO 19				
MEAN		-21.9	-49.4	-59.8	-91.0
S.D.		141.32	94.69	39.69	52.14
N		8	8	8	8
GESTATIONAL DAYS	0 TO 19				
(GESTATION)					
MEAN		77.7	118.7	-19.0	-89.0
S.D.		213.82	68.61	167.05	138.71
N		8	8	8	8
MEAN DIFFERENCES CALCULATED FROM INDIVIDUAL DIFFERENCES					

TABLE 4

DEVELOPMENTAL TOXICITY EXPOSURE RANGE-FINDING STUDY OF INHALED
1,1,1-TRICHLOROETHANE IN NEW ZEALAND WHITE RABBITS
INCIDENCE OF CLINICAL OBSERVATIONS BY GESTATION DAY

CATEGORY	FINDING (LOCATION)	GESTATIONAL DAYS	1,1,1-TRICHLOROETHANE (PPM, inhalation)			
			0	1000	3000	6000
NORMAL	NO SIGNIFICANT CLINICAL OBSERVATIONS	0- 5 6- 19	8 ^a 8	8 8	8 8	8 8
DEAD	SCHEDULED SACRIFICE	6- 19	8	8	8	8
EYES/EARS/NOSE	OCULAR DISCHARGE, OTHER (EYE-RIGHT)	6- 19	0	0	0	1
EXCRETA	LOOSE FECES	6- 19	0	0	0	1
	DRY RED MATERIAL ON PAPERBOARD ^b	6- 19	0	0	0	1
	UNABLE TO HEMASTIX	6- 19	0	0	0	1
	BLOOD BY HEMASTIX ON TRAY BENEATH CAGE	6- 19	0	1	0	0

^a Number of does exhibiting the observation.

^b This observation was noted in the morning, prior to exposure, on gestation day 6 for that animal.

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TABLE 5
DEVELOPMENTAL TOXICITY EXPOSURE RANGE-FINDING STUDY OF INHALED
1,1,1-TRICHLOROETHANE IN NEW ZEALAND WHITE RABBITS
MATERNAL GROSS OBSERVATIONS AT NECROPSY - INCIDENCE SUMMARY

PPM	0	1000	3000	6000
NUMBER OF PREGNANT DOES	8	8	8	8
CORPORA LUTEA -CORPORA ALBICANS	0 ^a	0	0	1 ^b
UTERUS -NO BLOCKAGE ,LEFT HORN	1	0	1	0
AMNIOTIC SACS -ABSENT	0	0	0	1 ^b
PLACENTAS -ABSENT	0	0	0	1 ^b
LUNGS -COLOR CHANGE	0	0	1 ^c	0
-EDEMA	0	0	1 ^c	0
-TISSUE SAVED	0	0	1 ^c	0

^a Number of does with gross observation.

^b This doe was found to be pregnant by amonium sulfide staining of the uterus.

^c Same doe.

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TABLE 6
DEVELOPMENTAL TOXICITY EXPOSURE RANGE-FINDING STUDY OF INHALED
1,1,1-TRICHLOROETHANE IN NEW ZEALAND WHITE RABBITS
MATERNAL ORGAN WEIGHTS AT SACRIFICE

PPM	0	1000	3000	6000
INITIAL BODY WEIGHT (GRAMS)				
MEAN	3767.0	3727.8	3764.2	3720.5
S.D.	257.76	260.19	240.95	231.47
N	8	8	8	8
BODY WEIGHT AT SACRIFICE (GRAMS)				
MEAN	3844.8	3846.4	3745.2	3631.5
S.D.	256.52	256.80	301.83	176.91
N	8	8	8	8
GRAVID UTERINE WEIGHT (GRAMS)				
MEAN	163.27	177.91	158.46	144.65
S.D.	31.65	19.04	28.58	41.69
N	8	8	8	8
CORRECTED BODY WEIGHT (GRAMS) ^a				
MEAN	3681.51	3668.53	3586.73	3486.90
S.D.	243.55	243.12	296.33	187.29
N	8	8	8	8
CORRECTED BODY WEIGHT CHANGE (GRAMS) ^b				
MEAN	-85.53	-59.25	-177.47	-233.63
S.D.	220.95	73.74	176.11	169.70
N	8	8	8	8
LIVER WEIGHT (GRAMS)				
MEAN	108.72	84.48	93.49	88.74
S.D.	17.92	12.88	26.55	11.74
N	8	8	8	8
RELATIVE LIVER WEIGHT (%) ^c				
MEAN	2.96	2.30**	2.58	2.54
S.D.	0.47	0.29	0.50	0.23
N	8	8	8	8

^a Corrected body weight = body weight at sacrifice minus gravid uterine weight.

^b Corrected body weight change = body weight at sacrifice minus gravid uterine weight minus initial body weight.

^c Calculated as a percentage of the corrected body weight.

** p < 0.01 compared to control.

TABLE 7

DEVELOPMENTAL TOXICITY EXPOSURE RANGE-FINDING STUDY OF INHALED
1,1,1-TRICHLOROETHANE IN NEW ZEALAND WHITE RABBITS
GESTATIONAL PARAMETERS AT SACRIFICE

PPM	0	1000	3000	6000
NO. PREGNANT DOES	8	8	8	8
CORPORA LUTEA/DOE				
MEAN	10.1	10.9	9.5	9.1
S.D.	1.1	1.8	1.8	2.0
N	8	8	8	7 ^a
TOTAL IMPLANTS/LITTER				
MEAN	8.9	10.1	8.3	8.0
S.D.	2.7	1.5	1.4	2.6
N	8	8	8	8
PERCENT PREIMPLANTATION LOSS ^b				
MEAN	15.0	6.2	11.5	4.3
S.D.	23.2	8.1	15.1	5.5
N	8	8	8	7 ^a
VIABLE IMPLANTS				
MEAN	8.1	10.1	8.1	7.4
S.D.	2.3	1.5	1.6	3.2
N	8	8	8	8
NON-VIABLE IMPLANTS				
MEAN	0.8	0.0 ^{**}	0.1 [*]	0.6
S.D.	0.7	0.0	0.4	1.2
N	8	8	8	8
EARLY RESORPTIONS				
MEAN	0.5	0.0	0.1	0.4
S.D.	0.8	0.0	0.4	1.1
N	8	8	8	8
LATE RESORPTIONS				
MEAN	0.2	0.0	0.0	0.2
S.D.	0.5	0.0	0.0	0.7
N	8	8	8	8
DEAD FETUSES				
MEAN	0.0	0.0	0.0	0.0
S.D.	0.0	0.0	0.0	0.0
N	8	8	8	8
PERCENT LIVE FETUSES				
MEAN	92.8	100.0 [*]	98.2	85.2
S.D.	6.6	0.0	5.1	35.0
N	8	8	8	8

^a The N is reduced because the data from one doe with no corpora lutea (no viable implants) were removed from the calculations.

^b Percent preimplantation loss = corpora lutea minus total implants divided by corpora lutea multiplied by 100.

* p < 0.05 compared to control.

** p < 0.01 compared to control.

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