

FINAL REPORT

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS

VOLUME II

CONTRACT NO. 210-78-0033
BORRISTON PROJECT NO. 0102

Submitted to:
Experimental Toxicology Branch
Division of Biomedical and Behavioral Science
National Institute for Occupational Safety and Health

Initiation Date: September 28, 1978
Termination Date: July 15, 1983
Issue Date: October 15, 1984

Submitted by:
Borrison Laboratories, Inc.
5050 Beech Place
Temple Hills, Maryland 20748

REPORT DOCUMENTATION PAGE		1. REPORT NO.	2.	3. Recipient's Accession No. P03 5 215184 /AS
4. Title and Subtitle Carcinogenic Potential Of Condensed Pyrolysis Effluents From Iron Foundry Casting Operations, Volume II			5. Report Date 84/10/15	
7. Author(s) Shellenberg, T. E., F. M. Garner, and L. J. Plankenhorn			8. Performing Organization Rept. No. 210-78-0033	
9. Performing Organization Name and Address Experimental Toxicology Branch, Division of Biomedical and Behavioral Science, NIOSH, U.S. Department of Health and Human Services, Cincinnati, Ohio			10. Project/Task/Work Unit No.	
			11. Contract(C) or Grant(G) No. (C) (G)	
12. Sponsoring Organization Name and Address Same as box 9.			13. Type of Report & Period Covered	
			14.	
15. Supplementary Notes				
16. Abstract (Limit: 200 words) Data tabulations for a carcinogenic bioassay of condensed effluents obtained from iron foundry casting operations that used hamsters as the test species are presented. The tables include sample collected rate, pH of collected samples, solubility of foundry samples in water and cyclohexane, and the elemental composition of furan (110009), urethane (51796), shell sand, and green sand effluents. Cumulative hamster mortality and survival data are presented. Data on the incidence of pharmacotoxic signs such as wheezing, dyspnea, polypnea, hunched back, ataxia, soft feces, squinting eyes, alopecia and soiled anal areas occurring during weeks 8 through 116 in male hamsters and weeks 6 through 102 in females are tabulated. Data tabulations of mean body weights of males for weeks 1 through 111, and weeks 11 through 102 for females are presented. Histopathological findings in the larynx, trachea, and lung during a preliminary acute range finding study are summarized. Cumulative mortality and body weight changes during the acute study are presented. Photographs and diagrams of the samplers and sampling trains are also presented.				
17. Document Analysis a. Descriptors				
b. Identifiers/Open-Ended Terms NIOSH-Publication, NIOSH-Contract, Pyrolysis, Iron-oxide-fumes, Iron-working-industry, Data-processing, Quantitative-analysis, Lung-fibrosis, Equipment-design, Pharmacodynamics, Toxicology, Contract-210-78-0033				
c. COSATI Field/Group				
18. Availability Statement		19. Security Class (This Report)		21. No. of Pages 198
		20. Security Class (This Page)		22. Price



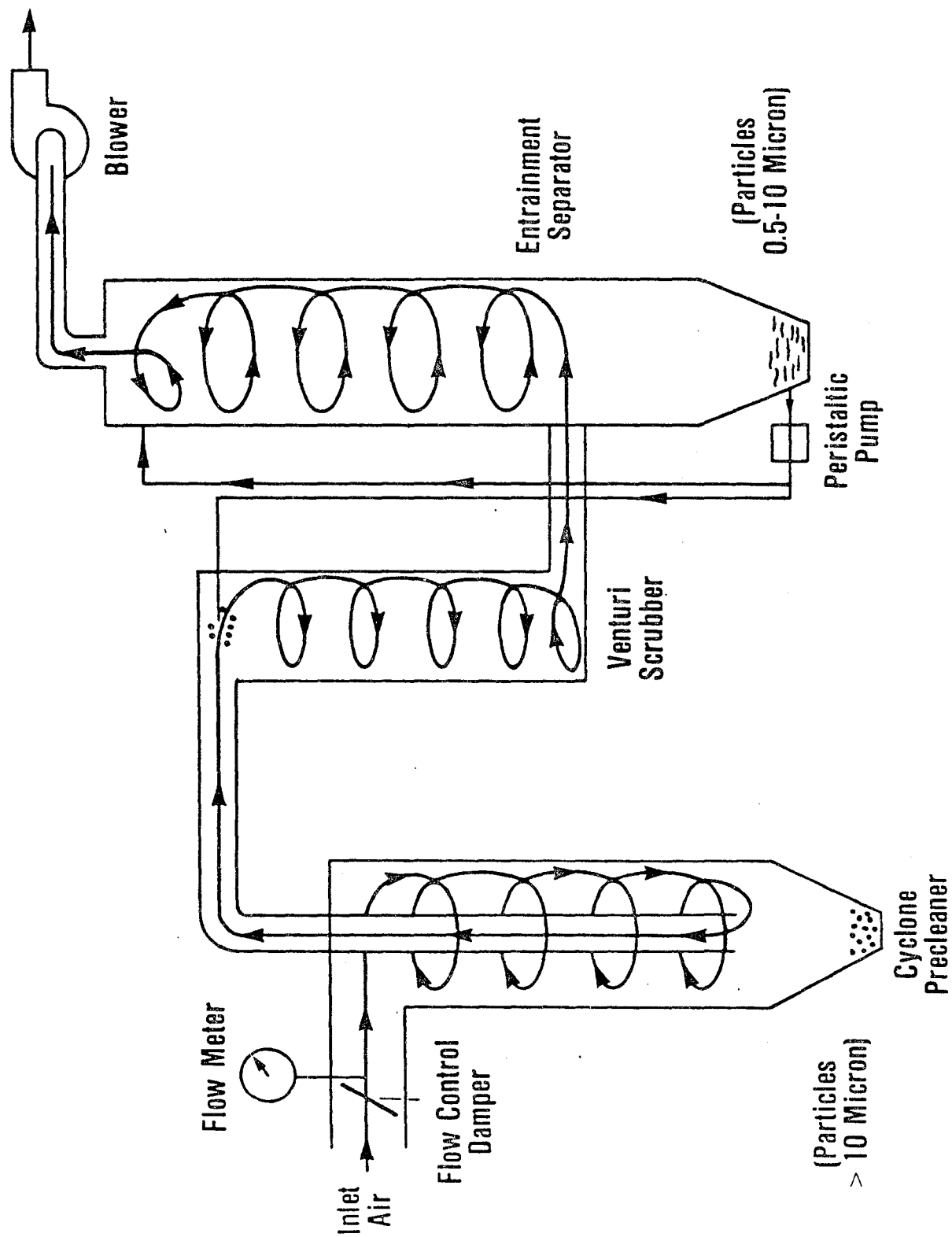


Figure 1. Schematic of sampler.

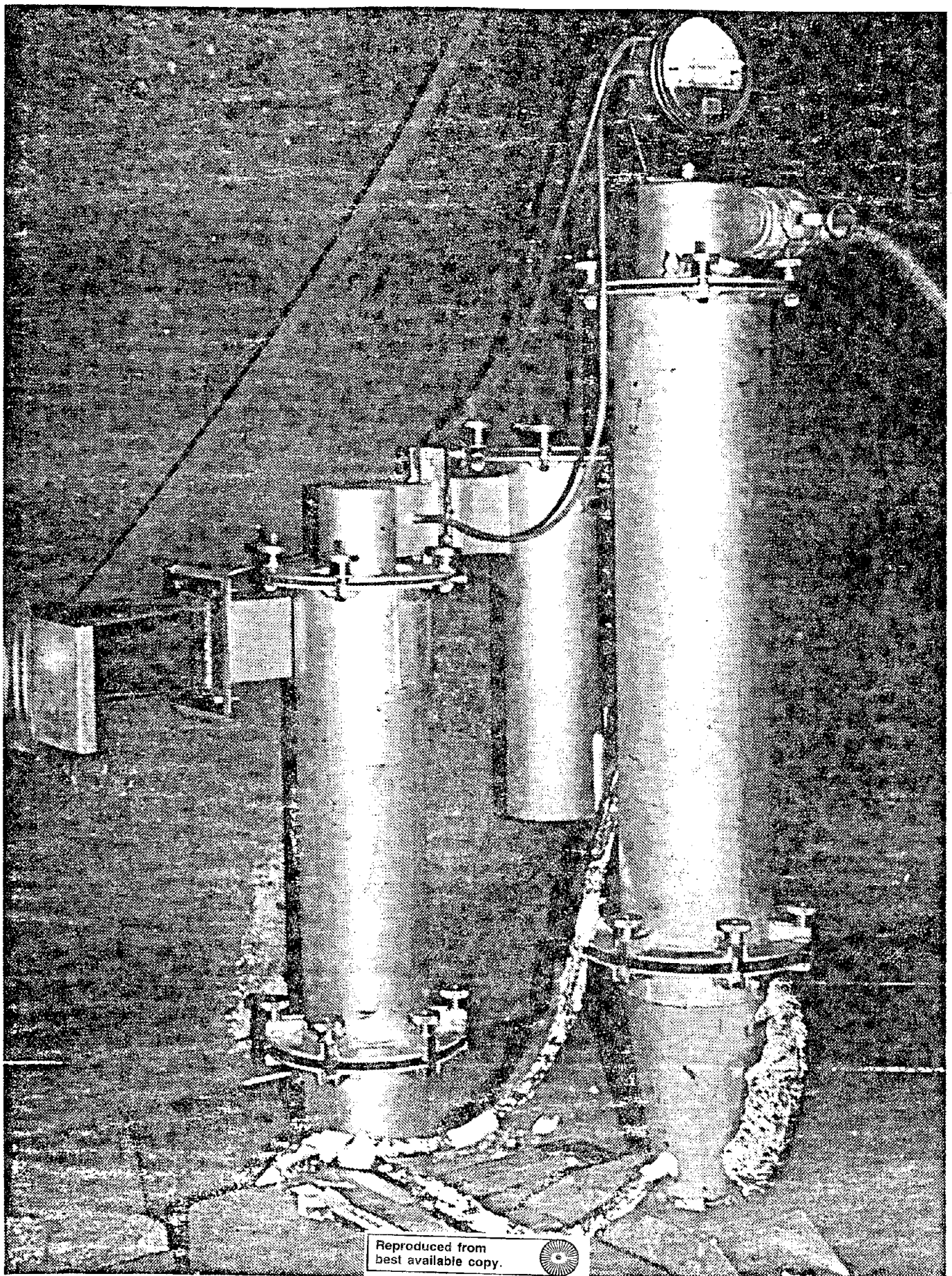


Figure 2. Scrubber sampler during operation.

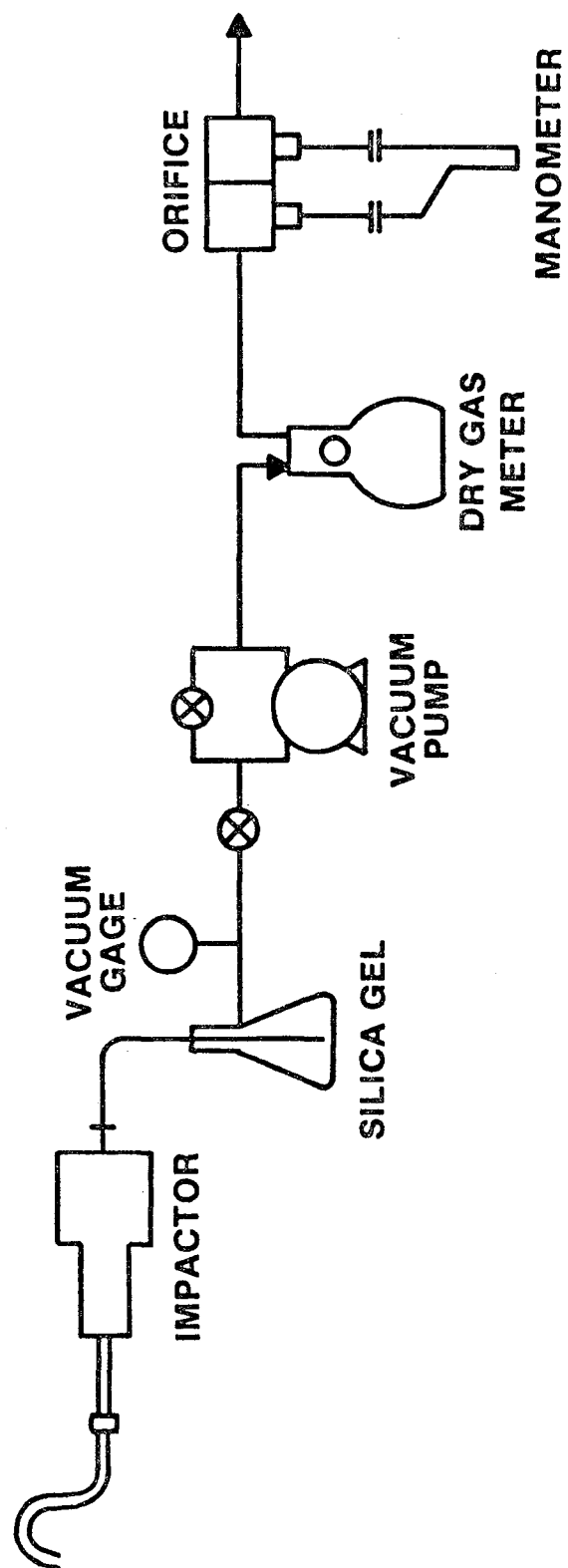


Figure 3. Modified EPA 5 sampler train used for the efficiency tests.

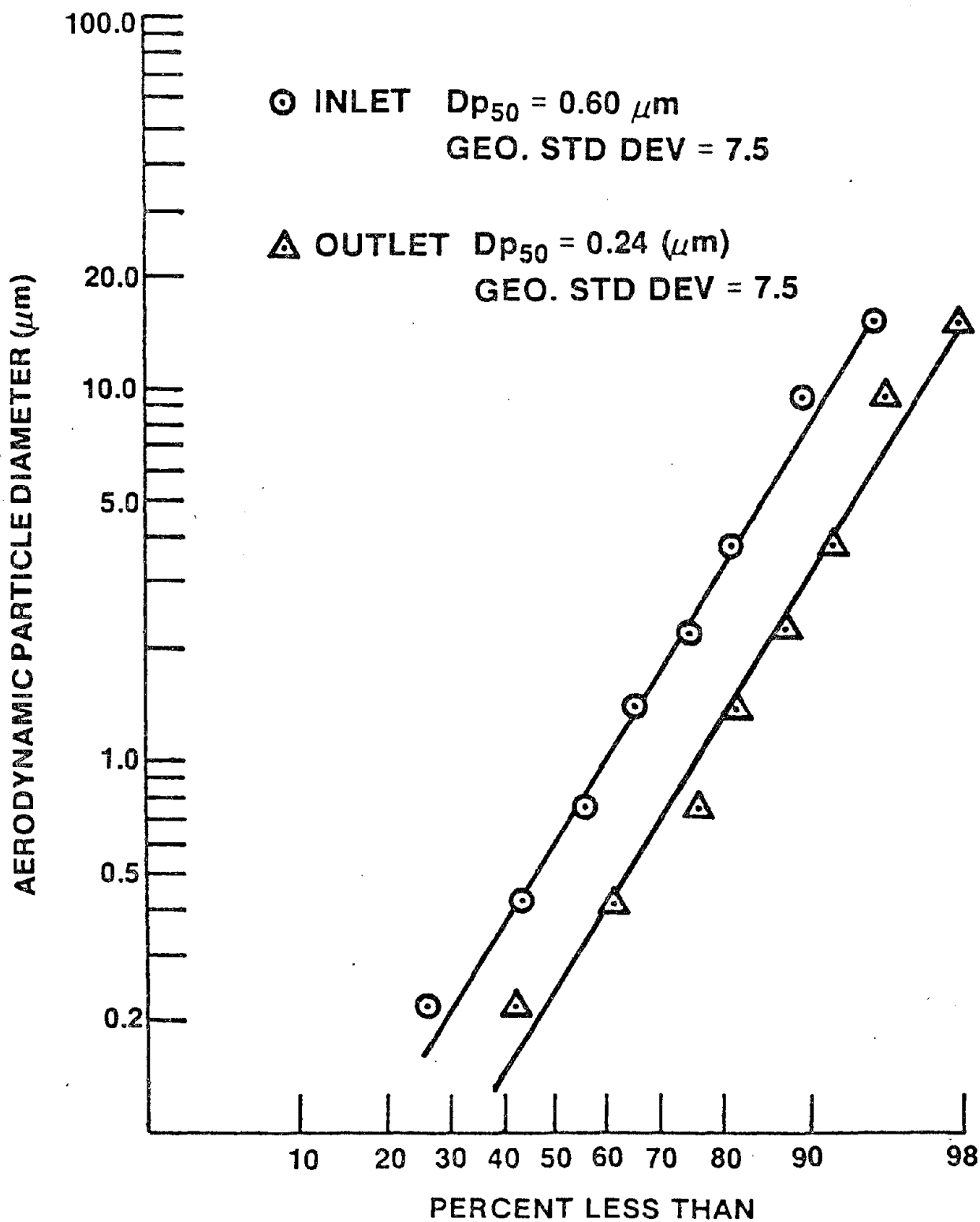


Figure 4. Aerodynamic particle size distributions (by weight) in the airstreams at the inlet and outlet to the sampler.

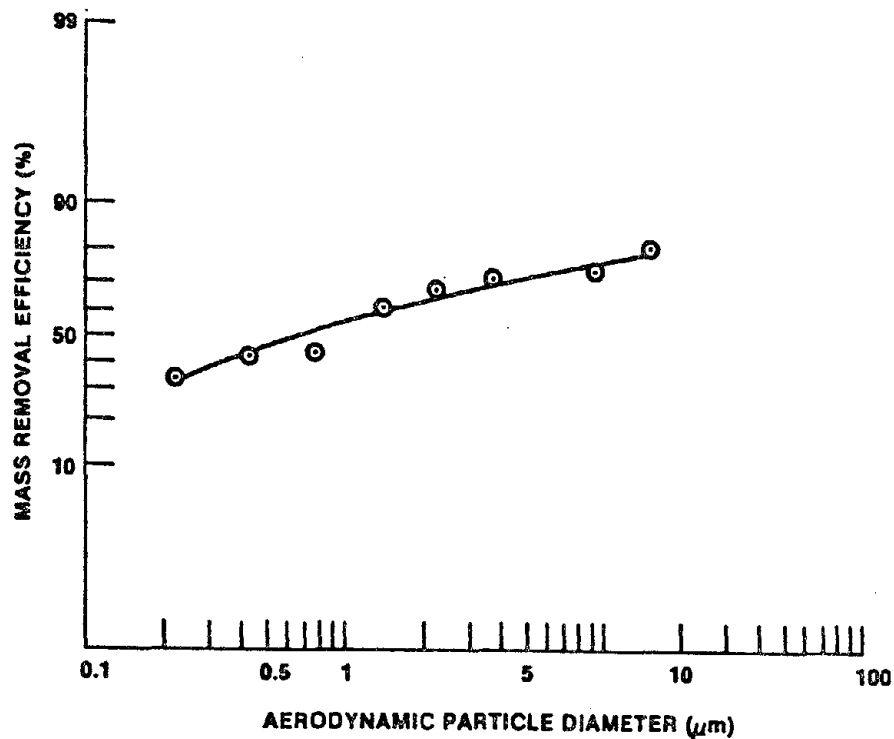


Figure 5. Fractional removal efficiency of the scrubber.

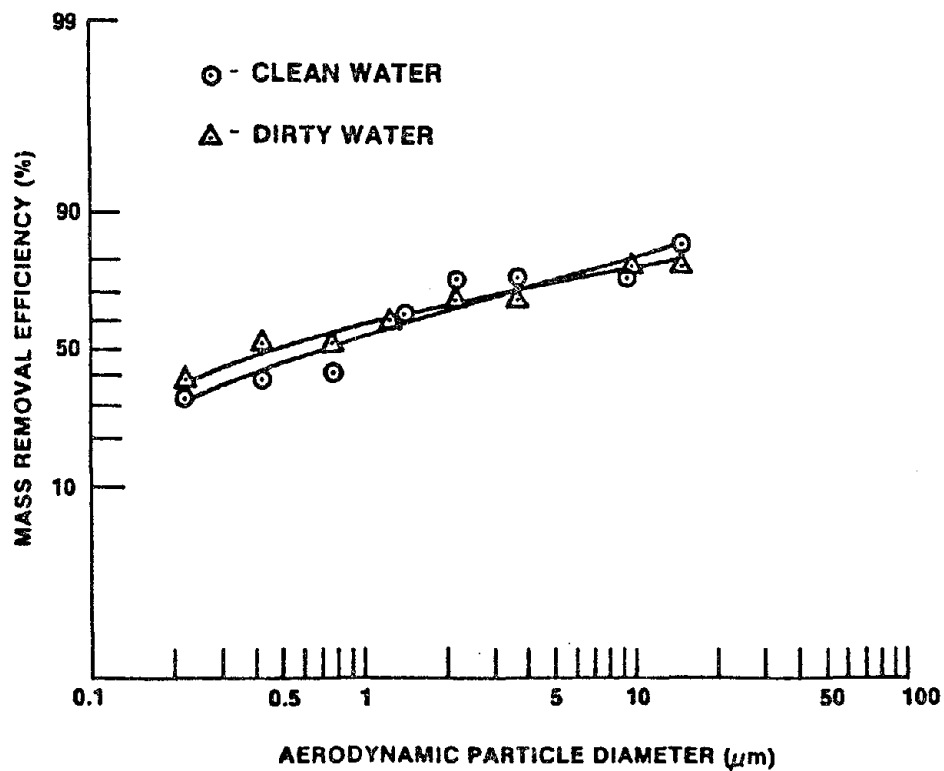


Figure 6. Fractional removal efficiency with clean and dirty scrubber water.

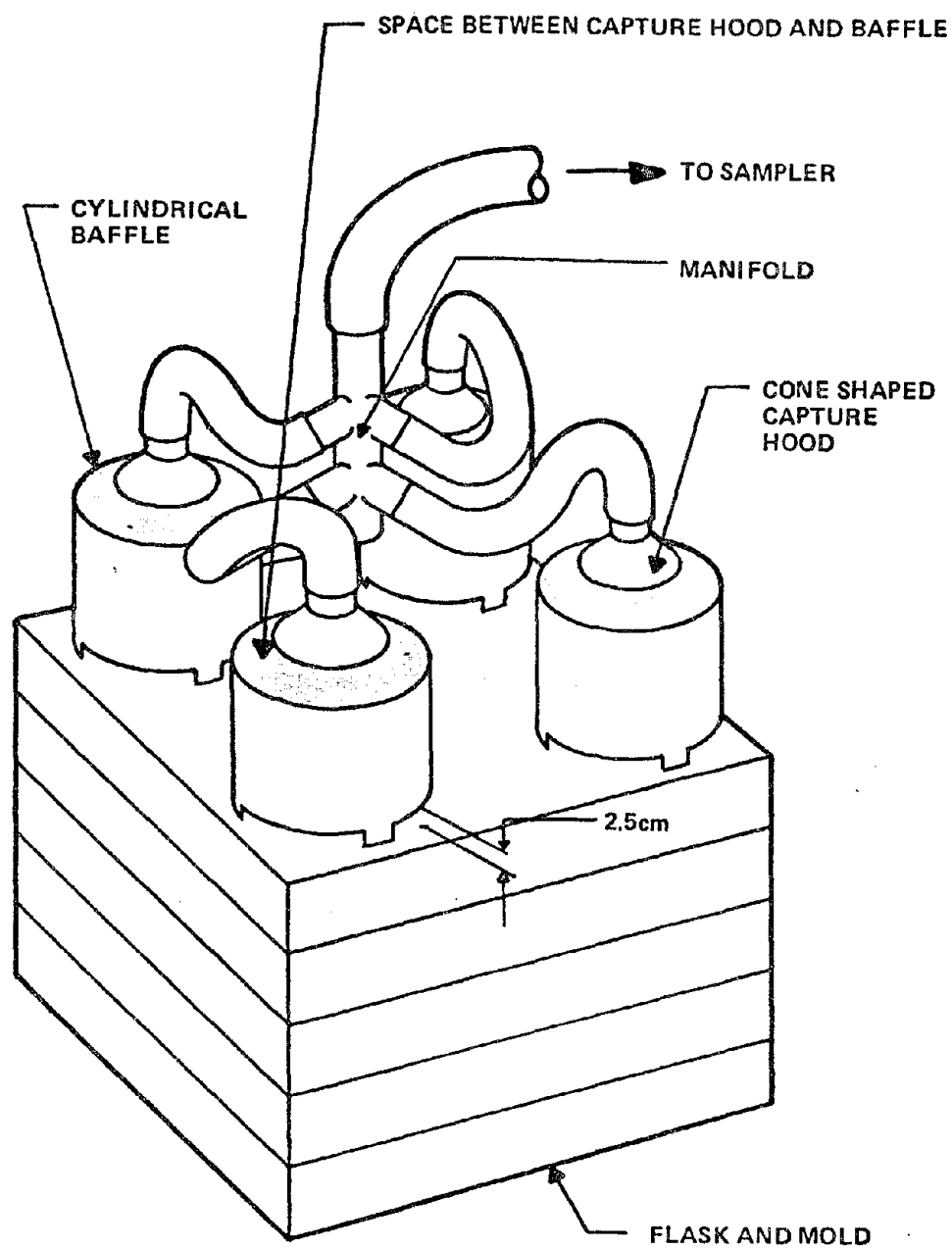


Figure 7. FURAN MOLDS: SAMPLING HOODS LOCATED ABOVE GAS VENTS IN MOLD

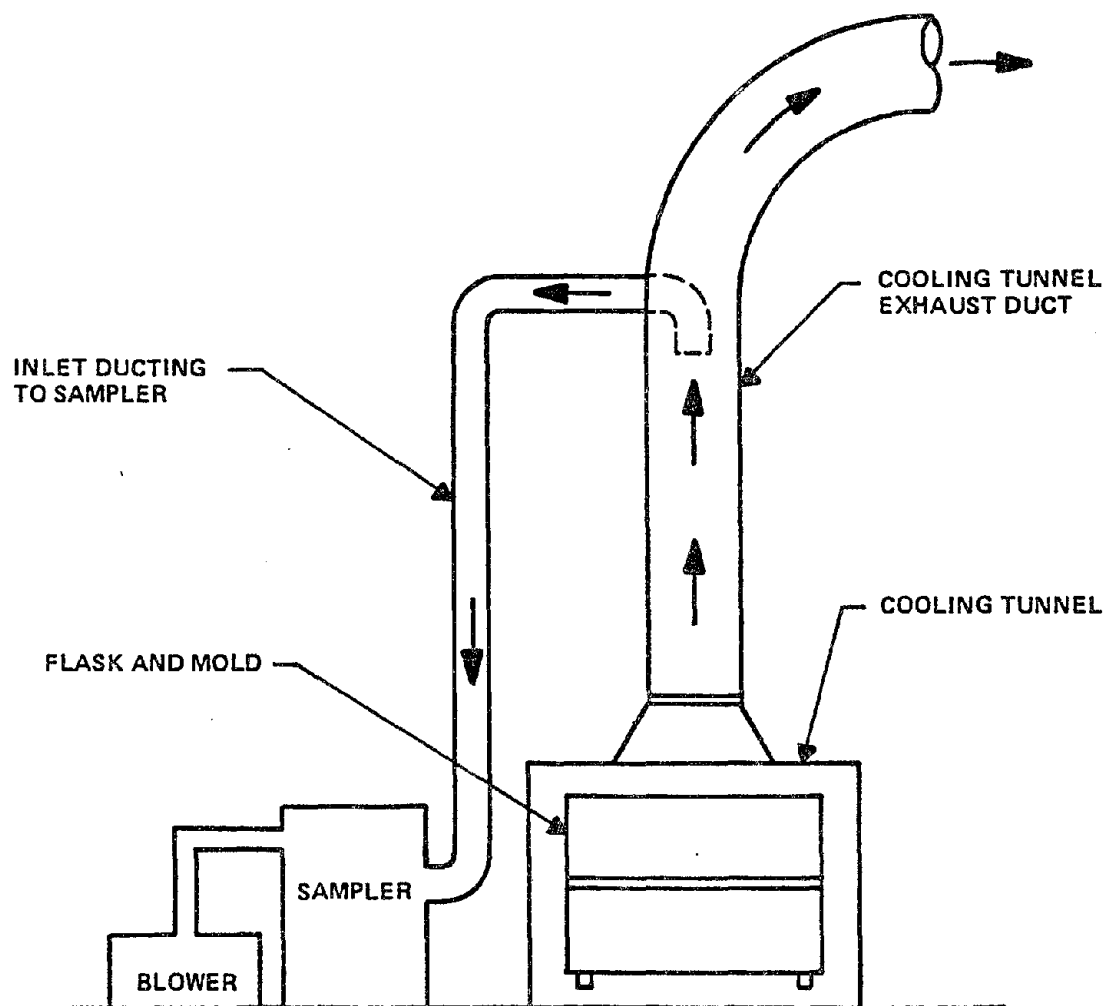


Figure 8. GREEN SAND MOLDS: END VIEW OF COOLING TUNNEL

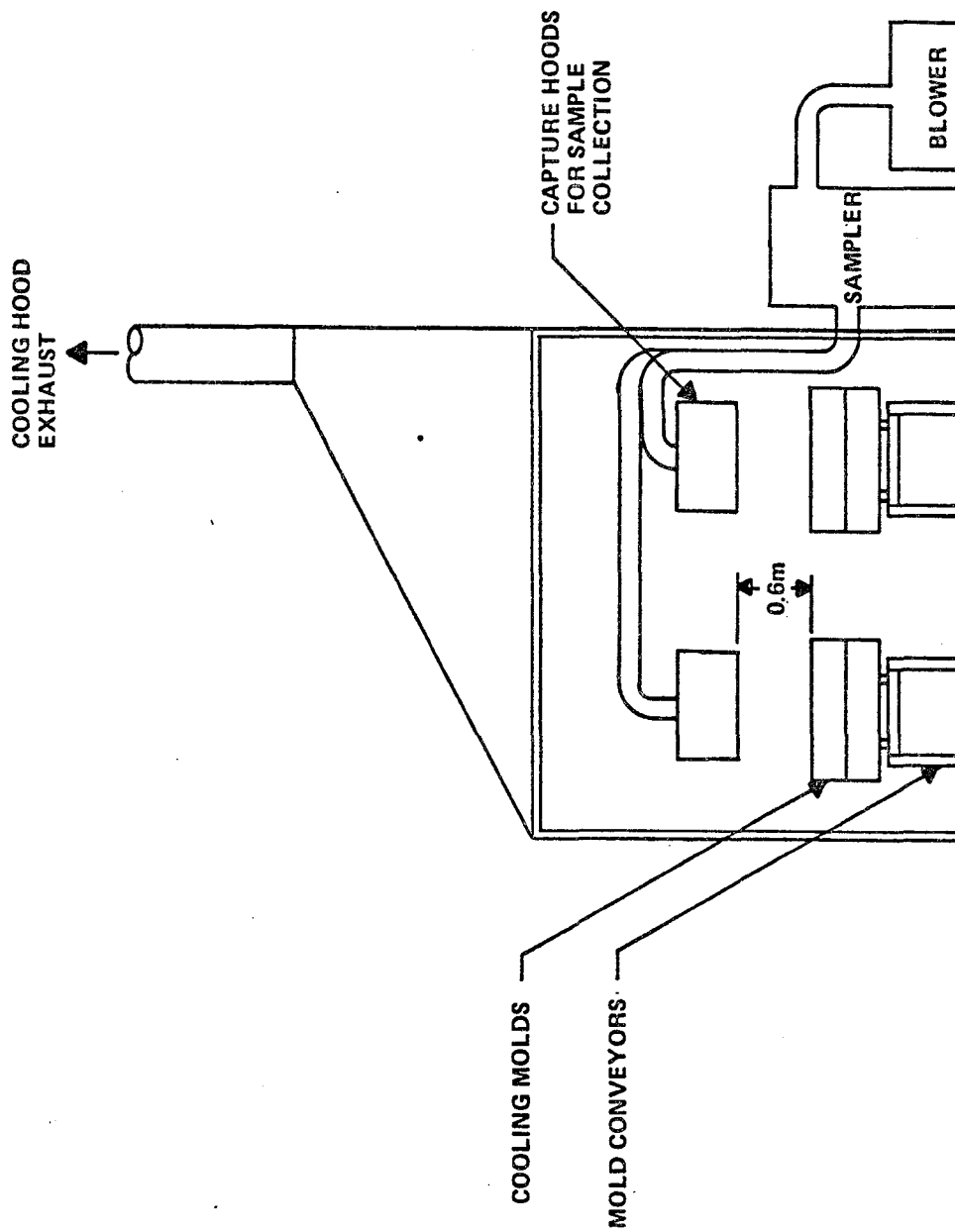


Figure 9. URETHANE MOLDS – CAPTURE HOODS INSIDE COOLING TUNNEL

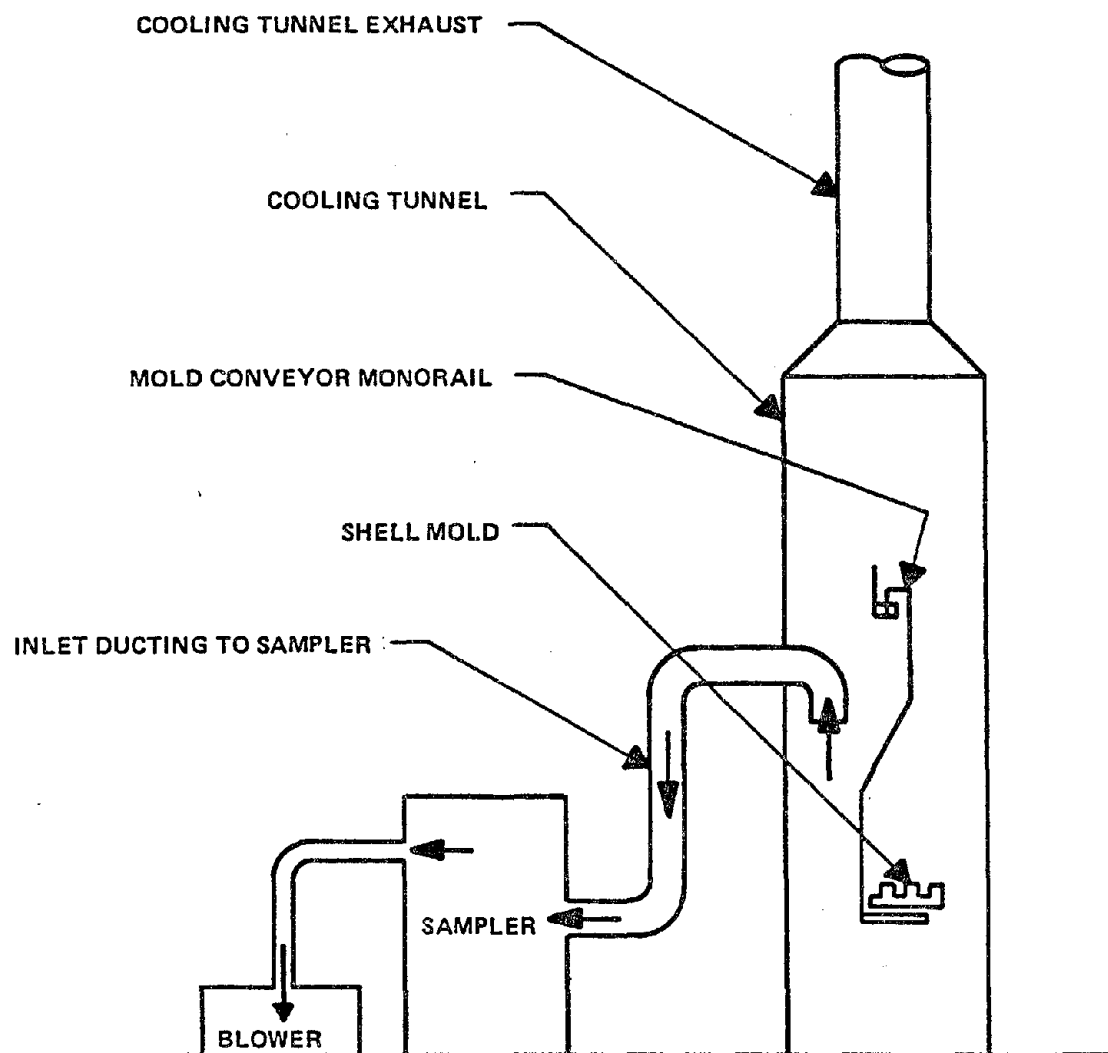


Figure 10. SHELL MOLDS – END VIEW OF COOLING TUNNEL

TABLE 1

COLLECTION RATES*

MOLD	GRAMS PER SAMPLE**	HOURS PER SHIFT	NUMBER OF SHIFTS
FURAN	45	2	24
URETHANE	26	7 ½	33
SHELL	35	7 ½	9
GREEN SAND	36	7 ½	10

* SAMPLES WERE COLLECTED CONTINUOUSLY DURING THE SHIFT.

** TOTAL AMOUNT OF EMISSIONS COLLECTED FOR CHRONIC BIOASSAY AND ATTENDANT CHEMICAL ANALYSES.

TABLE 2

PH OF COLLECTED SAMPLES

MOLD	PH
FURAN	2.0
URETHANE	6.3
SHELL	8.0
GREEN SAND	1.8

TABLE 3

SOLUBILITY OF FOUNDRY SAMPLES IN WATER AND CYCLOHEXANE

MOLD	% SAMPLE INSOLUBLE IN WATER	% PARTICULATE SOLUBLE IN CYCLOHEXANE	% TOTAL SAMPLE SOLUBLE IN CYCLOHEXANE
FURAN	10-15	19	2-3
URETHANE	1-2	16	0.2-0.3
SHELL	50	35	18
GREEN SAND	20-25	36	7-9

TABLE 4
CARBON AND HYDROGEN CONTENT OF
CYCLOHEXANE-WASHED PARTICULATES

<u>MOLD</u>	<u>PERCENT CARBON</u>	<u>PERCENT HYDROGEN</u>
FURAN	22.95	4.78
URETHANE	30.99	4.38
SHELL	85.16	1.89
GREEN SAND	44.93	4.4

TABLE 5
RATIO OF CARBON TO HYDROGEN ATOMS IN
CYCLOHEXANE-WASHED PARTICULATES

<u>MOLD</u>	<u>NO. C ATOMS : NO. H ATOMS</u>
FURAN	0.4 : 1
URETHANE	0.6 : 1
SHELL	3.7 : 1
GREEN SAND	0.8 : 1

TABLE 6
ELEMENTAL COMPOSITION OF FURAN MOLD EFFLUENTS

Element	mg/gm	Percent of total*
Aluminum	0.306	2.5
Arsenic	< 0.013	< 0.1
Beryllium	< 0.003	< 0.02
Cadmium	0.022	0.2
Chromium	0.005	0.04
Cobalt	< 0.055	< 0.5
Copper	0.039	0.3
Iron	8.08	65.8
Lead	0.36	2.9
Magnesium	0.023	0.2
Manganese	1.71	13.9
Mercury	< 0.0001	-
Nickel	0.028	0.2
Silicon	4.87	
Silica	6.96	
Tin	0.114	0.9
Zinc	1.6	13.0

*Percent of each element in total quantity of measured elements minus silicon and silica.

TABLE 7
ELEMENTAL COMPOSITION OF URETHANE MOLD EFFLUENTS

Element	mg/gm	Percent of total*
Aluminum	0.194	6.8
Arsenic	0.006	0.2
Beryllium	< 0.0005	<.02
Cadmium	< 0.001	<.03
Chromium	< 0.001	<.03
Cobalt	< 0.0055	< 0.2
Copper	0.011	0.4
Iron	0.117	4.1
Lead	1.28	44.6
Magnesium	1.0	34.8
Manganese	0.194	6.8
Mercury	< 0.00002	—
Nickel	0.007	0.2
Silicon	6.44	
Silica	8.22	
Tin	0.017	0.6
Zinc	0.037	1.3

*Percent of each element in total quantity of measured elements minus silicon and silica.

TABLE 8
ELEMENTAL COMPOSITION OF SHELL MOLD EFFLUENTS

Element	mg/gm	Percent of total*
Aluminum	0.512	17.7
Arsenic	0.008	0.3
Beryllium	<0.003	<0.1
Cadmium	0.01	0.3
Chromium	0.007	0.2
Cobalt	<0.014	<0.5
Copper	0.02	0.7
Iron	0.89	30.8
Lead	0.03	1.0
Magnesium	0.48	16.6
Manganese	0.096	3.3
Mercury	< 0.00002	—
Nickel	0.014	0.5
Silicon	16.8	
Silica	20.6	
Tin	0.66	22.8
Zinc	0.15	5.2

*Percent of each element in total quantity of measured elements minus silicon and silica.

TABLE 9
ELEMENTAL COMPOSITION OF GREEN SAND MOLD EFFLUENTS

Element	mg/gm	Percent of total*
Aluminum	0.74	6.4
Arsenic	0.06	0.5
Beryllium	<0.003	<0.03
Cadmium	0.01	0.09
Chromium	0.012	0.1
Cobalt	<0.012	<0.1
Copper	0.048	0.42
Iron	4.55	39.5
Lead	3.48	30.2
Magnesium	0.96	8.3
Manganese	0.133	1.2
Mercury	<0.0005	—
Nickel	0.012	0.10
Silicon	21.0	
Silica	21.9	
Tin	0.21	1.8
Zinc	1.3	11.3

*Percent of each element in total quantity of measured elements minus silicon and silica.

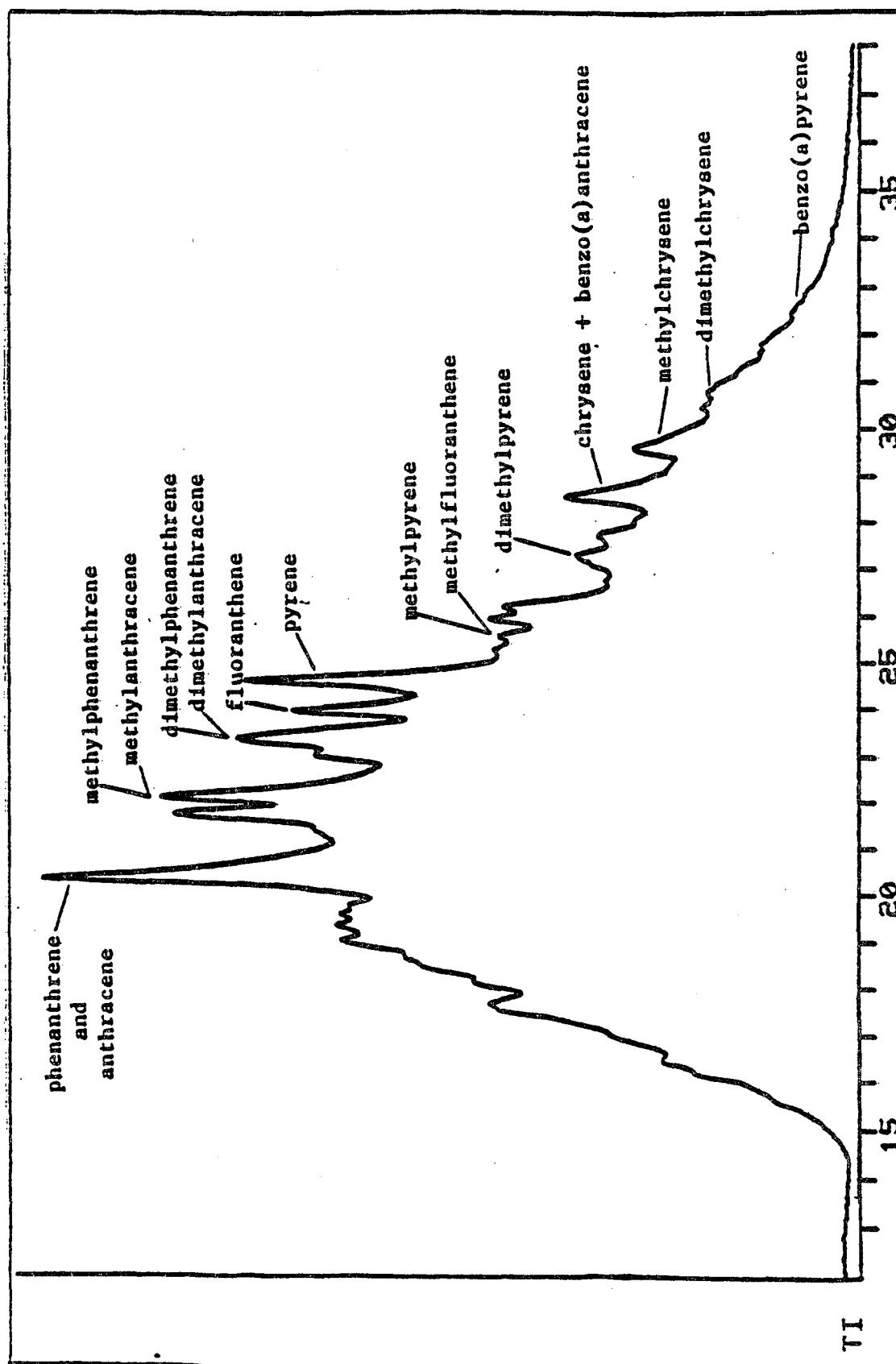


Figure 11a. Reconstructed total ion current chromatogram
cyclohexane extract of green sand particulates

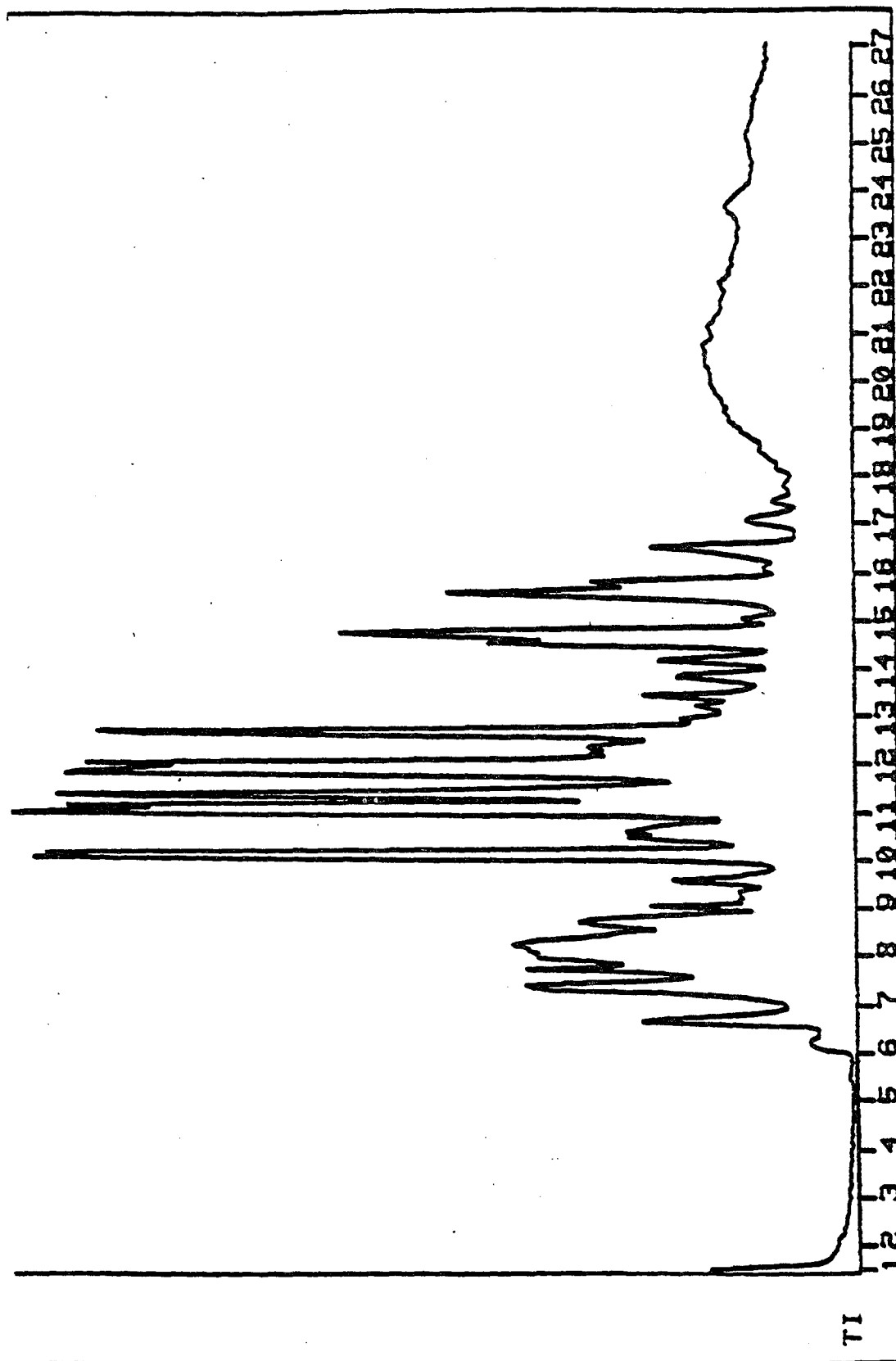


Figure 11b. Total ion current chromatogram by GC/MS of cyclohexane extract of water-insoluble particulate in shell sample for the determination of PAH-type compounds.

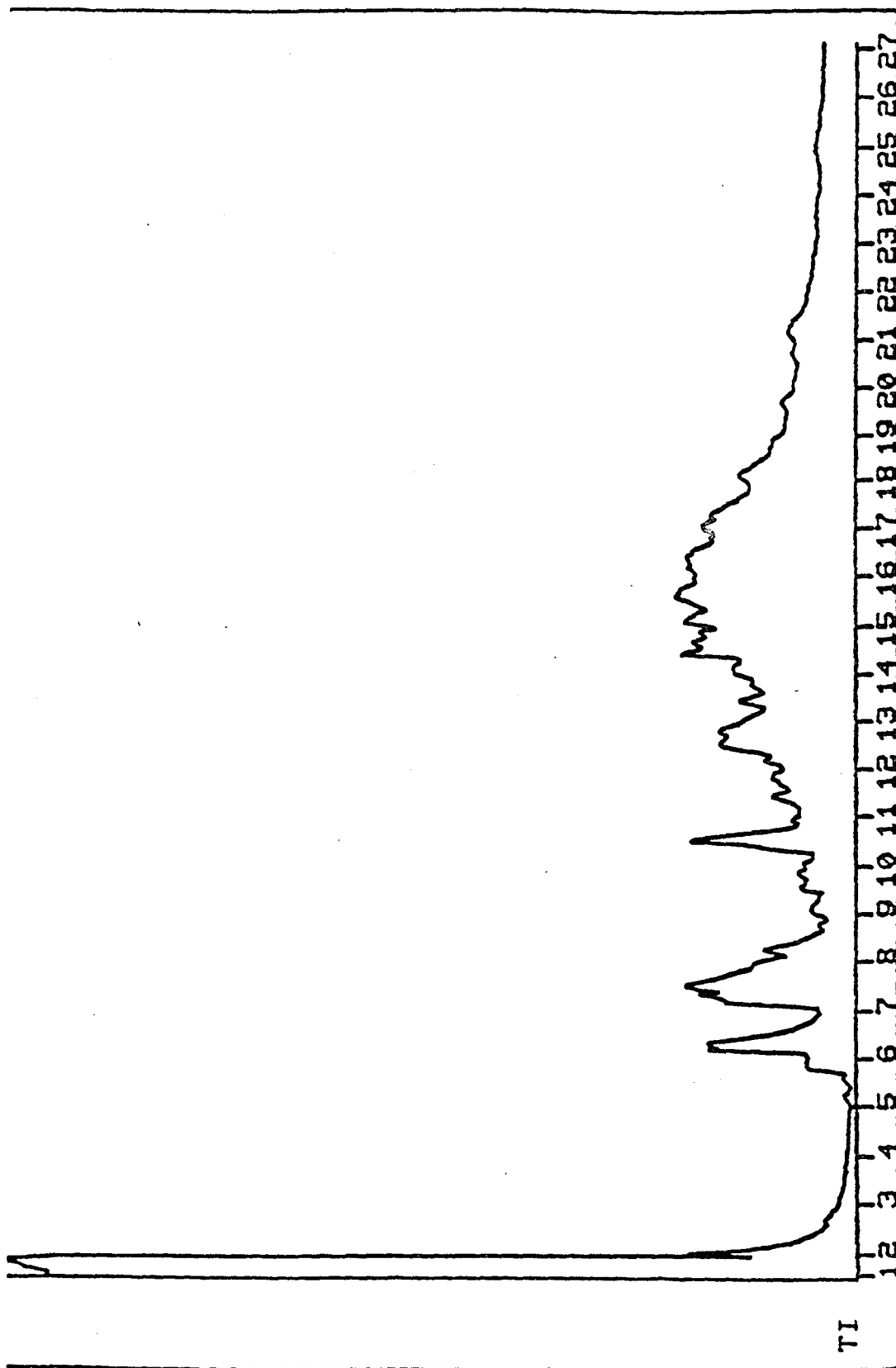


Figure 11c. Total ion current chromatogram by GC/MS of cyclohexane extract of water insoluble particulate in urethane sample for the determination of PAH-type compounds.

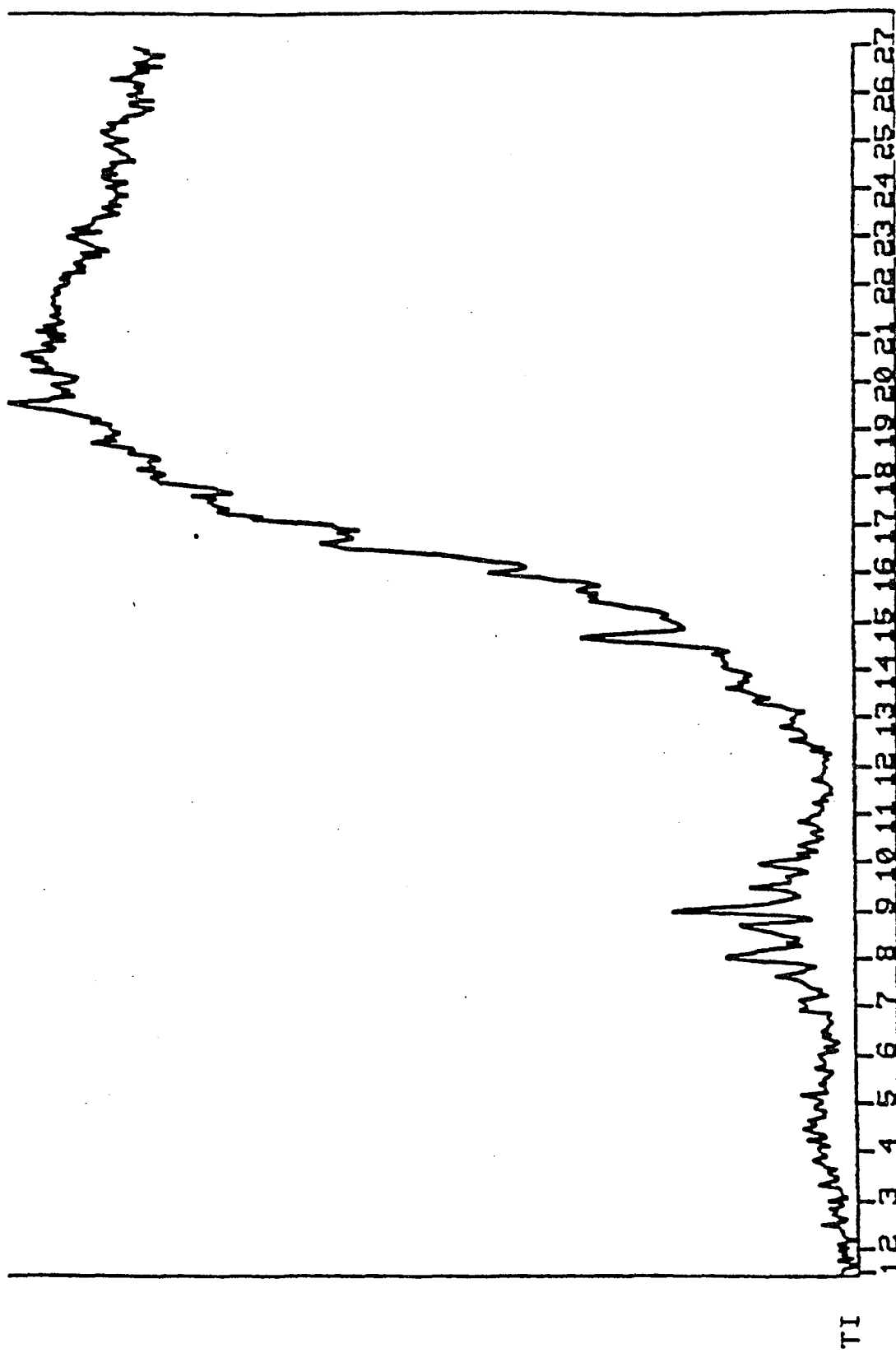


Figure 11d. Total ion concentration by GC/MS of cyclohexane extract of water insoluble particulate in furan sample for the determination of PAH-type compounds.

TABLE 10

CONCENTRATIONS OF PAH AND RELATED COMPOUNDS IN CYCLOHEXANE
EXTRACTS OF WATER-INSOLUBLE PARTICULATE (19/9 PARTICULATE)

COMPOUND	FURAN	URETHANE	SHELL	GREEN SAND
ACRIDINE	< 0.6	< 0.6	< 0.6	< 0.6
NAPHTHALENE	< 0.6	12	< 0.6	< 0.6
CARBAZOLE	< 0.6	< 0.6	< 0.6	< 0.6
PHENANTHRENE	31	230	1500	7200
BENZO (a) ANTHRACENE	< 0.6	5.4	350	1100
CHRYSENE				
BENZO (a) PYRENE	< 0.6	< 0.6	270	230
DIBENZO (a, h) - ANTHRACENE	< 0.6	< 0.6	< 0.6	< 0.6

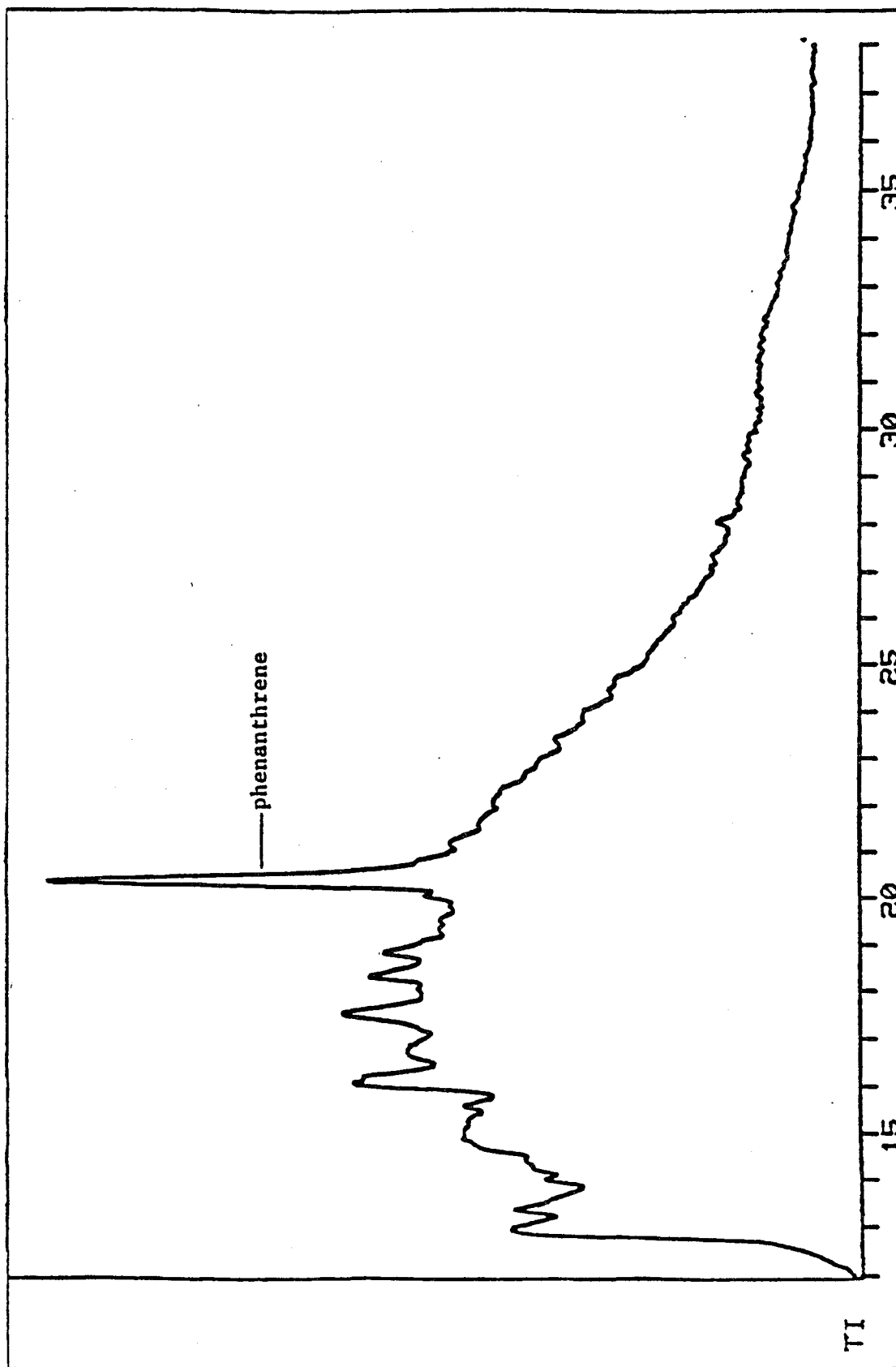


Figure 12a. Reconstructed total ion current chromatogram of the base/neutral extract of aqueous phase, green sand

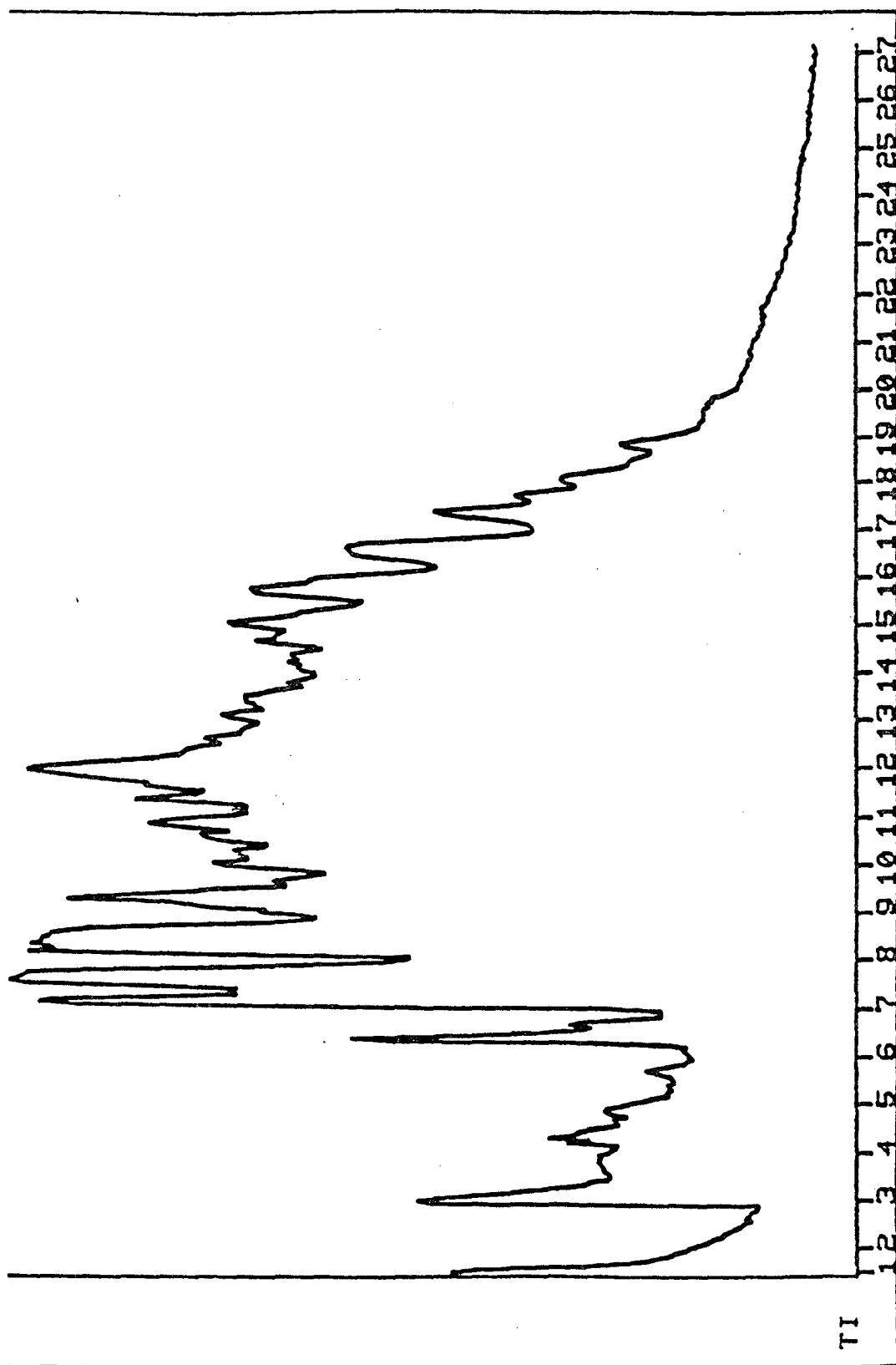


Figure 12b. Total ion current chromatogram by GC/MS of methylene chloride extract of aqueous phase in shell sample for the determination of PAH-type compounds.

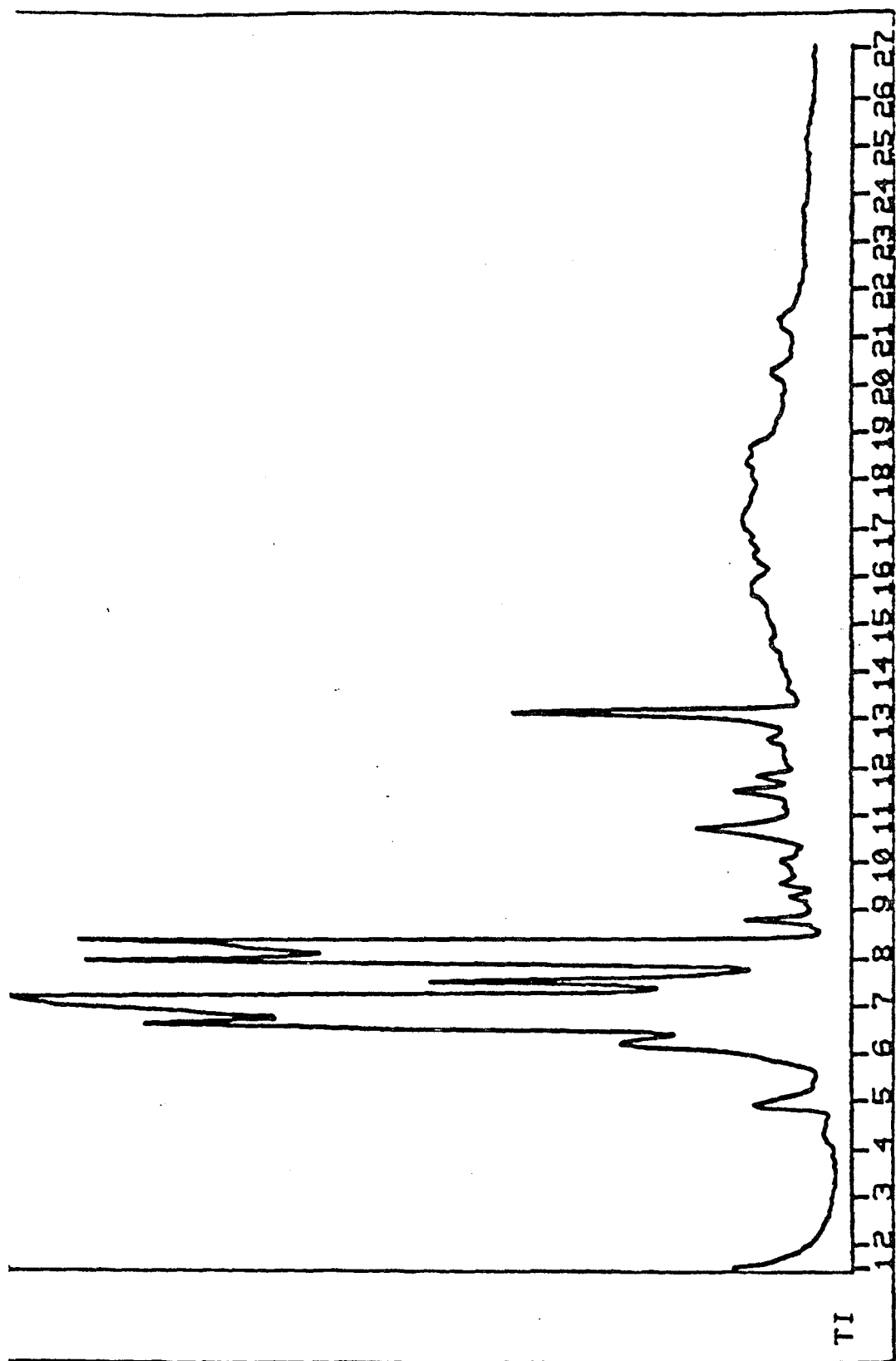


Figure 12c. Total ion current chromatogram by GC/MS of methylene chloride extract of aqueous phase in urethane sample for the determination of PAH-type compounds.

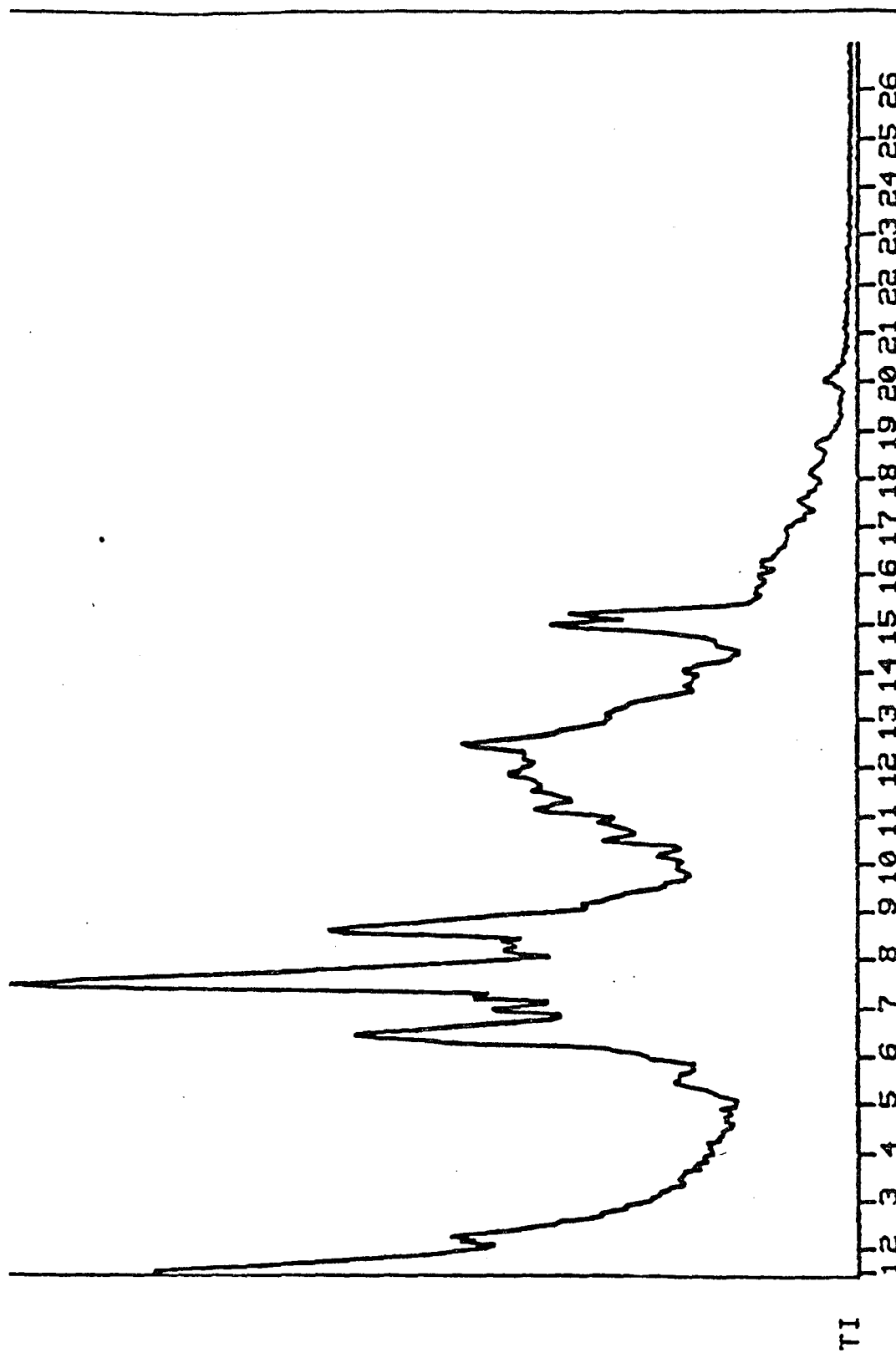


Figure 12d. Total ion current chromatogram by GC/MS of methylene chloride extract of aqueous phase in furan sample for the determination of PAH-type compounds.

TABLE 11
CONCENTRATIONS OF PAH AND RELATED COMPOUNDS
IN THE AQUEOUS PHASE (µg/g SAMPLE)

COMPOUND	FURAN	URETHANE	SHELL	GREEN SAND
ACRIDINE	13	25	<2	3.7
NAPHTHALENE	<2	<1	<2	<2
CARBAZOLE	<2	<1	<2	<2
PHENANTHRENE	<2	<1	230	8
BENZO(a)ANTHRACENE	<2	<1	<2	<2
CHRYSENE				
BENZO(a)PYRENE	<2	<1	<2	<2
DIBENZO(a,h)-ANTHRACENE	<2	<1	<2	<2

TABLE 12

SUMMARY: COMPONENTS OF EMISSIONS ($\mu\text{g/g}$ WHOLE SAMPLE)

COMPOUND	FURAN		URETHANE		SHELL		GREEN SAND	
	AQUEOUS	PARTICULATE	AQUEOUS	PARTICULATE	AQUEOUS	PARTICULATE	AQUEOUS	PARTICULATE
ACRIDINE	13	-	25	-	-	-	3.7	-
NAPHTHALENE	-	-	-	0.2	-	-	-	-
CARBAZOLE	-	-	-	-	-	-	-	-
PHENANTHRENE	-	3.4	-	4.6	230	720	8	1800
BENZO(a)ANTHRACENE	-	-	-	0.1	-	170	<2	280
CHRYSENE	-	-	-	-	-	-	-	-
BENZO(a)PYRENE	-	-	-	-	-	130	<2	58
DIBENZO(a,h)-ANTHRACENE	-	-	-	-	-	-	-	-

TABLE 13
CONCENTRATIONS OF PHENOLS IN AQUEOUS PHASE ($\mu\text{g/g}$ SAMPLE)

COMPOUND	FURAN	URETHANE	SHELL	GREEN SAND
PHENOL	2000	50000	1600	1000
PENTACHLOROPHENOL	3	<2	<2	<2
4-NITROPHENOL	48	420	1800	<2
2-NITROPHENOL	<2	<2	2300	<2
2,4-DIMETHYLPHENOL	<2	21	60	<2

TABLE 14A

CUMULATIVE MORTALITY

ACUTE RANGE-FINDING STUDY OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS

GREEN SAND

GROUP	SEX	DOSE LEVEL (mg/0.2 ml distilled water)	STUDY WEEK				
			1	2	3	4	5
1	M	2.5	0/10	1/10	1/10	1/10	1/10
2	M	5.0	0/10	0/10	0/10	0/10	0/10
3	M	10.0	0/10	0/10	0/10	0/10	0/10
4	M	20.0	0/10	2/10	2/10	2/10	2/10
9	M	Control	0/10	0/10	0/10	0/10	0/10
1	F	2.5	0/10	1/10	1/10	1/10	1/10
2	F	5.0	0/10	0/10	0/10	0/10	0/10
3	F	10.0	0/10	0/10	0/10	0/10	0/10
4	F	20.0	1/10	2/10	2/10	2/10	3/10
9	F	Control	0/10	0/10	0/10	0/10	0/10

TABLE 14B

CUMULATIVE MORTALITY

ACUTE RANGE-FINDING STUDY OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS

SHELL SAND

GROUP	SEX	DOSE LEVEL (mg/0.2 ml distilled water)	STUDY WEEK				
			1	2	3	4	5
5	M	2.5	0/10	0/10	0/10	0/10	0/10
6	M	5.0	0/10	0/10	0/10	0/10	0/10
7	M	10.0	1/10	1/10	1/10	1/10	1/10
8	M	20.0	4/10	9/10	9/10	9/10	9/10
9	M	Control	0/10	0/10	0/10	0/10	0/10
5	F	2.5	0/10	0/10	0/10	0/10	0/10
6	F	5.0	0/10	0/10	0/10	0/10	0/10
7	F	10.0	0/10	0/10	0/10	0/10	0/10
8	F	20.0	3/10	7/10	7/10	7/10	7/10
9	F	Control	0/10	0/10	0/10	0/10	0/10

TABLE 14C

CUMULATIVE MORTALITY

ACUTE RANGE-FINDING STUDY OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS

URETHANE

GROUP	SEX	DOSE LEVEL (mg/0.2 ml distilled water)	STUDY WEEK				
			1	2	3	4	5
10	M	2.5	1/10	2/10	2/10	2/10	2/10
11	M	5.0	0/10	0/10	0/10	0/10	0/10
12	M	10.0	2/10	2/10	2/10	2/10	2/10
13	M	20.0	9/10	10/10	10/10	10/10	10/10
18 ^a	M	Control	0/11	0/11	0/11	0/11	0/11
10	F	2.5	0/10	0/10	0/10	0/10	0/10
11	F	5.0	0/10	0/10	0/10	0/10	0/10
12	F	10.0	2/10	2/10	2/10	2/10	2/10
13	F	20.0	10/10	10/10	10/10	10/10	10/10
18 ^a	F	Control	0/9	0/9	0/9	0/9	0/9

^aGroup 18 consisted of 11 males and 9 females due to mis-sexed animal.

TABLE 14D

CUMULATIVE MORTALITY
ACUTE RANGE-FINDING STUDY OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS

FURAN

GROUP	SEX	DOSE LEVEL (mg/0.2 ml distilled water)	STUDY WEEK				
			1	2	3	4	5
14	M	2.5	0/10	0/10	0/10	0/10	0/10
15	M	5.0	0/10	0/10	0/10	0/10	0/10
16	M	10.0	0/10	0/10	0/10	0/10	0/10
17	M	20.0	7/10	7/10	9/10	9/10	9/10
18 ^a	M	Control	0/11	0/11	0/11	0/11	0/11
14	F	2.5	0/10	0/10	0/10	0/10	0/10
15	F	5.0	0/10	0/10	0/10	0/10	0/10
16	F	10.0	0/10	0/10	0/10	0/10	0/10
17	F	20.0	6/10	7/10	10/10	10/10	10/10
18 ^a	F	Control	0/9	0/9	0/9	0/9	0/9

^aGroup 18 consisted of 11 males and 9 females due to mis-sexed animal.

TABLE 15A
MEAN BODY WEIGHTS^a
ACUTE RANGE-FINDING STUDY OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS

GREEN SAND

GROUP	SEX	DOSE LEVEL (mg/0.2 ml distilled water)		BODY WEIGHT(g)					TERMINAL WEIGHT (g)
				STUDY WEEK					
				1	2	3	4	5	
1	M	2.5	MEAN	88	90	90	92	94	95
			S.D.	9	8	5	8	8	5
			N	10	10	9	9	9	9
2	M	5.0	MEAN	89	88	90	92	94	97
			S.D.	7	9	6	6	7	7
			N	10	10	10	10	10	10
3	M	10.0	MEAN	93	95	95	95	97	101
			S.D.	7	7	7	8	8	8
			N	10	10	10	10	10	10
4	M	20.0	MEAN	86	82	90	93	92	97
			S.D.	11	13	16	16	15	17
			N	10	10	8	8	8	8
9	M	Control	MEAN	81	81	83	86	89	93
			S.D.	10	9	8	6	7	7
			N	10	10	10	10	10	10
1	F	2.5	MEAN	88	92	94	93	100	104
			S.D.	8	11	12	9	14	15
			N	10	10	9	9	9	9
2	F	5.0	MEAN	93	93	95	97	98	100
			S.D.	17	22	17	18	17	20
			N	10	10	10	10	10	10
3	F	10.0	MEAN	98	97	97	100	102	107
			S.D.	10	16	14	13	13	12
			N	10	10	10	10	10	10
4	F	20.0	MEAN	91	89	90	96	97	103
			S.D.	8	9	8	9	8	9
			N	10	9	8	8	8	7
9	F	Control	MEAN	87	91	95	100	104	110
			S.D.	12	12	11	10	8	9
			N	10	10	10	10	10	10

^aBody weights were measured at the beginning of each week.

TABLE 15B
MEAN BODY WEIGHTS^a
ACUTE RANGE-FINDING STUDY OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS

SHELL SAND

GROUP	SEX	DOSE LEVEL (mg/0.2 ml distilled water)		BODY WEIGHT(g)					TERMINAL WEIGHT (g)
				STUDY WEEK					
				1	2	3	4	5	
5	M	2.5	MEAN	78	79	82	84	89	90
			S.D.	9	8	7	7	7	9
			N	10	10	10	10	10	10
6	M	5.0	MEAN	81	79	82	84	89	89
			S.D.	11	11	9	9	10	10
			N	10	10	10	10	10	10
7	M	10.0	MEAN	76	81	83	84	87	89
			S.D.	6	5	4	5	5	5
			N	10	9	9	9	9	9
8	M	20.0	MEAN	82	89	84	86	88	90
			S.D.	12	8	0	0	0	0
			N	10	6	1	1	1	1
9	M	Control	MEAN	81	81	83	86	89	93
			S.D.	10	9	8	6	7	7
			N	10	10	10	10	10	10
5	F	2.5	MEAN	92	94	99	103	106	108
			S.D.	6	6	7	9	9	9
			N	10	10	10	10	10	10
6	F	5.0	MEAN	90	91	94	97	102	104
			S.D.	14	13	13	17	17	19
			N	10	10	10	10	10	10
7	F	10.0	MEAN	91	94	97	99	104	107
			S.D.	7	10	12	12	12	13
			N	10	10	10	10	10	10
8	F	20.0	MEAN	95	93	97	98	102	104
			S.D.	8	6	6	6	8	5
			N	10	7	3	3	3	3
9	F	Control	MEAN	87	91	95	100	104	110
			S.D.	12	12	11	10	8	9
			N	10	10	10	10	10	10

^aBody weights were measured at the beginning of each week.

TABLE 15C
MEAN BODY WEIGHTS^a
ACUTE RANGE-FINDING STUDY OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS

URETHANE

GROUP	SEX	DOSE LEVEL (mg/0.2 ml distilled water)		BODY WEIGHT(g)					TERMINAL WEIGHT (g)
				STUDY WEEK					
				1	2	3	4	5	
10	M	2.5	MEAN	65	67	66	73	78	82
			S.D.	8	10	7	6	7	7
			N	10	9	8	8	8	8
11	M	5.0	MEAN	66	69	70	73	76	81
			S.D.	4	5	8	8	9	14
			N	10	10	10	10	10	10
12	M	10.0	MEAN	68	68	68	76	77	81
			S.D.	4	7	9	3	7	13
			N	10	8	8	8	8	8
13	M	20.0	MEAN	70	84	- ^c	- ^c	- ^c	- ^c
			S.D.	5	0	-	-	-	-
			N	10	1	-	-	-	-
18 ^b	M	Control	MEAN	69	74	75	80	83	80
			S.D.	7	7	9	8	9	16
			N	11	11	11	11	11	11
10	F	2.5	MEAN	70	72	76	79	86	92
			S.D.	5	7	8	11	10	13
			N	10	10	10	10	10	10
11	F	5.0	MEAN	66	70	77	83	88	97
			S.D.	8	13	9	9	11	13
			N	10	10	10	10	10	10
12	F	10.0	MEAN	73	76	79	86	89	96
			S.D.	4	8	12	9	11	11
			N	10	8	8	8	8	8
13	F	20.0	MEAN	62	- ^c	- ^c	- ^c	- ^c	- ^c
			S.D.	8	-	-	-	-	-
			N	10	-	-	-	-	-
18 ^b	F	Control	MEAN	68	63	78	83	88	82
			S.D.	5	12	8	9	11	19
			N	9	9	9	9	9	9

^aBody weights were measured at the beginning of each week.

^bGroup 18 consisted of 11 males and 9 females due to mis-sexed animal.

^cAll animals dead.

TABLE 15D
MEAN BODY WEIGHTS^a
ACUTE RANGE-FINDING STUDY OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS

FURAN									
GROUP	SEX	DOSE LEVEL (mg/0.2 ml distilled water)		BODY WEIGHT(g)					TERMINAL WEIGHT (g)
				STUDY WEEK					
				1	2	3	4	5	
14	M	2.5	MEAN	69	73	77	82	83	90
			S.D.	10	8	8	8	12	12
			N	10	10	10	10	10	10
15	M	5.0	MEAN	70	75	79	84	88	94 ^d
			S.D.	8	8	8	8	8	6
			N	10	10	10	10	10	9
16	M	10.0	MEAN	70	71	75	82	83	92
			S.D.	7	7	4	4	11	6
			N	10	10	10	10	10	10
17	M	20.0	MEAN	72	79	83	88	87	94
			S.D.	7	6	3	0	0	0
			N	10	3	3	1	1	1
18 ^b	M	Control	MEAN	69	74	75	80	83	80
			S.D.	7	7	9	8	9	16
			N	11	11	11	11	11	11
14	F	2.5	MEAN	75	83	89	95	101	108
			S.D.	6	6	8	8	9	12
			N	10	10	10	10	10	10
15	F	5.0	MEAN	71	79	86	91	90	105
			S.D.	8	9	11	11	17	14
			N	10	10	10	10	10	10
16	F	10.0	MEAN	70	71	78	83	89	97
			S.D.	7	7	8	9	9	11
			N	10	10	10	10	10	10
17	F	20.0	MEAN	70	68	83	- ^c	- ^c	- ^c
			S.D.	7	14	12	-	-	-
			N	10	4	3	-	-	-
18 ^b	F	Control	MEAN	68	63	78	83	88	82
			S.D.	5	12	8	9	11	19
			N	9	9	9	9	9	9

^aBody weights were measured at the beginning of each week.

^bGroup 18 consisted of 11 males and 9 females due to mis-sexed animal.

^cAll animals dead.

^dOne terminal body weight inadvertently not recorded.

TABLE 16
SUMMARY OF HISTOPATHOLOGIC FINDINGS^a
ACUTE RANGE-FINDING STUDY OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS

GREEN SAND

GROUP 1	<u>DOSE LEVEL:</u>	2.5 mg; <u>PATHOLOGY ON:</u> 1 Male, 1 Female.
	<u>LARYNX:</u>	No significant lesion recognized.
	<u>TRACHEA:</u>	No significant lesion recognized.
	<u>LUNG:</u>	Intraluminal alveolar pigment, minimal; focal histiocytosis, minimal (both animals).
GROUP 3	<u>DOSE LEVEL:</u>	10.0 mg; <u>PATHOLOGY ON:</u> 10 Males, 10 Females.
	<u>LARYNX:</u>	No significant lesion recognized.
	<u>TRACHEA:</u>	No significant lesion recognized.
	<u>LUNG:</u>	Intraluminal bronchiolar and alveolar pigment, slight; histiocytosis, focal, slight; alveolar bronchiolar hyperplasia, minimal (all animals).
GROUP 4	<u>DOSE LEVEL:</u>	20.0 mg; <u>PATHOLOGY ON:</u> 2 Males; 2 Females.
	<u>LARYNX:</u>	No significant lesion recognized.
	<u>TRACHEA:</u>	No significant lesion recognized.
	<u>LUNG:</u>	Intraluminal bronchiolar and alveolar pigment, slight; alveolar bronchiolar hyperplasia, moderate to marked; alveolar histiocytosis, minimal (all animals).

NOTE: No significant lesions were recognized in any other tissues from the Group 1, 3 and 4 animals that were examined.

SHELL SAND

GROUP 7	<u>DOSE LEVEL:</u>	10.0 mg; <u>PATHOLOGY ON:</u> 10 Males, 10 Females.
	<u>LARYNX:</u>	No significant lesion recognized.
	<u>TRACHEA:</u>	No significant lesion recognized.
	<u>LUNG:</u>	Intraluminal alveolar bronchiolar pigment, minimal to moderate; alveolar histiocytosis hyperplasia, minimal to moderate (all animals).

^aHistopathologic evaluations were performed on all animals that died or were sacrificed moribund during the study, all animals in the Group 9 control group, and all animals in the highest dose group (for each test article) with survivors at the time of study termination.

TABLE 16 (Continued)
SUMMARY OF HISTOPATHOLOGIC FINDINGS^a
ACUTE RANGE-FINDING STUDY OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS

SHELL SAND (Continued)

GROUP 8	<u>DOSE LEVEL:</u> 20.0 mg; <u>PATHOLOGY ON:</u> 10 Males, 10 Females. <u>LARYNX:</u> No significant lesion recognized. <u>TRACHEA:</u> No significant lesion recognized. <u>LUNG:</u> Adenomatous hyperplasia associated with the presence of pigment; congestion, acute, moderate; pneumonitis, minimal; bronchiolar pneumonia; diffuse dust deposits throughout the lung (all animals). <u>SPLEEN:</u> Peritonitis, acute and chronic diffuse, minimal (1 female). <u>LIVER:</u> Hepatitis, granulomatous, multifocal, slight (1 female).
---------	---

NOTE: No significant lesions were recognized in any other tissues from animals in Group 7 and 8.

URETHANE

GROUP 10	<u>DOSE LEVEL:</u> 2.5 mg; <u>PATHOLOGY ON:</u> 2 Males. <u>LARYNX:</u> No significant lesion recognized. <u>TRACHEA:</u> No significant lesion recognized. <u>LUNG:</u> Minimal alveolar bronchiolar hyperplasia associated with pigment (both animals).
GROUP 11	<u>DOSE LEVEL:</u> 5.0 mg; <u>PATHOLOGY ON:</u> 10 Males, 10 Females. <u>LARYNX:</u> No significant lesion recognized. <u>TRACHEA:</u> No significant lesion recognized. <u>LUNG:</u> Intraluminal bronchiolar alveolar pigment, minimal; alveolar bronchiolar hyperplasia, minimal; histiocytosis focal, minimal (all animals).
GROUP 12	<u>DOSE LEVEL:</u> 10.0 mg; <u>PATHOLOGY ON:</u> 2 Males, 2 Females. <u>LARYNX:</u> No significant lesion recognized. <u>TRACHEA:</u> No significant lesion recognized. <u>LUNG:</u> Alveolar bronchiolar hyperplasia, focal, minimal; fibrinopurulent pneumonia, multifocal, associated with aspiration of pigment, slight (all animals).

^aHistopathologic evaluations were performed on all animals that died or were sacrificed moribund during the study, all animals in the Group 9 control group, and all animals in the highest dose group (for each test article) with survivors at the time of study termination.

TABLE 16 (Continued)
SUMMARY OF HISTOPATHOLOGIC FINDINGS^a
ACUTE RANGE-FINDING STUDY OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS

URETHANE (Continued)

GROUP 13	<u>DOSE LEVEL:</u>	20.0 mg; <u>PATHOLOGY ON:</u> 10 Males, 10 Females.
	<u>LARYNX:</u>	No significant lesion recognized.
	<u>TRACHEA:</u>	No significant lesion recognized.
	<u>LUNG:</u>	Intraluminal bronchiolar pigment, minimal to moderate; alveolar bronchiolar hyperplasia, focal, minimal; fibrinopurulent pneumonia, multifocal associated with aspiration of pigment, slight (all animals).

NOTE: No significant lesions were recognized in any other tissues from animals in Groups 10, 11, 12 and 13.

FURAN

GROUP 16	<u>DOSE LEVEL:</u>	10.0 mg; <u>PATHOLOGY ON:</u> 10 Males, 10 Females.
	<u>LARYNX:</u>	No significant lesion recognized.
	<u>TRACHEA:</u>	No significant lesion recognized.
	<u>LUNG:</u>	Intraluminal bronchiolar and alveolar pigment, minimal; alveolar bronchiolar hyperplasia, minimal, focal (all animals).

GROUP 17	<u>DOSE LEVEL:</u>	20.0 mg; <u>PATHOLOGY ON:</u> 9 Males, 10 Females.
	<u>LARYNX:</u>	No significant lesion recognized.
	<u>TRACHEA:</u>	No significant lesion recognized.
	<u>LUNG:</u>	Intraluminal bronchiolar and alveolar pigment, minimal to moderate; alveolar bronchiolar hyperplasia, minimal; fibrinopurulent necrotizing pneumonia, moderate, diffuse (all animals).

NOTE: No significant lesion recognized in any other tissues from animals in Group 16 and 17.

CONTROL

GROUP 9	<u>DOSE LEVEL:</u>	0.2 ml distilled water; <u>PATHOLOGY ON:</u> 10 Males, 10 Females.
---------	--------------------	--

No significant lesions were recognized in any tissues, including the respiratory system, from all animals in Group 9.

^aHistopathologic evaluations were performed on all animals that died or were sacrificed moribund during the study, all animals in the Group 9 control group, and all animals in the highest dose group (for each test article) with survivors at the time of study termination.

TABLE 17A
CUMULATIVE MORTALITY - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS
MALES

GROUP	TREATMENT	DOSE LEVEL (mg/0.2 ml)	NUMBER ON STUDY ^a	NUMBER DEAD																			
				STUDY WEEK																			
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Vehicle Control	-	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2	Ferric Oxide + Vehicle Control	3.0	50	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	2	2	2	2	
3	B(a)P + Ferric Oxide	3.0 + 3.0	48	0	0	0	0	0	0	0	0	0	1	1	2	3	3	4	4	4	4	4	
4	Shell	5.0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	Shell	10.0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	3	3	3	
6	Green Sand	5.0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	Green Sand	10.0	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8	Furan	5.0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	Furan	10.0	49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10	Urethane	2.5	50	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	
11	Urethane	5.0	49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

^aEscaped and mis-sexed animals, and those whose tissue were inadvertently lost during processing were eliminated from the study; therefore, the number on study deviates from design for some groups.

TABLE 17A (Continued)
CUMULATIVE MORTALITY - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS
MALES

GROUP	TREATMENT	DOSE LEVEL (mg/0.2 ml)	NUMBER ON STUDY ^a	NUMBER DEAD																				
				STUDY WEEK																				
				21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
1	Vehicle Control	-	48	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	3
2	Ferric Oxide + Vehicle Control	3.0	50	2	2	2	3	3	3	3	4	4	4	4	4	4	4	6	6	6	6	6	6	6
3	B(a)P + Ferric Oxide	3.0 + 3.0	48	4	5	5	5	5	6	7	10	10	11	11	11	11	13	13	14	17	18	19	19	19
4	Shell	5.0	50	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2
5	Shell	10.0	50	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5	5	5	5
6	Green Sand	5.0	50	0	0	0	0	0	0	1	1	1	2	2	2	2	3	4	4	4	4	4	5	6
7	Green Sand	10.0	48	0	0	0	0	0	0	0	0	0	1	1	3	3	3	3	4	4	4	4	4	5
8	Furan	5.0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
9	Furan	10.0	49	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	3
10	Urethane	2.5	50	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	3	3	5	5	5	6
11	Urethane	5.0	49	0	0	0	0	0	0	0	0	3	3	3	3	3	3	3	3	3	4	4	4	4

^aEscaped and mis-sexed animals, and those whose tissue were inadvertently lost during processing were eliminated from the study; therefore, the number on study deviates from design for some groups.

TABLE 17A (Continued)
CUMULATIVE MORTALITY - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS
MALES

GROUP	TREATMENT	DOSE LEVEL (mg/0.2 ml)	NUMBER ON STUDY ^a	NUMBER DEAD STUDY WEEK																			
				41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
1	Vehicle Control	-	48	3	3	4	4	4	4	4	4	4	5	5	7	8	11	11	12	12	12	12	13
2	Ferric Oxide + Vehicle Control	3.0	50	6	6	6	6	6	6	6	6	6	6	6	7	7	7	7	7	7	7	7	7
3	B(a)p + Ferric Oxide	3.0 + 3.0	48	21	24	24	25	26	27	27	30	31	31	31	31	31	31	34	35	35	36	36	38
4	Shell	5.0	50	3	3	3	3	3	4	4	4	4	5	5	5	5	5	5	5	5	5	6	8
5	Shell	10.0	50	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	7
6	Green Sand	5.0	50	6	7	7	7	7	7	9	9	9	9	10	10	10	10	10	10	10	10	10	10
7	Green Sand	10.0	48	5	5	5	6	6	6	7	7	7	7	7	7	7	7	7	8	8	8	9	
8	Furan	5.0	50	2	2	2	2	3	4	4	5	5	5	6	6	7	7	9	9	9	10	11	
9	Furan	10.0	49	3	3	3	3	3	3	3	3	3	3	3	3	5	5	5	5	5	5	6	
10	Urethane	2.5	50	6	6	7	7	7	7	8	8	9	10	10	10	10	10	10	10	10	10	11	
11	Urethane	5.0	49	4	4	4	5	5	5	6	7	7	7	7	8	8	9	9	10	10	11	12	

^aEscaped and mis-sexed animals, and those whose tissue were inadvertently lost during processing were eliminated from the study; therefore, the number on study deviates from design for some groups.

TABLE 17A (Continued)
CUMULATIVE MORTALITY - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS
MALES

GROUP	TREATMENT	DOSE LEVEL (mg/0.2 ml)	NUMBER ON STUDY ^a	NUMBER DEAD																			
				STUDY WEEK																			
				61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
1	Vehicle Control	-	48	15	15	15	15	16	18	18	19	19	19	19	19	20	20	20	20	22	22	22	24
2	Ferric Oxide + Vehicle Control	3.0	50	9	9	10	11	11	11	11	11	12	12	14	14	15	15	16	16	16	17	18	19
3	B(a)P + Ferric Oxide	3.0 + 3.0	48	38	39	39	40	41	42	42	43	43	43	44	45	45	45	45	46	47	47	47	48
4	Shell	5.0	50	9	10	11	11	12	12	12	12	12	12	12	13	14	15	17	17	17	17	19	19
5	Shell	10.0	50	10	10	10	10	10	11	12	12	13	15	18	19	19	19	20	21	21	21	22	22
6	Green Sand	5.0	50	11	13	13	13	13	15	16	19	19	21	21	22	23	23	23	24	24	25	26	26
7	Green Sand	10.0	48	10	13	13	14	14	14	14	15	17	18	18	18	20	20	21	22	23	23	23	24
8	Furan	5.0	50	13	13	13	14	14	14	14	14	15	15	15	15	15	15	17	18	18	18	21	21
9	Furan	10.0	49	7	7	8	8	9	10	11	13	14	14	15	16	18	19	21	21	23	25	26	27
10	Urethane	2.5	50	14	15	15	15	15	15	15	15	16	17	18	20	20	20	24	24	24	24	24	24
11	Urethane	5.0	49	12	12	13	16	17	17	17	18	19	19	20	20	20	20	22	22	22	24	24	24

^aEscaped and mis-sexed animals, and those whose tissue were inadvertently lost during processing were eliminated from the study; therefore, the number on study deviates from design for some groups.

TABLE 17A (Continued)
CUMULATIVE MORTALITY - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS
MALES

GROUP	TREATMENT	DOSE LEVEL (mg/0.2 ml)	NUMBER ON STUDY ^a	NUMBER DEAD STUDY WEEK																			
				81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	Vehicle Control	-	48	25	29	29	29	29	30	30	33	34	34	34	34	34	36	38	40	41	41	41	41
2	Ferric Oxide + Vehicle Control	3.0	50	20	20	20	20	20	21	26	28	29	30	31	32	33	34	37	37	38	38	39	39
3	B(a)P + Ferric Oxide	3.0 + 3.0	48	- ^b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Shell	5.0	50	19	20	20	21	21	21	25	25	25	28	28	28	28	30	31	31	32	34	34	34
5	Shell	10.0	50	22	22	23	23	25	26	29	30	30	30	30	31	32	33	37	37	38	38	38	38
6	Green Sand	5.0	50	28	28	28	28	28	29	29	29	30	30	30	31	32	35	36	37	38	38	38	38
7	Green Sand	10.0	48	24	24	24	25	26	27	27	27	28	28	29	29	30	34	34	34	36	36	36	36
8	Furan	5.0	50	21	21	22	23	23	23	24	27	27	28	31	33	34	34	34	35	35	35	35	36
9	Furan	10.0	49	28	28	28	28	29	29	31	31	31	31	31	32	32	34	38	38	38	38	38	38
10	Urethane	2.5	50	24	25	25	27	27	28	28	28	30	30	30	31	32	32	36	39	39	39	40	40
11	Urethane	5.0	49	24	25	25	25	25	26	26	26	26	26	27	30	31	31	33	35	36	36	36	36

^aEscaped and mis-sexed animals, and those whose tissue were inadvertently lost during processing were eliminated from the study; therefore, the number on study deviates from design for some groups.

^bAll Group 3 males were dead.

TABLE 17A (Continued)
CUMULATIVE MORTALITY - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS
MALES

GROUP	TREATMENT	DOSE LEVEL (mg/0.2 ml)	NUMBER ON STUDY ^a	NUMBER DEAD																
				STUDY WEEK																
				101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117 ^c
1	Vehicle Control	-	48	41	41	41	41	43	43	43	43	43	43	44	45	45	45	45	45	45
2	Ferric Oxide + Vehicle Control	3.0	50	40	40	41	41	42	42	42	42	42	42	43	44	44	44	44	44	44
3	B(a)p + Ferric Oxide	3.0 + 3.0	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Shell	5.0	50	34	34	34	34	34	34	34	35	35	36	38	39	41	42	43	43	44
5	Shell	10.0	50	40	41	41	42	43	43	43	43	43	43	43	43	43	43	43	43	43
6	Green Sand	5.0	50	38	38	38	39	39	39	39	39	39	39	40	41	41	44	44	44	44
7	Green Sand	10.0	48	36	36	37	38	38	38	41	42	43	43	43	43	43	43	44	44	44
8	Furan	5.0	50	37	37	37	37	39	39	39	39	40	40	40	40	40	40	42	42	42
9	Furan	10.0	49	40	40	41	41	41	42	44	44	46	47	47	47	47	47	47	48	48
10	Urethane	2.5	50	40	41	42	42	42	42	42	43	44	44	45	45	45	45	45	46	46
11	Urethane	5.0	48	36	36	36	36	36	37	40	40	41	43	43	44	44	44	44	44	44

^aEscaped and mis-sexed animals, and those whose tissue were inadvertently lost during processing were eliminated from the study; therefore, the number on study deviates from design for some groups.

^cAll remaining males were sacrificed during Week 117.

TABLE 17B
CUMULATIVE MORTALITY - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS
FEMALES

GROUP	TREATMENT	DOSE LEVEL (mg/0.2 ml)	NUMBER ON STUDY ^a	NUMBER DEAD																				
				STUDY WEEK																				
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1	Vehicle Control	-	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	Ferric Oxide + Vehicle Control	3.0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	B(a)P + Ferric Oxide	3.0 + 3.0	50	0	0	0	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	3
4	Shell	5.0	49	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2	2	2	2
5	Shell	10.0	50	0	0	0	0	0	0	0	0	0	3	3	3	3	3	3	6	7	7	7	7	8
6	Green Sand	10.0	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	Green Sand	10.0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
8	Furan	5.0	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	Furan	10.0	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Urethane	2.5	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
11	Urethane	5.0	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1

^aEscaped and mis-sexed animals, and those whose tissue were inadvertently lost during processing were eliminated from the study; therefore, the number on study deviates from design for some groups.

TABLE 17B (Continued)
CUMULATIVE MORTALITY - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS
FEMALES

GROUP	TREATMENT	DOSE LEVEL (mg/0.2 ml)	NUMBER ON STUDY ^a	NUMBER DEAD																			
				STUDY WEEK																			
				21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	Vehicle Control	-	48	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	2	2	2	2
2	Ferric Oxide + Vehicle Control	3.0	50	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3
3	B(a)P + Ferric Oxide	3.0 + 3.0	50	3	3	3	4	4	6	6	6	7	8	8	8	9	10	10	10	12	13	13	15
4	Shell	5.0	49	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
5	Shell	10.0	50	8	8	8	8	8	8	8	8	8	9	9	10	10	10	10	10	12	13	13	13
6	Green Sand	5.0	48	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2
7	Green Sand	10.0	50	1	1	1	1	1	1	1	1	1	1	2	2	2	2	3	4	4	5	5	5
8	Furan	5.0	48	0	0	0	0	0	0	0	0	1	1	1	1	1	2	3	3	3	4	5	5
9	Furan	10.0	47	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	2	2	2	2	2
10	Urethane	2.5	47	1	1	1	1	2	2	2	2	2	2	2	2	4	4	4	4	4	5	6	6
11	Urethane	5.0	46	1	1	1	1	1	1	1	1	2	3	3	3	3	3	4	4	5	6	6	7

^aEscaped and mis-sexed animals, and those whose tissue were inadvertently lost during processing were eliminated from the study; therefore, the number on study deviates from design for some groups.

TABLE 17B (Continued)
CUMULATIVE MORTALITY - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS
FEMALES

GROUP	TREATMENT	DOSE LEVEL (mg/0.2 ml)	NUMBER ON STUDY ^a	NUMBER DEAD																			
				STUDY WEEK																			
				41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
1	Vehicle Control	-	48	3	3	3	3	3	3	4	4	4	5	5	5	5	6	6	7	7	7	7	9
2	Ferric Oxide + Vehicle Control	3.0	50	3	3	3	3	3	5	5	5	6	7	8	10	11	12	12	13	14	14	14	14
3	B(a)P + Ferric Oxide	3.0 + 3.0	50	17	17	18	18	19	19	20	20	20	21	22	24	25	25	27	27	28	30	30	30
4	Shell	5.0	49	3	3	3	5	5	5	5	5	5	6	7	7	7	7	7	7	7	8	10	11
5	Shell	10.0	50	13	13	13	14	15	16	16	16	16	16	16	16	16	17	17	17	17	17	17	18
6	Green Sand	5.0	48	3	3	3	4	4	4	4	5	5	5	5	6	6	7	7	7	7	7	7	8
7	Green Sand	10.0	50	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	7	8	8
8	Furan	5.0	48	5	5	6	6	6	6	6	6	6	7	8	8	9	9	10	12	12	12	12	13
9	Furan	10.0	47	2	2	3	3	3	4	4	5	5	6	6	7	7	8	9	10	10	10	10	11
10	Urethane	2.5	47	6	6	6	6	6	7	7	8	8	8	8	9	9	10	10	10	10	10	10	10
11	Urethane	5.0	46	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	8

^aEscaped and mis-sexed animals, and those whose tissue were inadvertently lost during processing were eliminated from the study; therefore, the number on study deviates from design for some groups.

TABLE 178 (Continued)
CUMULATIVE MORTALITY - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS
FEMALES

GROUP	TREATMENT	DOSE LEVEL (mg/0.2 ml)	NUMBER ON STUDY ^a	NUMBER DEAD																				
				STUDY WEEK																				
				61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	
1	Vehicle Control	-	48	12	13	14	14	15	16	17	17	17	17	17	19	21	22	23	27	29	31	32	34	35
2	Ferric Oxide + Vehicle Control	3.0	50	15	16	18	19	19	19	19	23	24	25	26	29	29	29	29	29	29	29	30	30	30
3	B(a)P + Ferric Oxide	3.0 + 3.0	50	32	34	34	34	34	36	38	39	40	41	42	42	42	43	43	43	43	43	44	44	45
4	Shell	5.0	49	12	13	13	13	13	16	21	22	22	24	25	25	25	25	25	25	25	26	26	28	30
5	Shell	10.0	50	21	23	23	23	23	23	23	23	24	24	24	25	26	27	27	27	27	29	32	33	33
6	Green Sand	5.0	48	10	12	13	13	14	16	17	18	18	19	21	21	23	23	26	27	27	27	30	31	32
7	Green Sand	10.0	50	9	11	12	14	15	16	16	18	18	18	19	20	24	25	27	27	27	27	30	31	32
8	Furan	5.0	48	16	18	18	19	20	21	21	21	22	23	23	25	26	26	26	28	29	29	31	31	31
9	Furan	10.0	47	11	14	16	18	20	20	22	22	26	27	27	29	29	32	33	34	34	34	35	36	36
10	Urethane	2.5	47	10	11	12	15	15	16	16	18	19	21	22	23	25	26	29	29	30	31	32	32	32
11	Urethane	5.0	46	8	11	14	16	18	21	22	23	26	27	29	29	31	32	34	34	35	36	37	38	38

^aEscaped and mis-sexed animals, and those whose tissue were inadvertently lost during processing were eliminated from the study; therefore, the number on study deviates from design for some groups.

TABLE 17B (Continued)
CUMULATIVE MORTALITY - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS
FEMALES

GROUP	TREATMENT	DOSE LEVEL (mg/0.2 ml)	NUMBER ON STUDY ^a	NUMBER DEAD																			
				STUDY WEEK																			
				81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	Vehicle Control	-	48	36	36	37	37	39	40	40	41	41	42	42	43	44	45	46	46	46	46	46	46
2	Ferric Oxide + Vehicle Control	3.0	50	32	33	35	37	39	39	39	39	39	39	39	41	42	45	45	45	45	45	45	45
3	8(a)P + Ferric Oxide	3.0 + 3.0	50	45	47	47	47	47	49	49	49	49	49	50	- ^b	-	-	-	-	-	-	-	-
4	Shell	5.0	49	31	31	31	32	33	33	33	37	37	37	37	37	38	39	39	39	39	40	40	40
5	Shell	10.0	50	34	34	34	35	36	36	38	38	38	39	39	40	41	42	43	43	45	45	45	45
6	Green Sand	5.0	48	34	36	38	38	38	39	41	41	41	43	43	43	44	44	44	45	45	45	45	45
7	Green Sand	10.0	50	32	32	35	37	37	38	38	39	40	40	40	40	41	41	41	41	41	42	43	44
8	Furan	5.0	48	31	31	31	32	32	32	33	35	38	38	39	40	40	40	40	43	44	44	44	45
9	Furan	10.0	47	37	38	39	39	39	39	39	39	39	39	39	39	42	42	42	42	43	45	45	45
10	Urethane	2.5	47	32	34	34	34	36	37	37	37	39	39	39	41	43	43	44	44	45	45	45	46
11	Urethane	5.0	46	38	39	40	40	41	42	43	43	43	43	43	44	44	44	44	44	44	44	44	44

^aEscaped and mis-sexed animals, and those whose tissue were inadvertently lost during processing were eliminated from the study; therefore, the number on study deviates from design for some groups.

^bAll Group 3 females were dead.

TABLE 17B (Continued)
 CUMULATIVE MORTALITY - CHRONIC STUDY
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS
 FROM IRON FOUNDRY CASTING OPERATIONS
 FEMALES

GROUP	TREATMENT	DOSE LEVEL (mg/0.2 ml)	NUMBER ON STUDY ^a	NUMBER DEAD STUDY WEEK		
				101	102	103 ^c
1	Vehicle Control	-	48	46	46	46
2	Ferric Oxide + Vehicle Control	3.0	50	45	46	46
3	B(a)P + Ferric Oxide	3.0 + 3.0	50	-	-	-
4	Shell	5.0	49	40	40	40
5	Shell	10.0	50	45	46	46
6	Green Sand	5.0	48	45	45	45
7	Green Sand	10.0	50	45	46	47
8	Furan	5.0	48	45	46	46
9	Furan	10.0	47	45	46	46
10	Urethane	2.5	47	46	46	46
11	Urethane	5.0	46	44	44	44

^aEscaped and mis-sexed animals, and those whose tissue were inadvertently lost during processing were eliminated from the study; therefore, the number on study deviates from design for some groups.

^cAll remaining females were sacrificed during Weeks 103.

FIGURE 13A
SURVIVAL
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUP 1 MALES vs GROUP 2 MALES

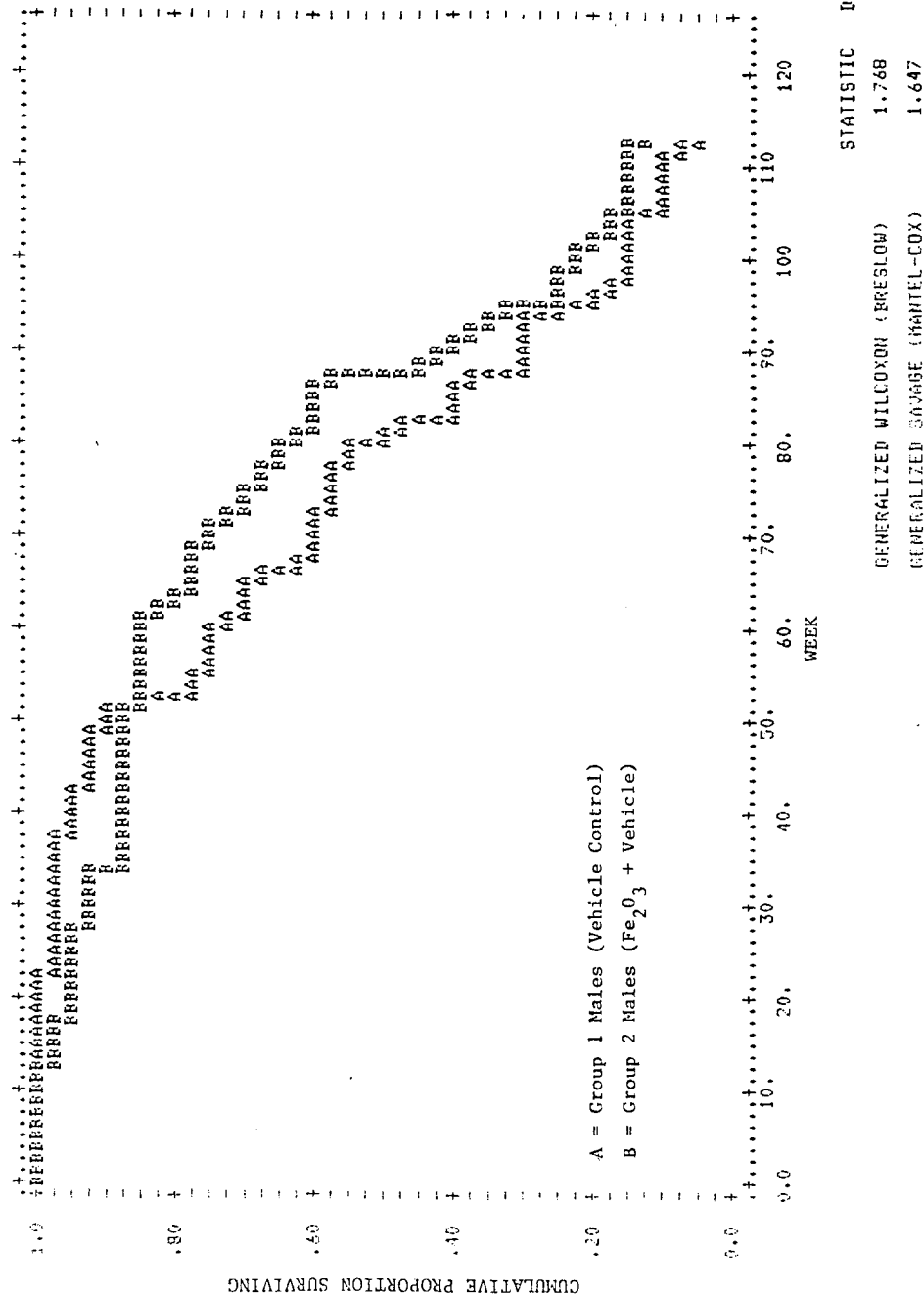
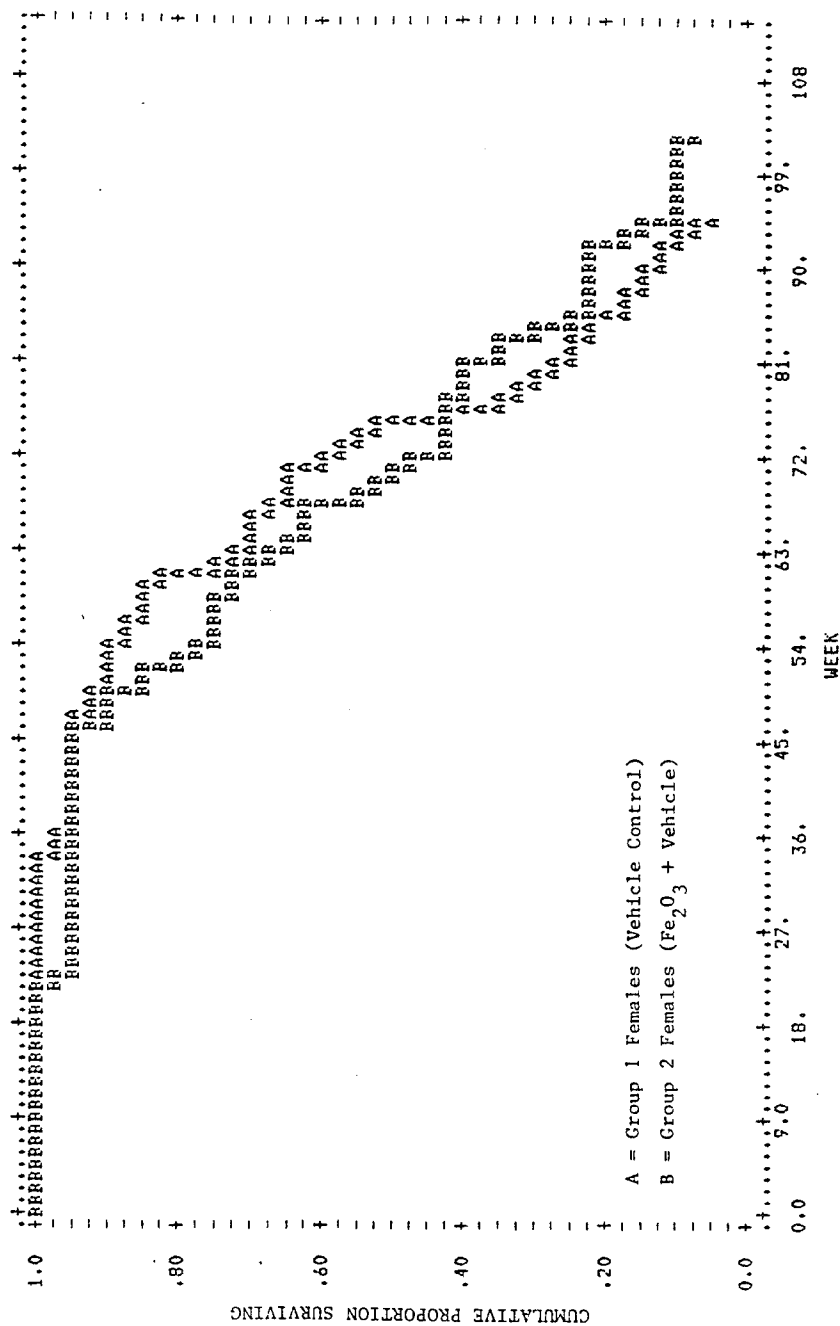


FIGURE 13A (Continued)

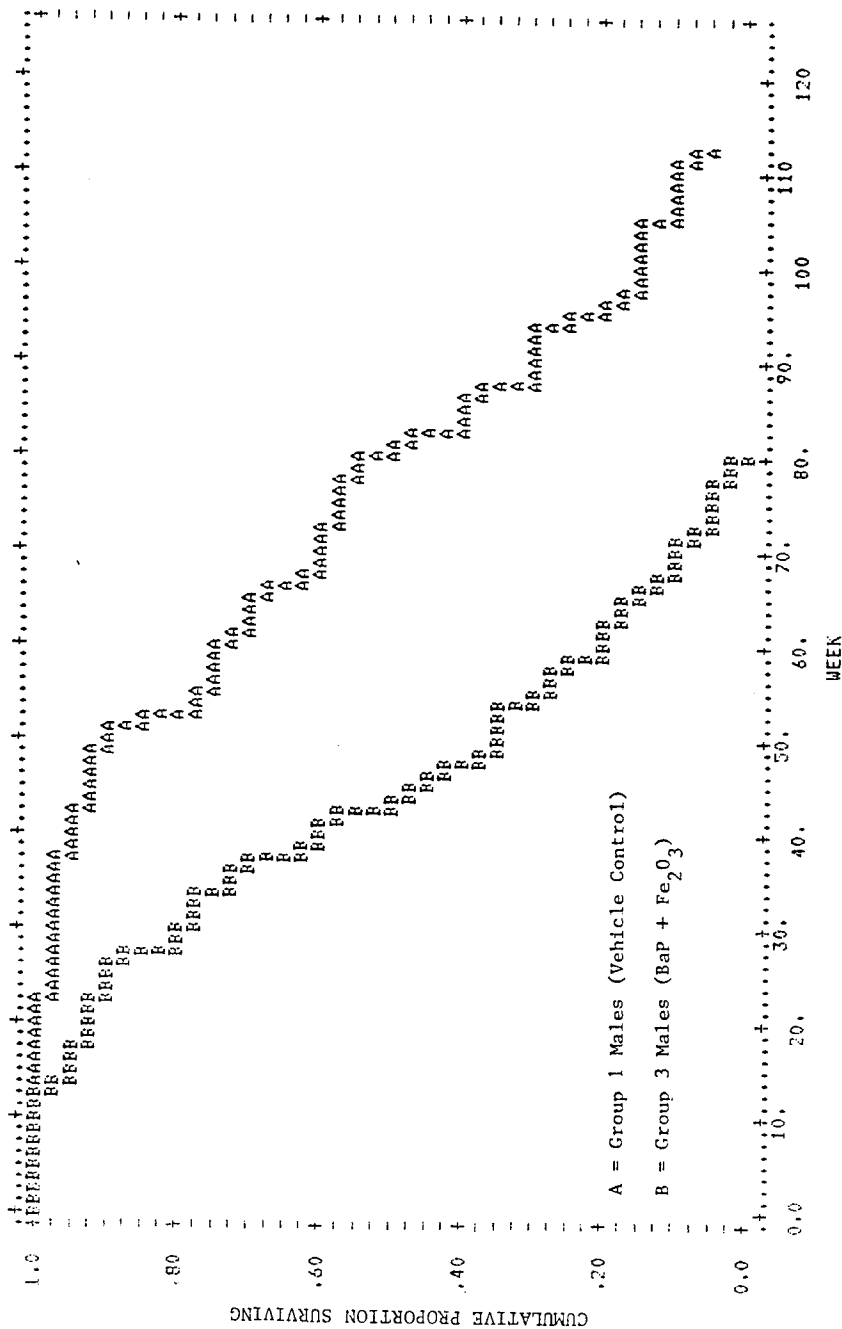
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
SURVIVAL
GROUP 1 FEMALES vs GROUP 2 FEMALES



	STATISTIC	D.F.	F-VALUE
GENERALIZED WILCOXON (BRESLOW)	0.093	1	0.7600
GENERALIZED SAVAGE (MANTEL-COX)	0.230	1	0.6312

FIGURE 13A (Continued)

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUP 1 MALES vs GROUP 3 MALES

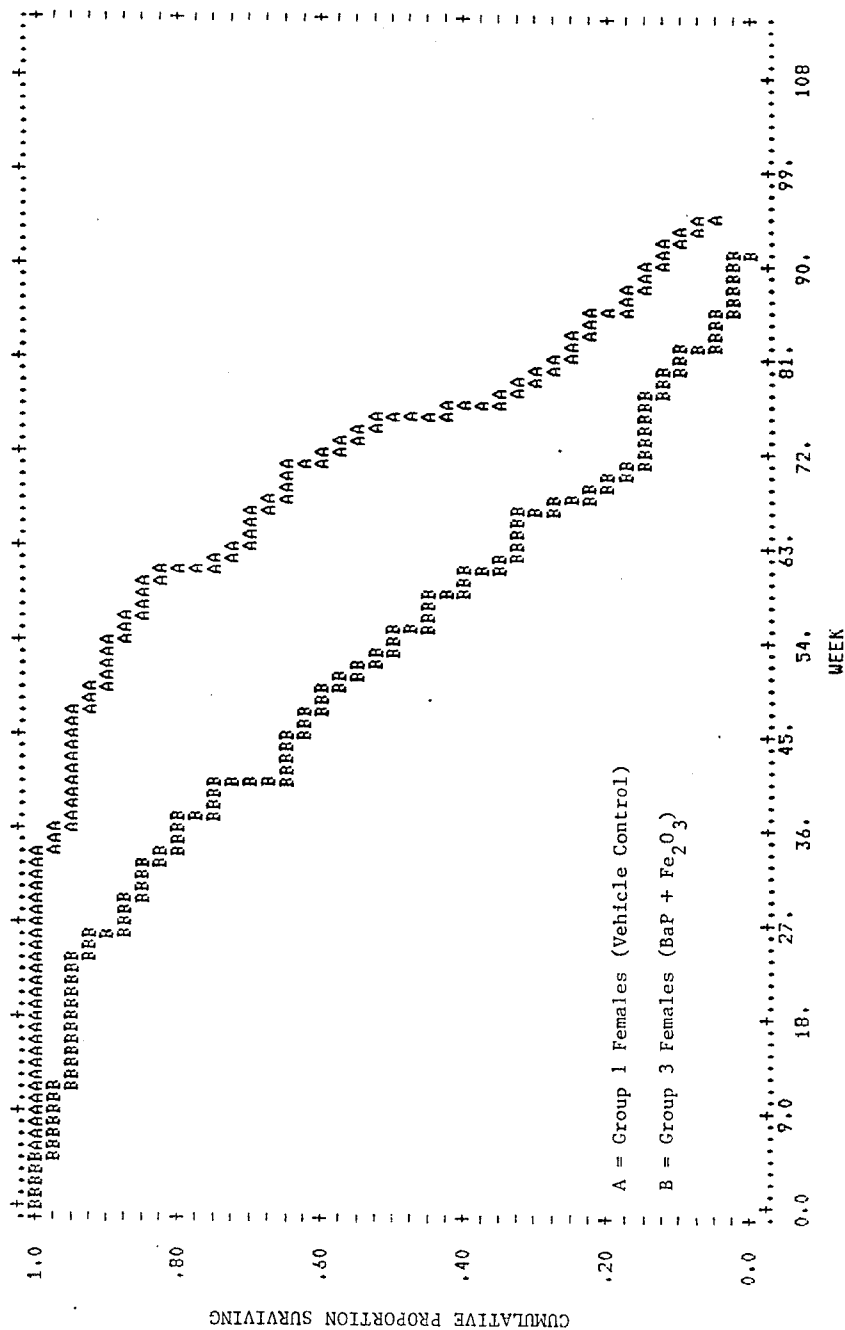


STATISTIC	D.F.	P-VALUE
GENERALIZED WILCOXON (BRESLOW)	1	0.0000
GENERALIZED SAVAGE (MANTEL-COX)	1	0.0000

Reproduced from
best available copy.

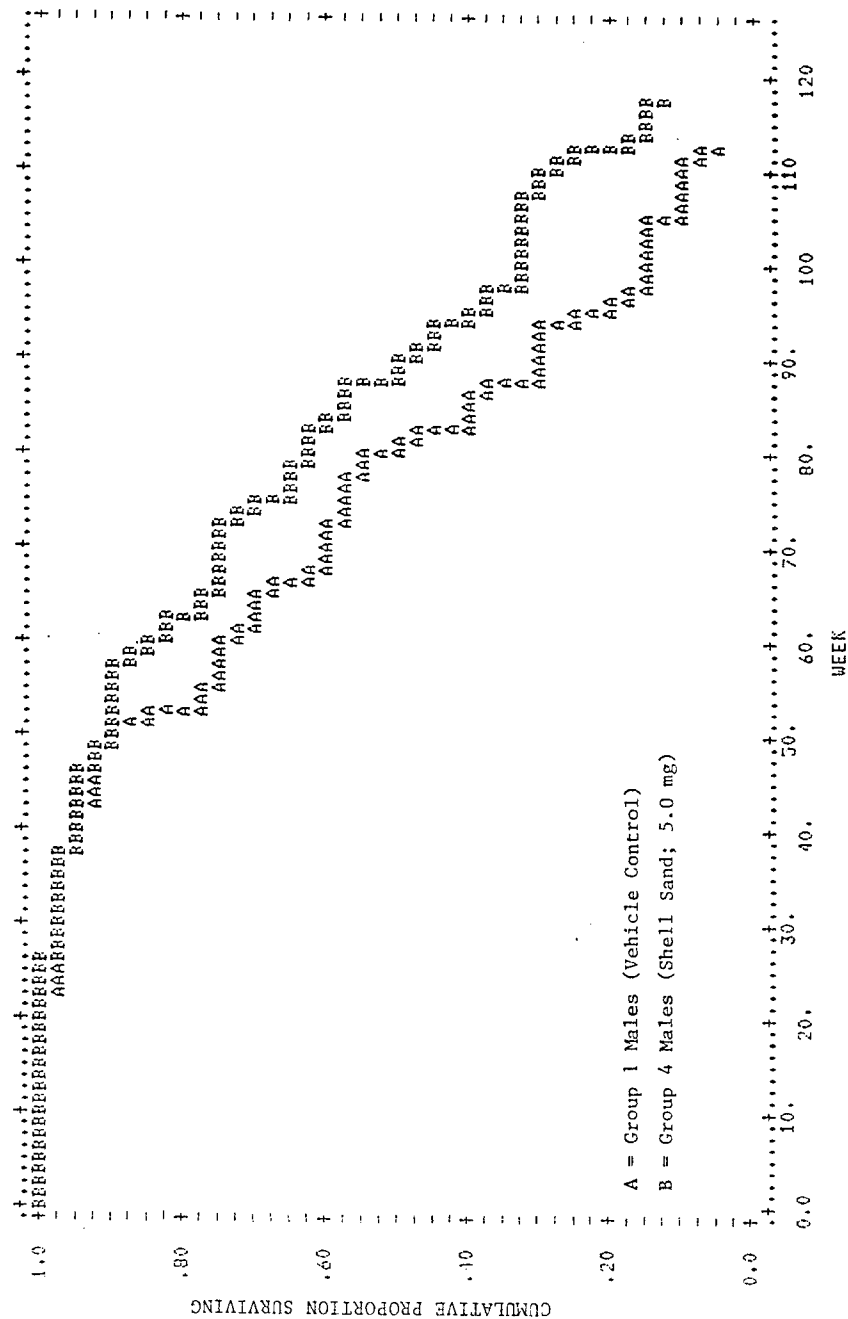
FIGURE 13A (Continued)

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
 GROUP 1 FEMALES vs GROUP 3 FEMALES



	STATISTIC	D.F.	P-VALUE
GENERALIZED WILCOXON (BRESLOW)	23.034	1	0.0000
GENERALIZED SAVAGE (MANTEL-COX)	19.693	1	0.0000

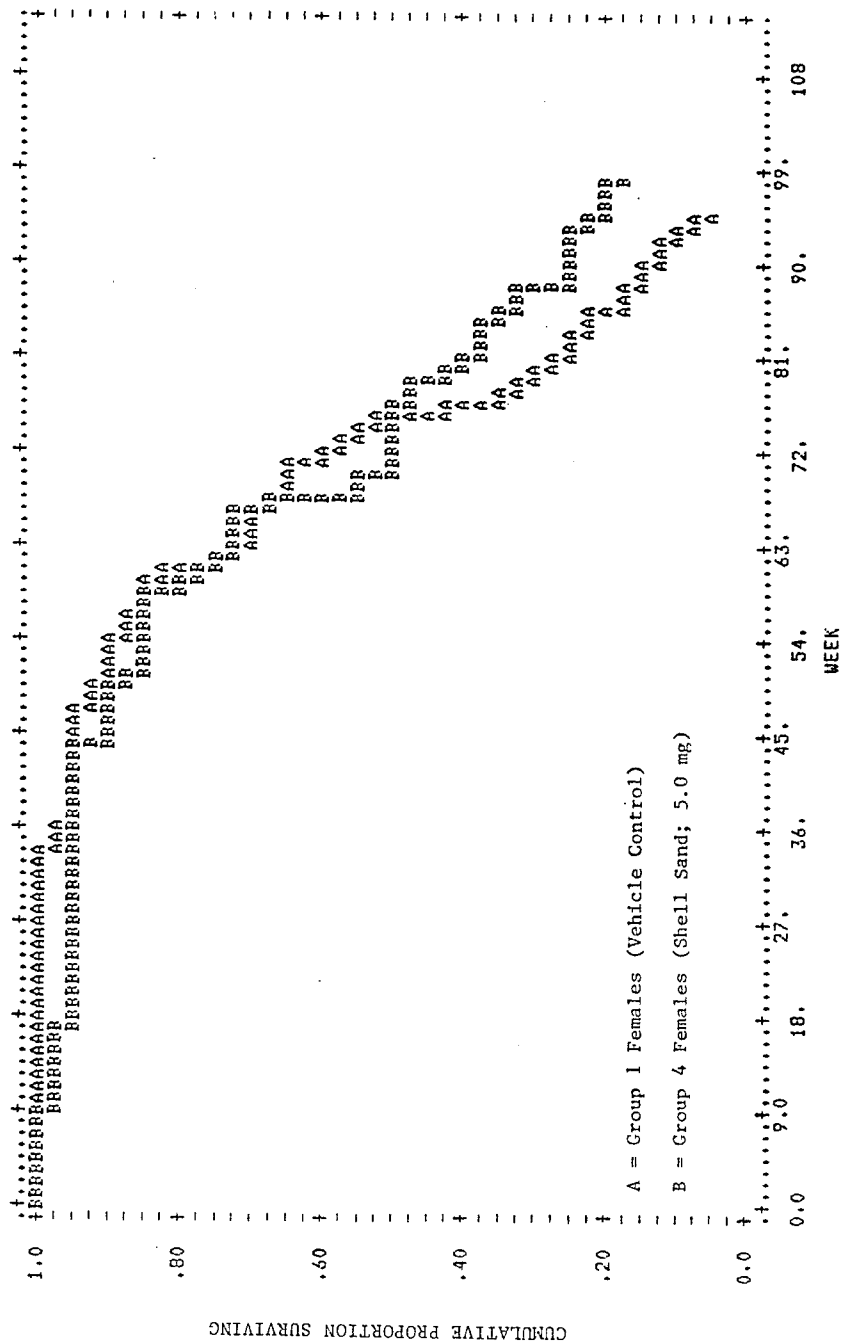
FIGURE 13A (Continued)
SURVIVAL
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUP 1 MALES vs GROUP 4 MALES



STATISTIC	D.F.	F-VALUE
GENERALIZED WILCOXON (BRESLOW)	1	0.0461
GENERALIZED SAVAGE (MANTEL-COX)	1	0.0382

Reproduced from
best available copy.

FIGURE 13A (Continued)
 SURVIVAL
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
 GROUP 1 FEMALES vs GROUP 4 FEMALES



	STATISTIC	D.F.	P-VALUE
GENERALIZED WILCOXON (BRESLOW)	0.368	1	0.5439
GENERALIZED SAVAGE (MANTEL-COX)	2.540	1	0.1110

FIGURE 13A (Continued)

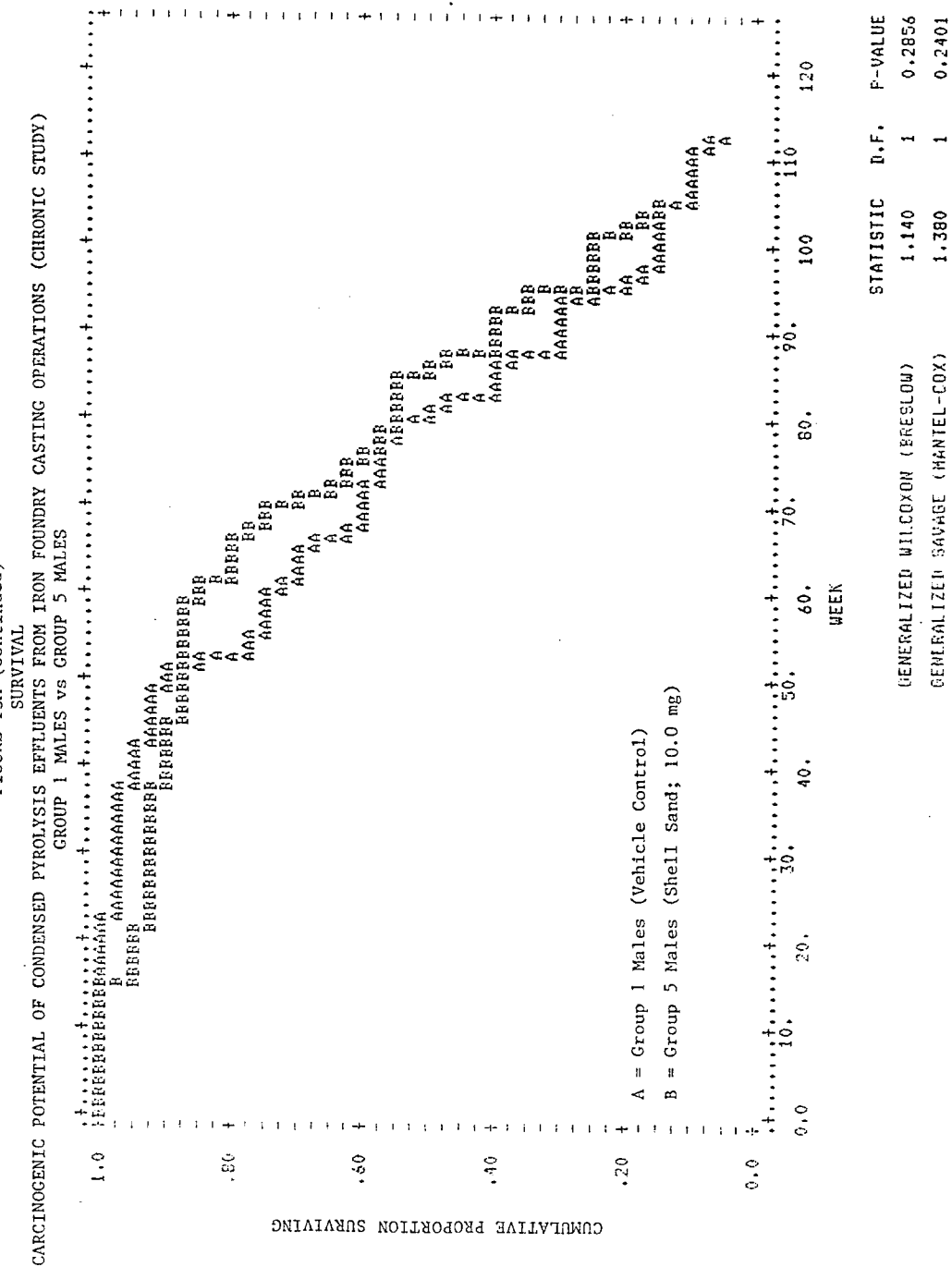


FIGURE 13A (Continued)
 SURVIVAL
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
 GROUP 1 FEMALES vs GROUP 5 FEMALES

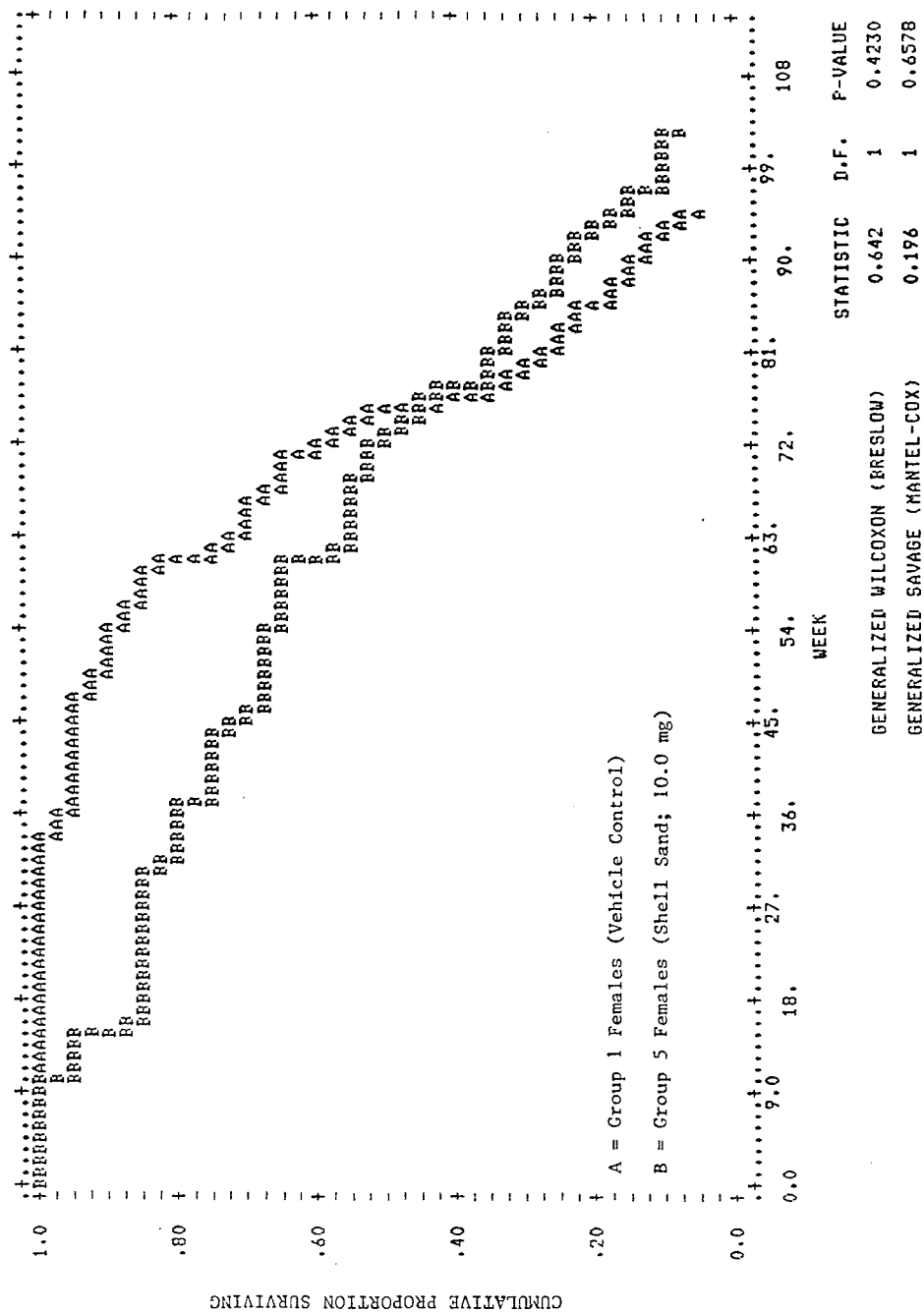
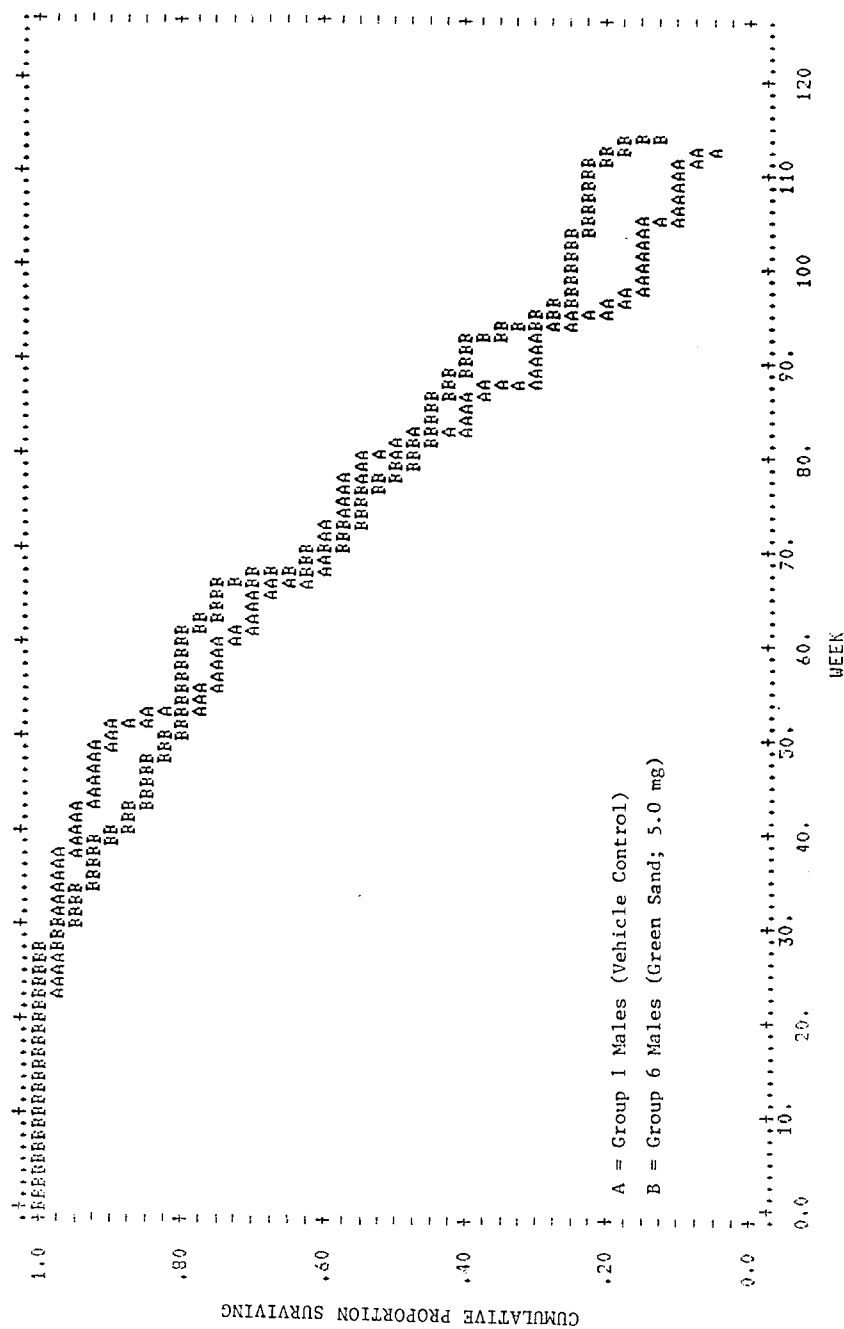


FIGURE 13A (Continued)
SURVIVAL
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUP 1 MALES vs GROUP 6 MALES



	STATISTIC	D.F.	P-VALUE
GENERALIZED WILCOXON (PRESLOW)	0.197	1	0.6570
GENERALIZED SAVAGE (MANTEL-COX)	0.874	1	0.3498

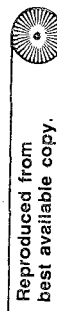


FIGURE 13A (Continued)
SURVIVAL
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUP 1 FEMALES vs GROUP 6 FEMALES

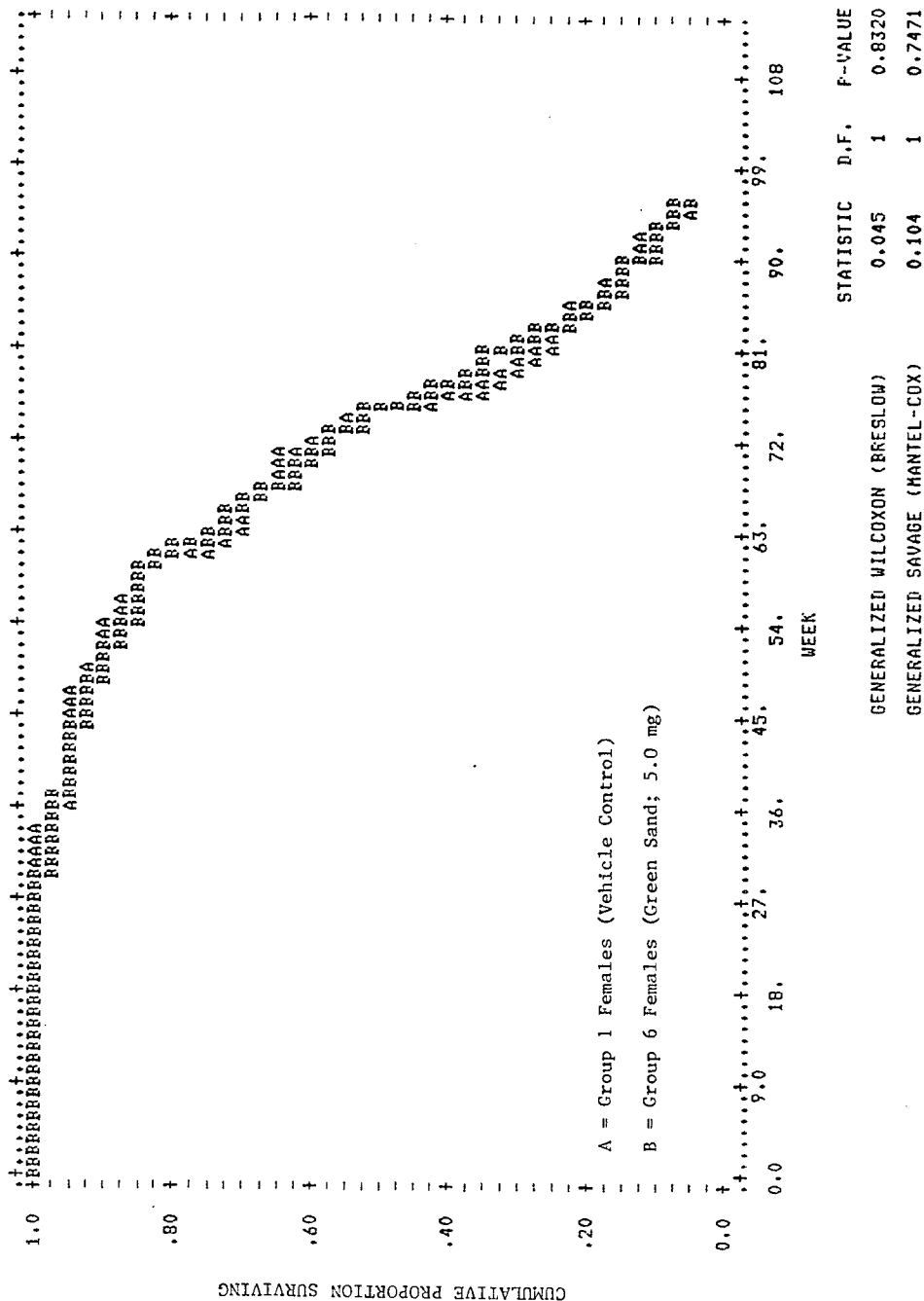
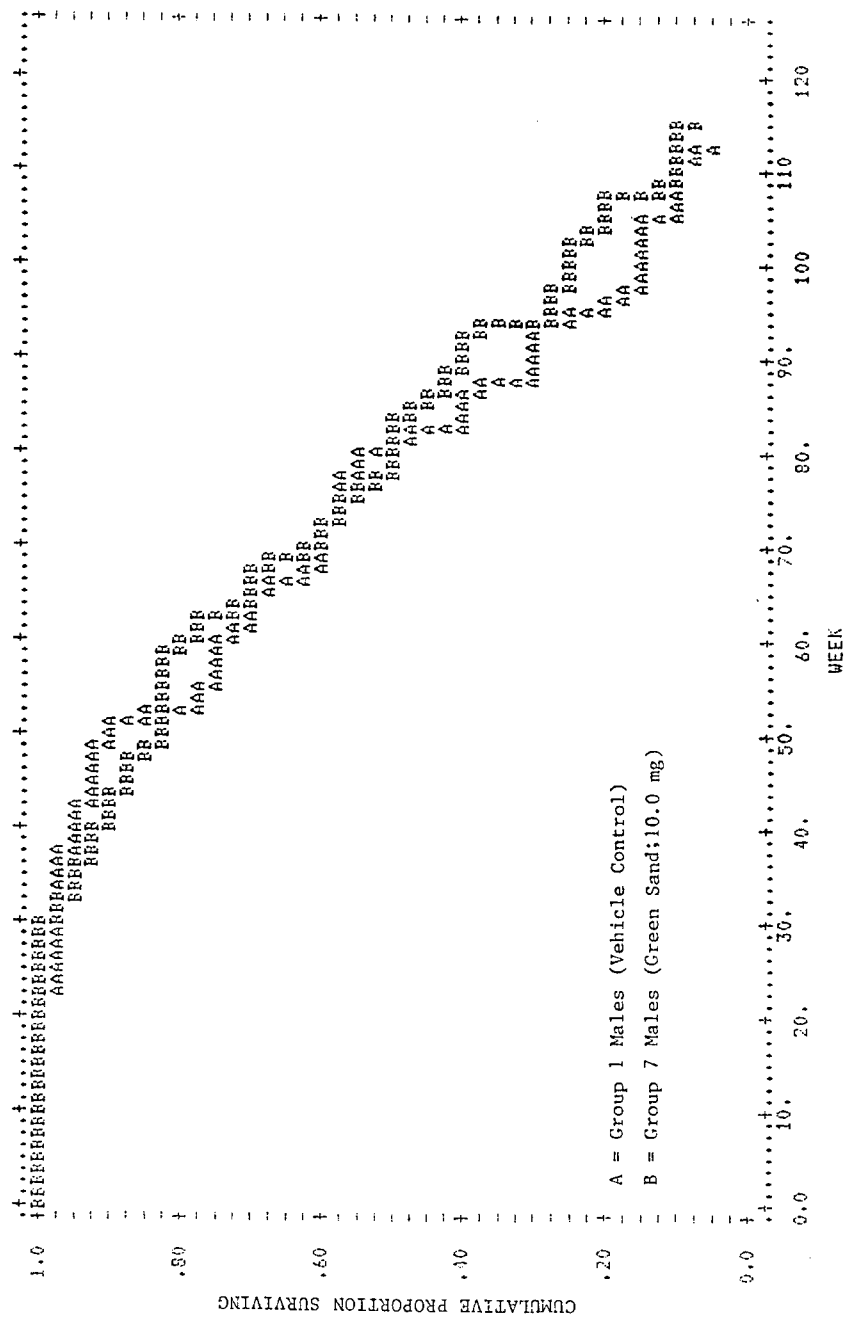
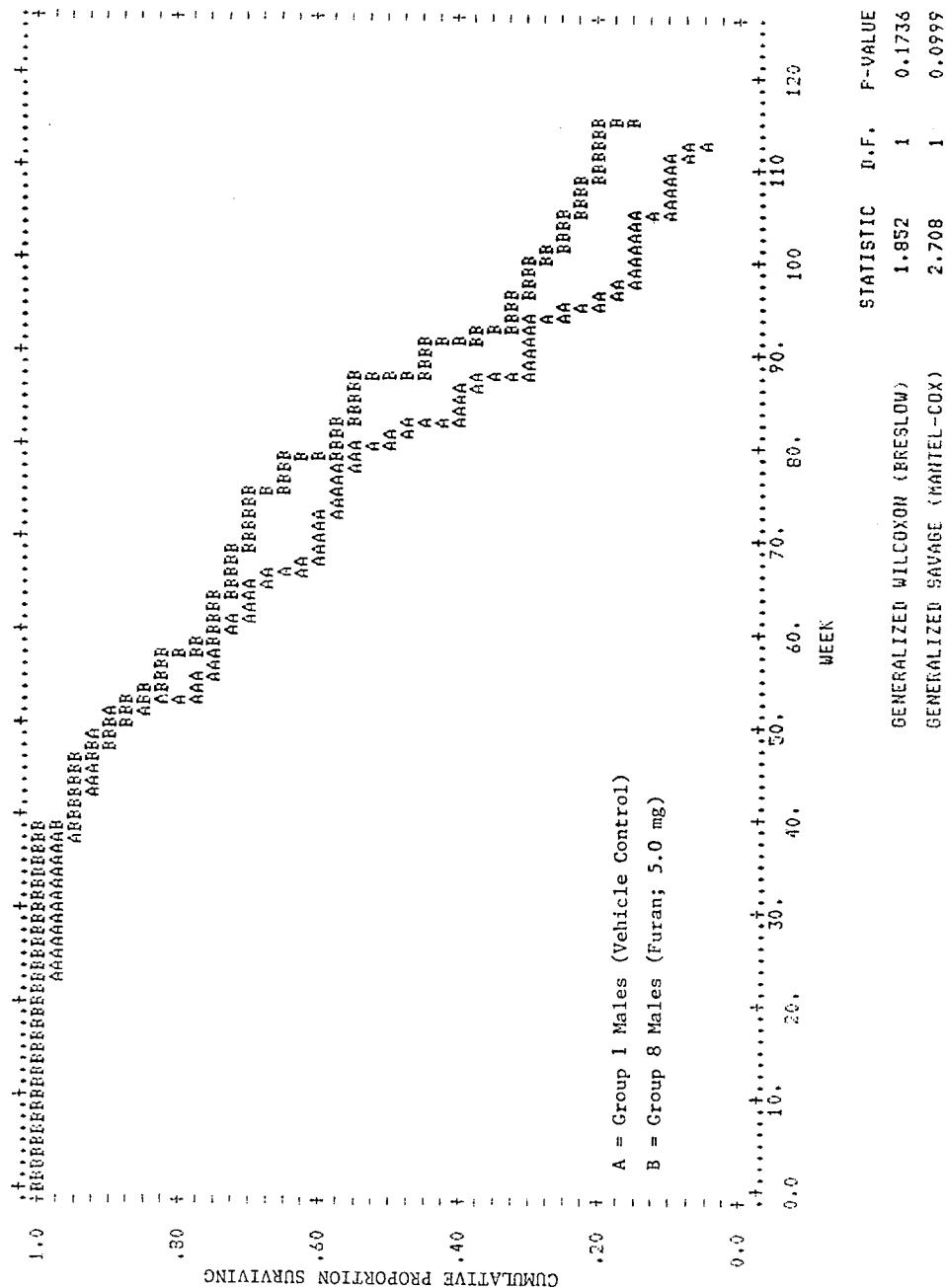


FIGURE 13A (Continued)
SURVIVAL
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUP 1 MALES vs GROUP 7 MALES



	STATISTIC	D.F.	P-VALUE
GENERALIZED WILCOXON (BRESLOW)	0.489	1	0.4843
GENERALIZED SAVAGE (MANTEL-COX)	0.654	1	0.4187

FIGURE 13A (Continued)
SURVIVAL
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUP 1 MALES vs GROUP 8 MALES

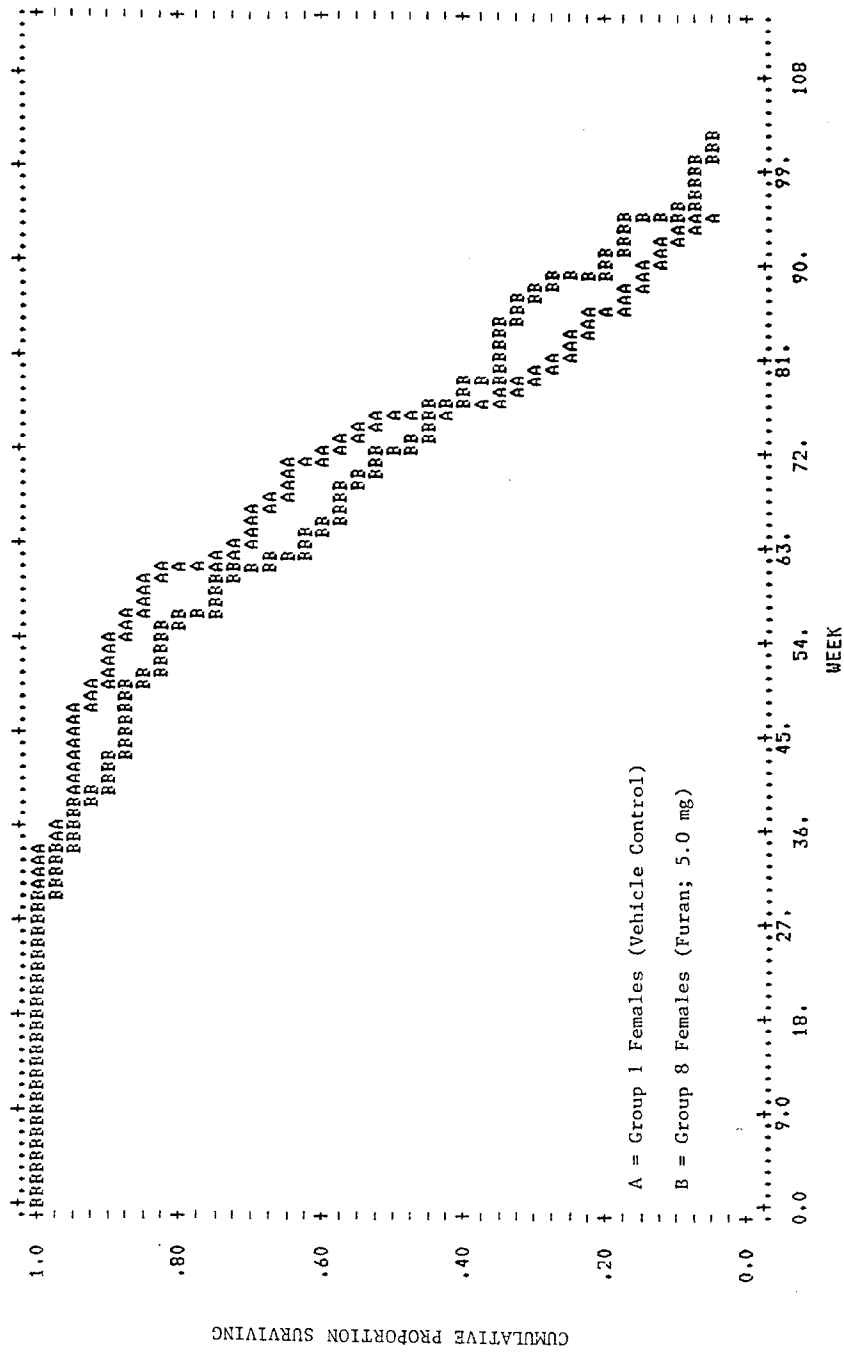


STATISTIC	D.F.	F-VALUE
GENERALIZED WILCOXON (BRESLOW)	1	0.1736
GENERALIZED SAVAGE (MANTEL-COX)	1	0.0999

Reproduced from
best available copy.

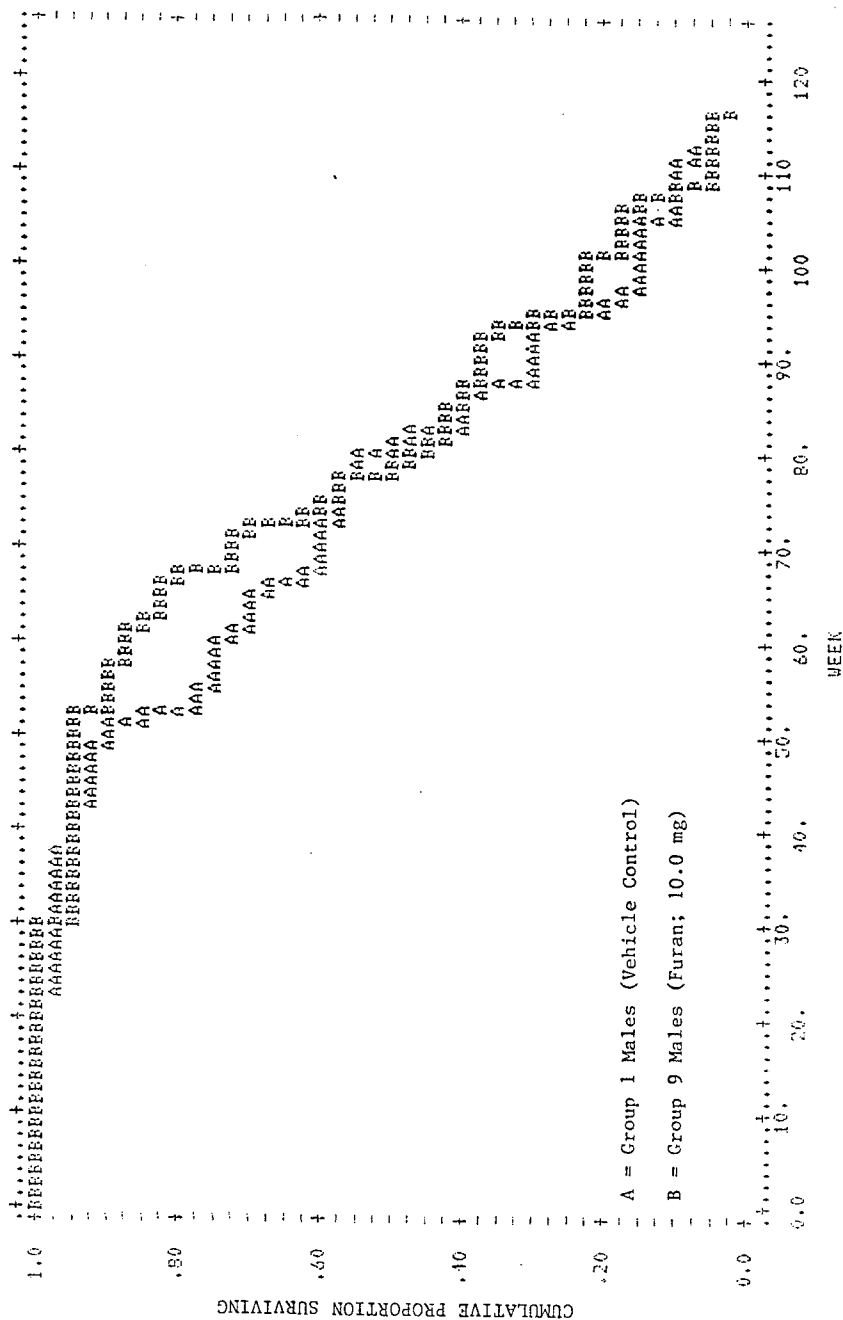
FIGURE 13A (Continued)

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
SURVIVAL
GROUP 1 FEMALES vs GROUP 8 FEMALES



	STATISTIC	D.F.	P-VALUE
GENERALIZED WILCOXON (PRESLOW)	0.021	1	0.8834
GENERALIZED SAVAGE (MANTEL-COX)	0.319	1	0.5722

FIGURE 13A (Continued)
SURVIVAL
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUP 1 MALES vs GROUP 9 MALES



STATISTIC	D.F.	P-VALUE
GENERALIZED WILCOXON (BRESLOW)	1	0.4815
GENERALIZED SNAPE (MANTEL-COX)	1	0.9079

Reproduced from
best available copy.

FIGURE 13A (Continued)
SURVIVAL
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUP 1 FEMALES vs GROUP 9 FEMALES

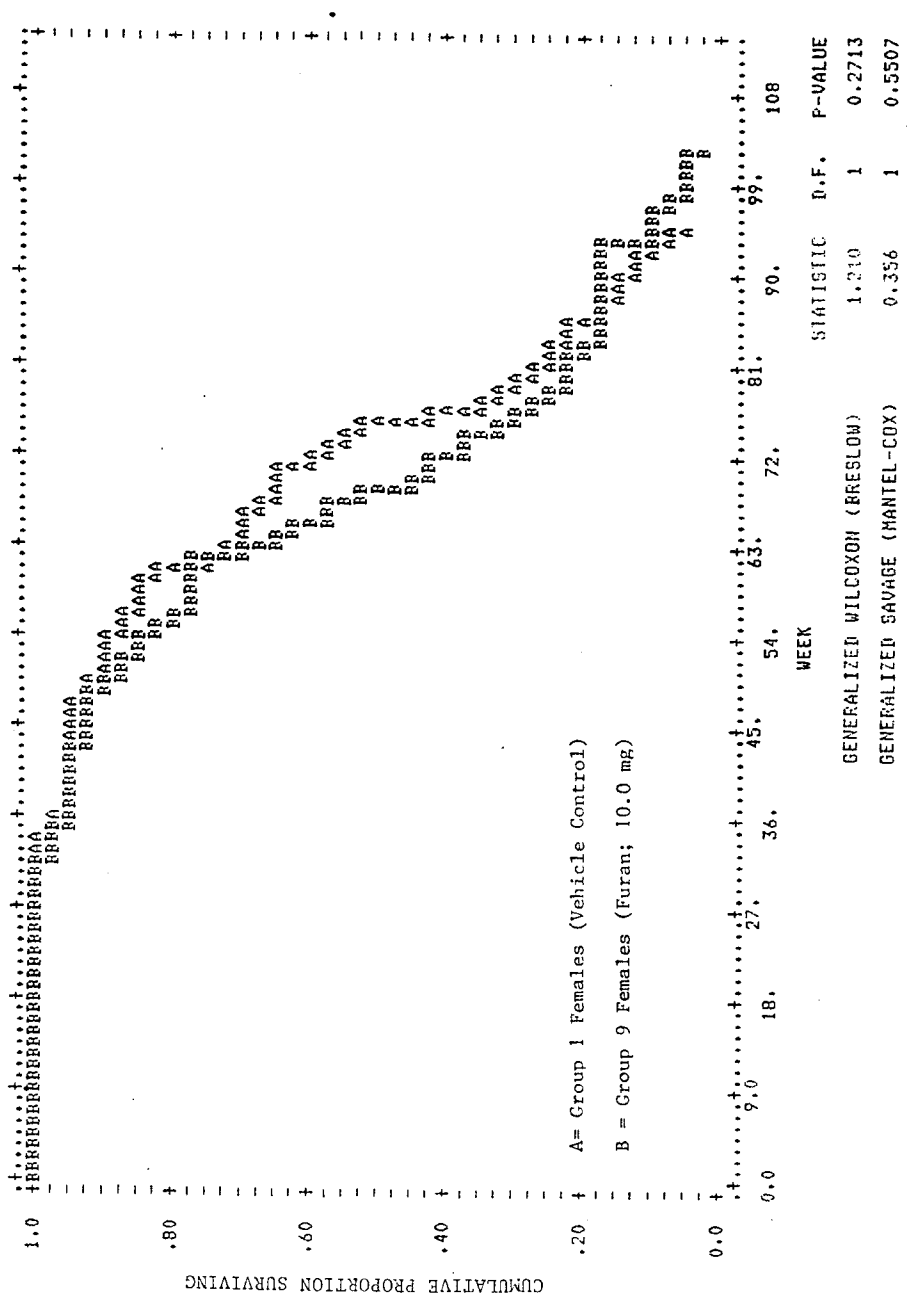
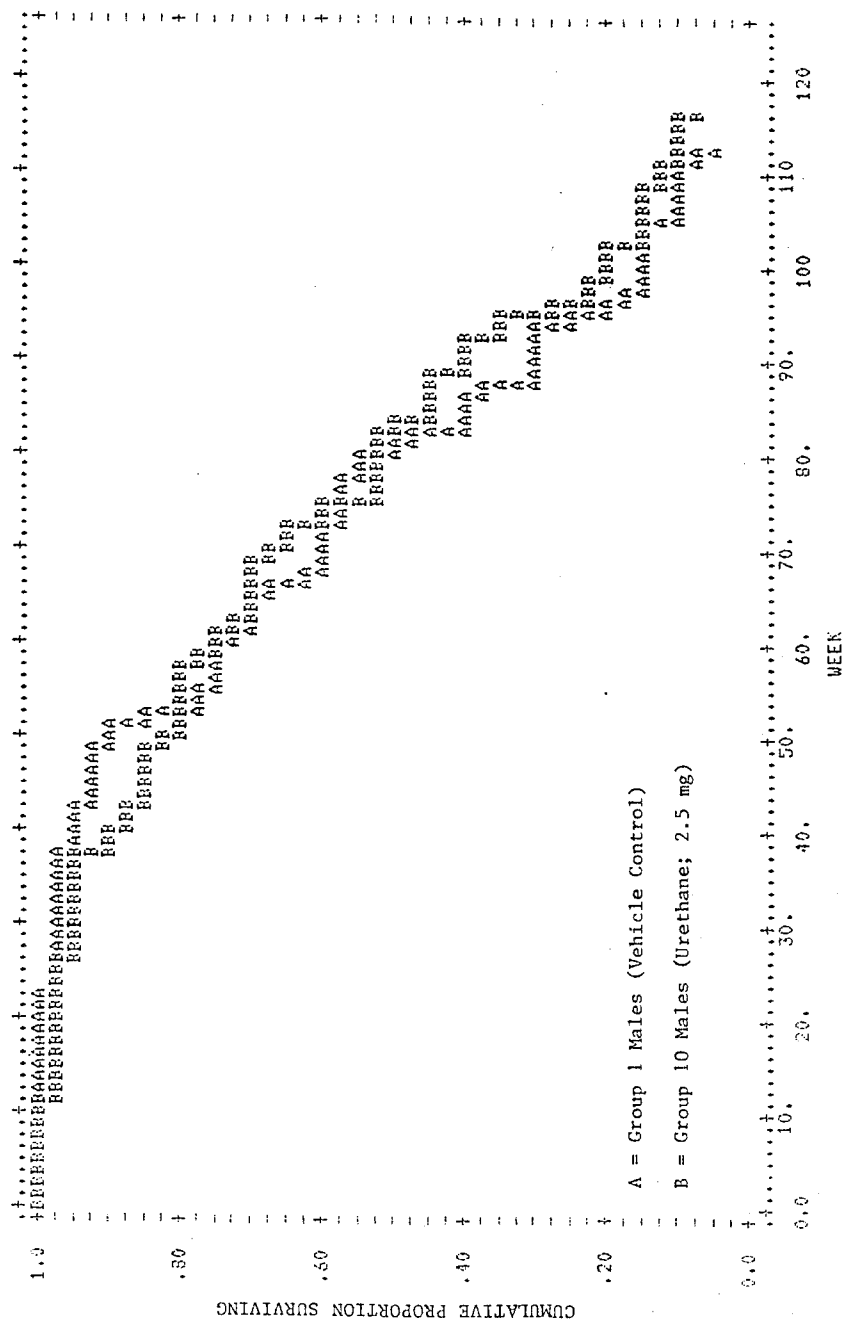


FIGURE 13A (Continued)

SURVIVAL

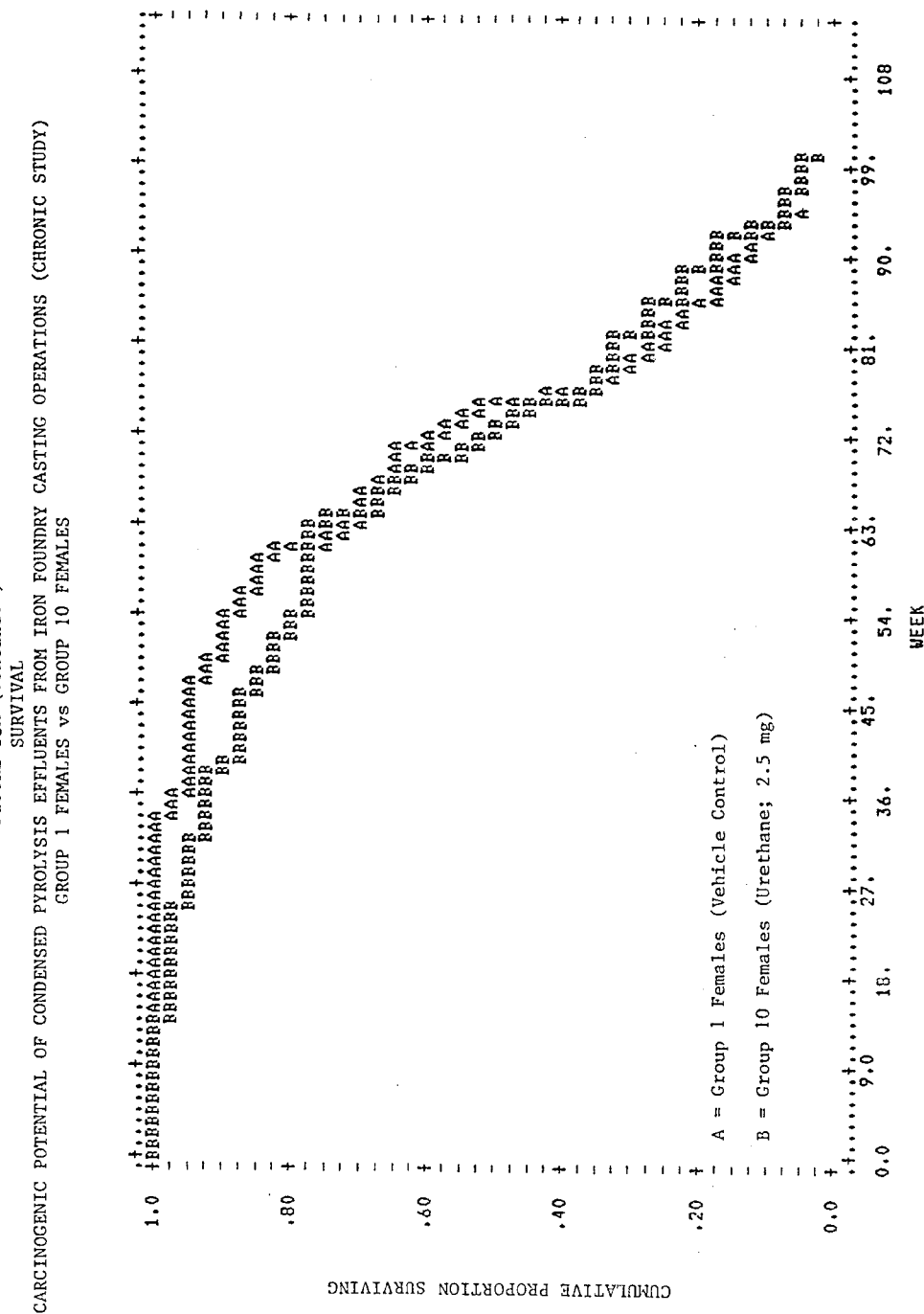
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)

GROUP 1 MALES vs GROUP 10 MALES



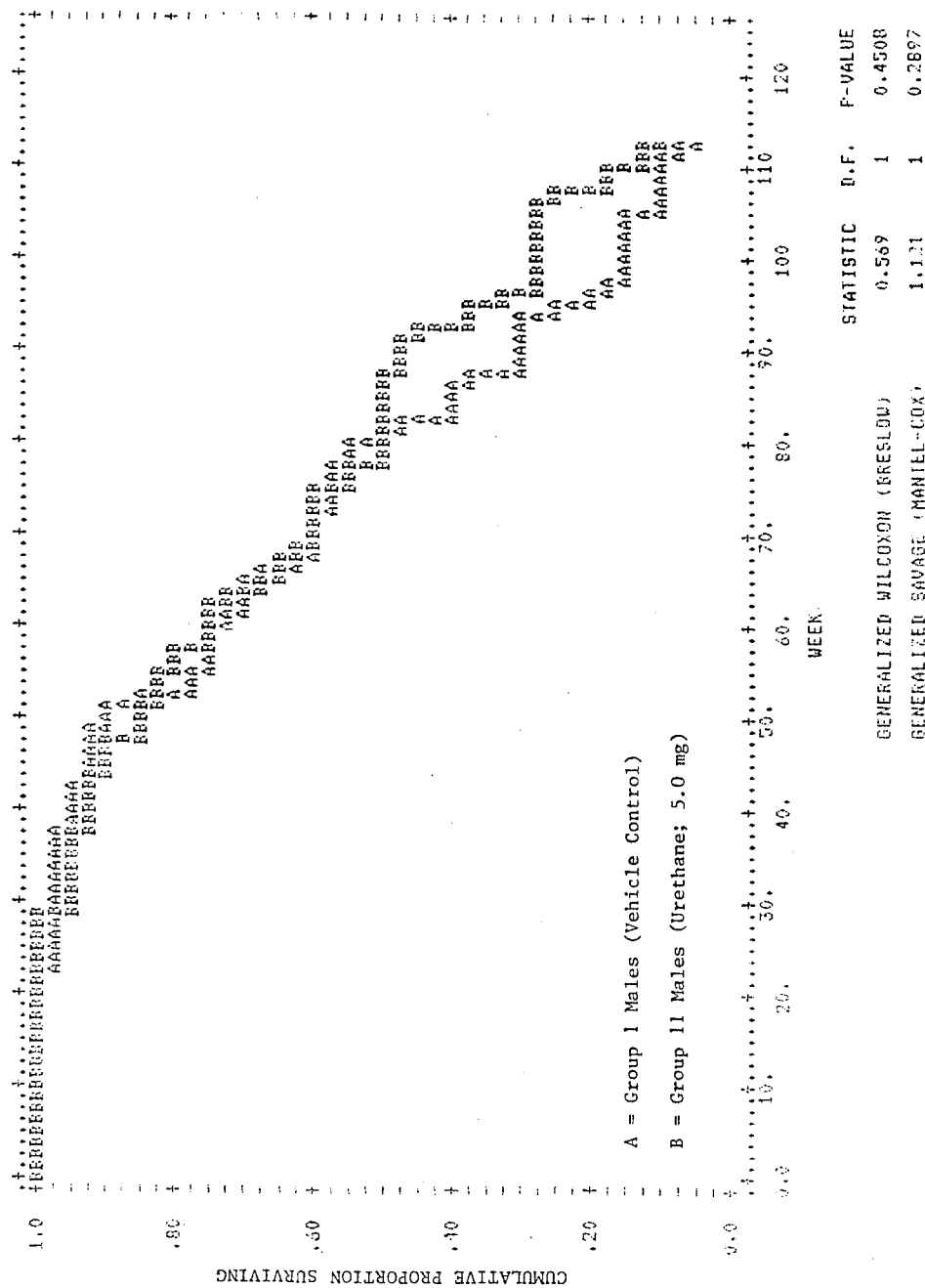
STATISTIC	D.F.	P-VALUE
GENERALIZED WILCOXON (KRESLOW)	1	0.6571
GENERALIZED SAVAGE (MANTEL-COX)	1	0.5324

FIGURE 13A (Continued)



STATISTIC	D.F.	P-VALUE
GENERALIZED WILCOXON (RESLOW)	1	0.7718
GENERALIZED SAVAGE (MANTEL-COX)	1	0.9890

FIGURE 13A (Continued)
SURVIVAL
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUP 1 MALES vs GROUP 11 MALES



Reproduced from
best available copy.

FIGURE 13A (Continued)
SURVIVAL
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUP 1 FEMALES vs GROUP 11 FEMALES

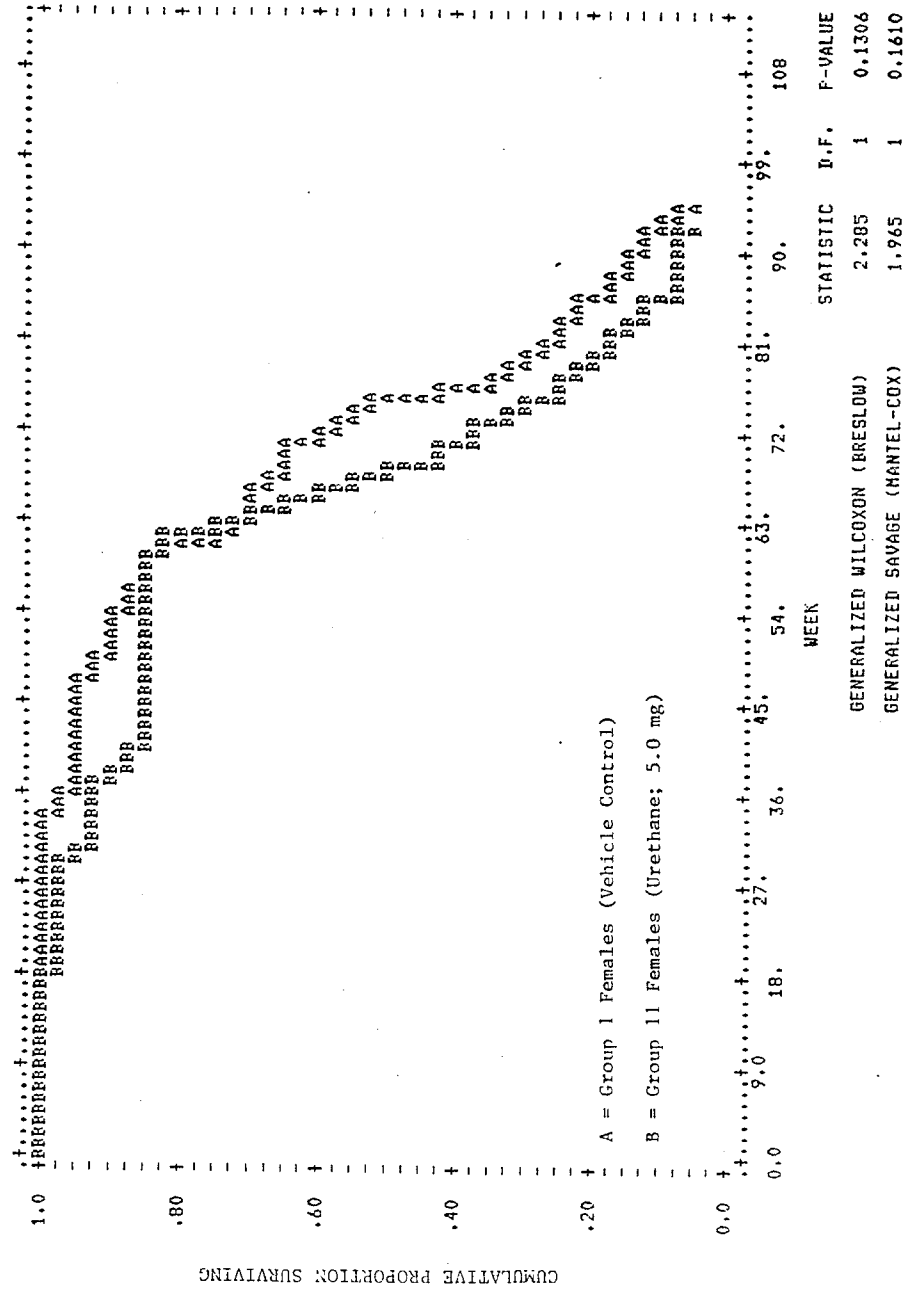
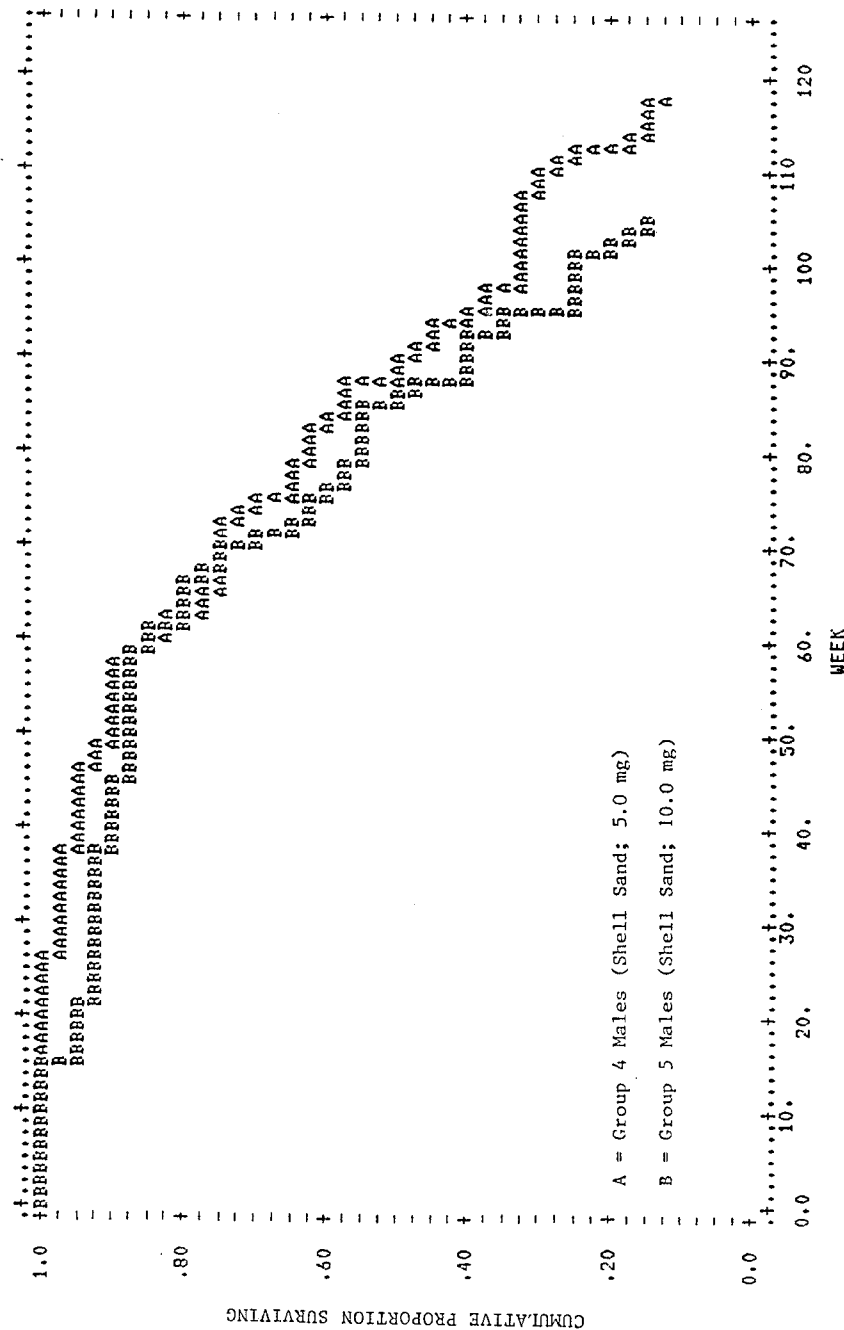


FIGURE 13 B
SURVIVAL.
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUP 4 MALES vs GROUP 5 MALES



	STATISTIC	D.F.	F-VALUE
GENERALIZED WILCOXON (BRESLOW)	0.901	1	0.3426
GENERALIZED SAVAGE (MANTEL-COX)	0.499	1	0.4801

FIGURE 13B (Continued)
SURVIVAL
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUP 4 FEMALES vs GROUP 5 FEMALES

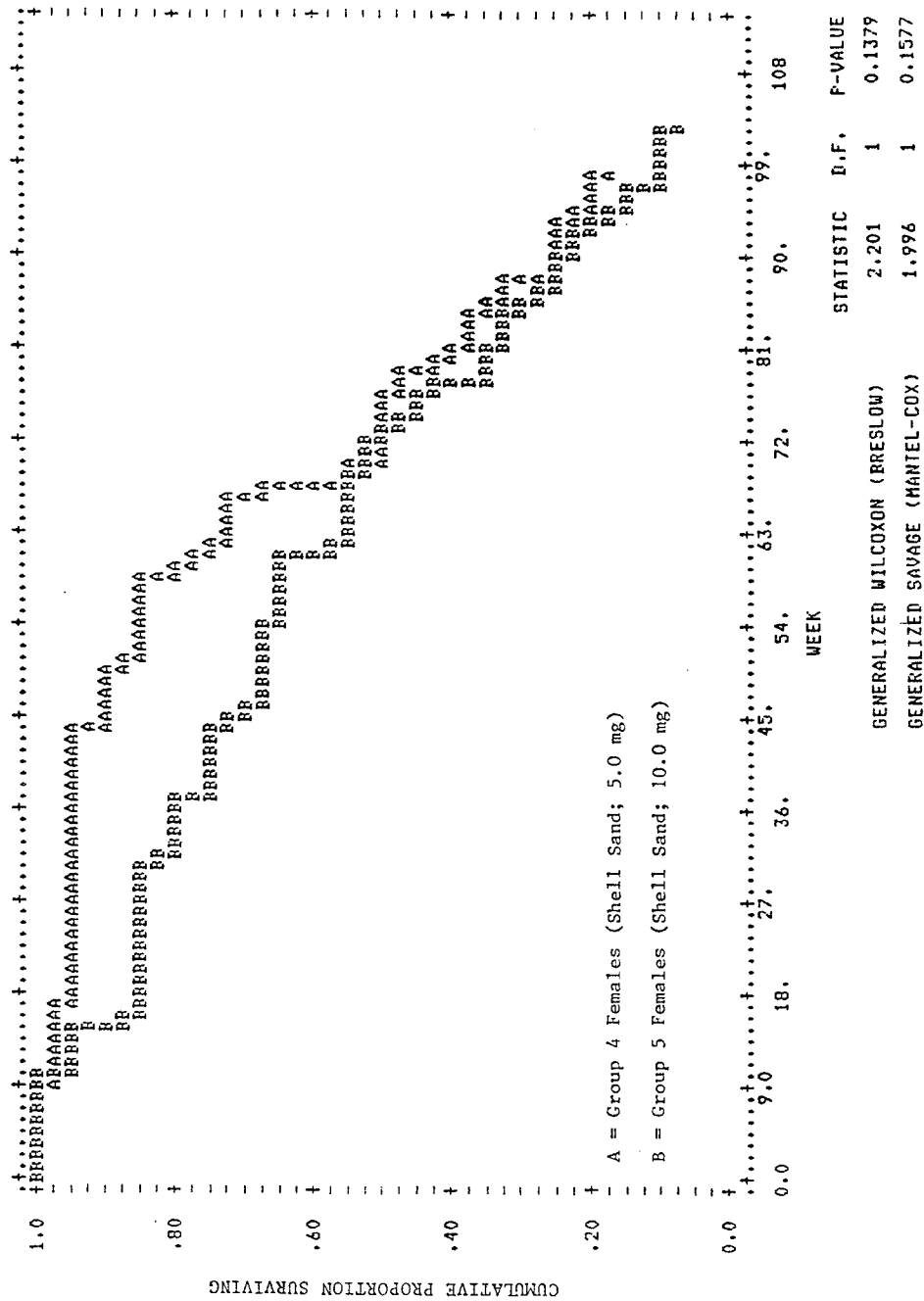


FIGURE 13B (Continued)
 SURVIVAL
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
 GROUP 6 MALES vs GROUP 7 MALES

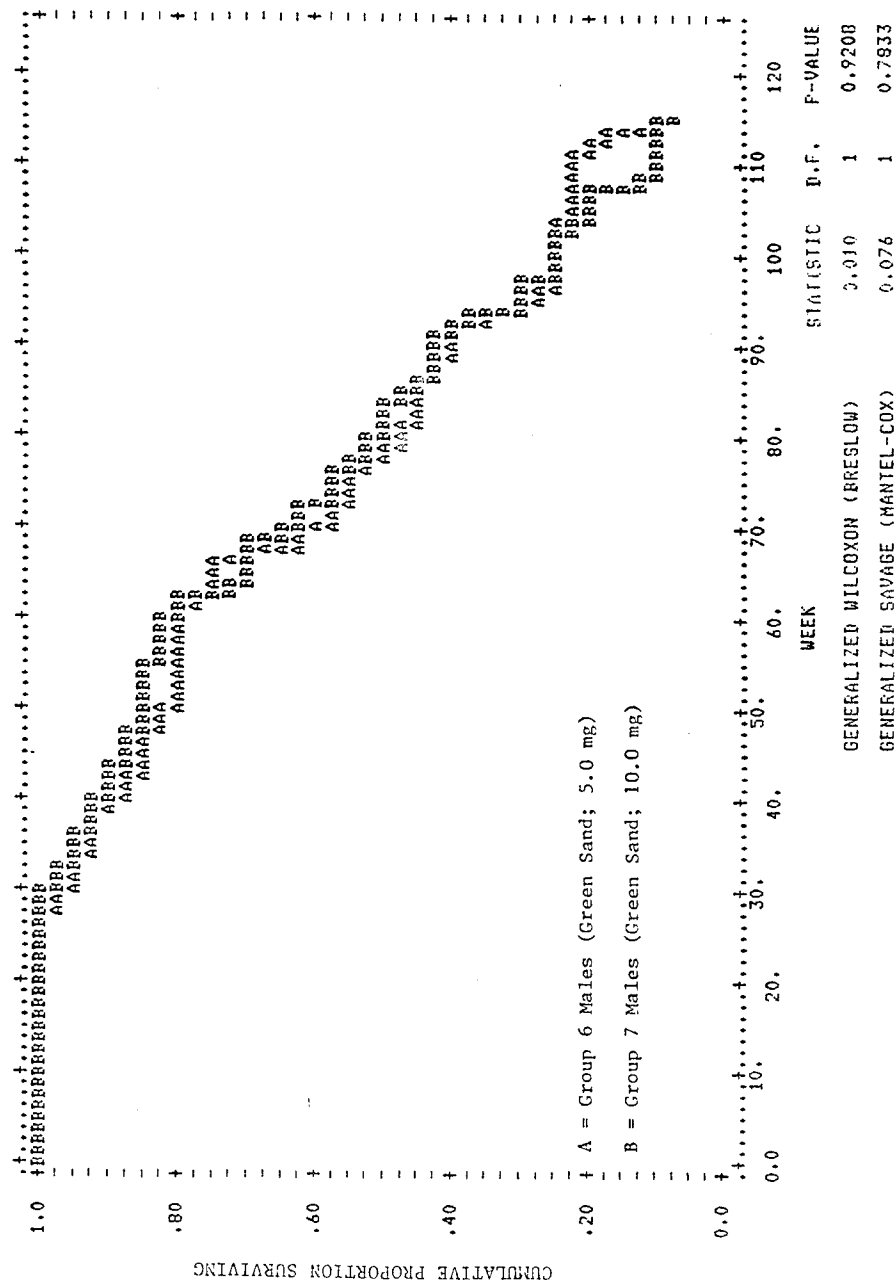
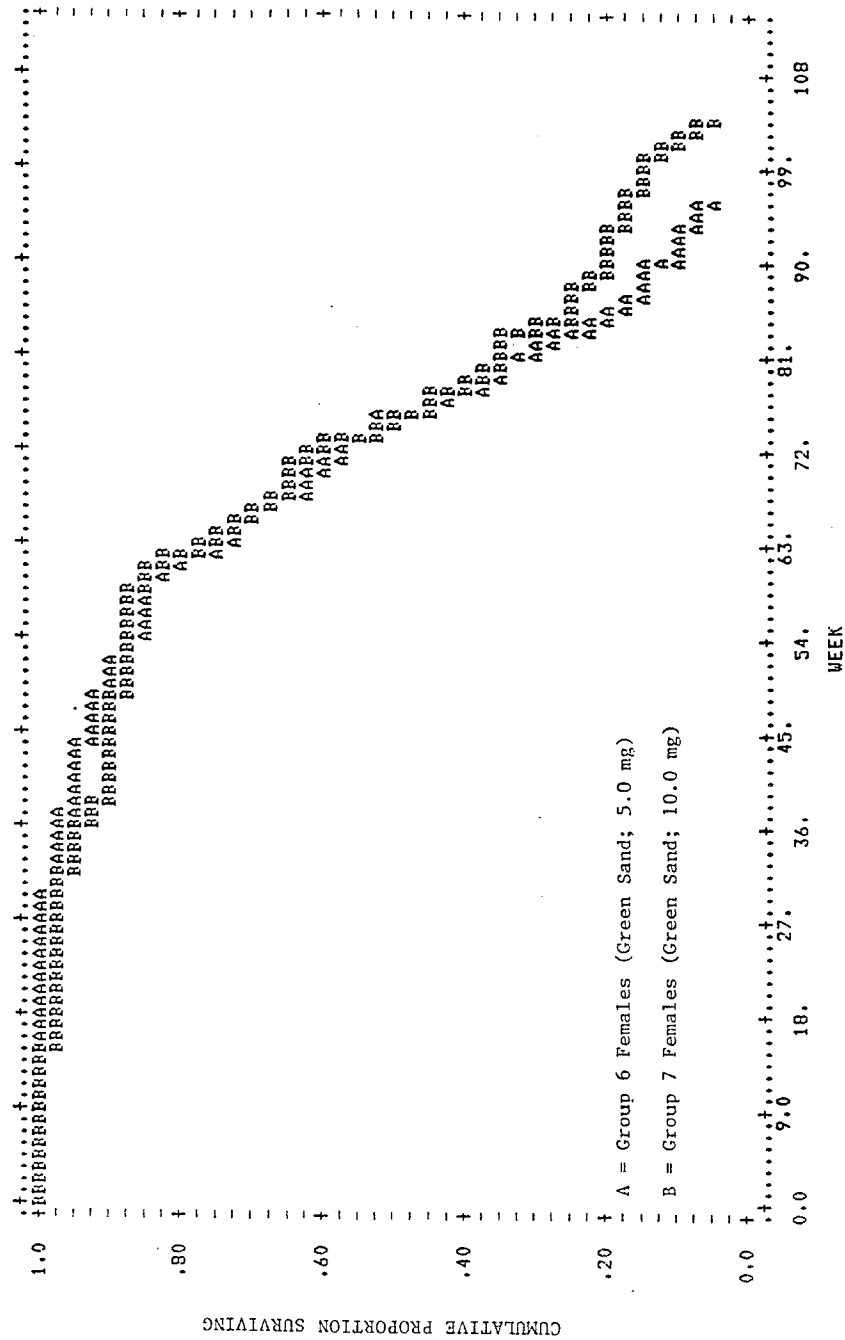


FIGURE 13B (Continued)

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUP 6 FEMALES vs GROUP 7 FEMALES



	STATISTIC	D.F.	P-VALUE
GENERALIZED WILCOXON (BRESLOW)	0.188	1	0.6649
GENERALIZED SAVAGE (MANTEL-COX)	0.397	1	0.5287

FIGURE 13 B (Continued)

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
SURVIVAL
GROUP 8 MALES vs GROUP 9 MALES

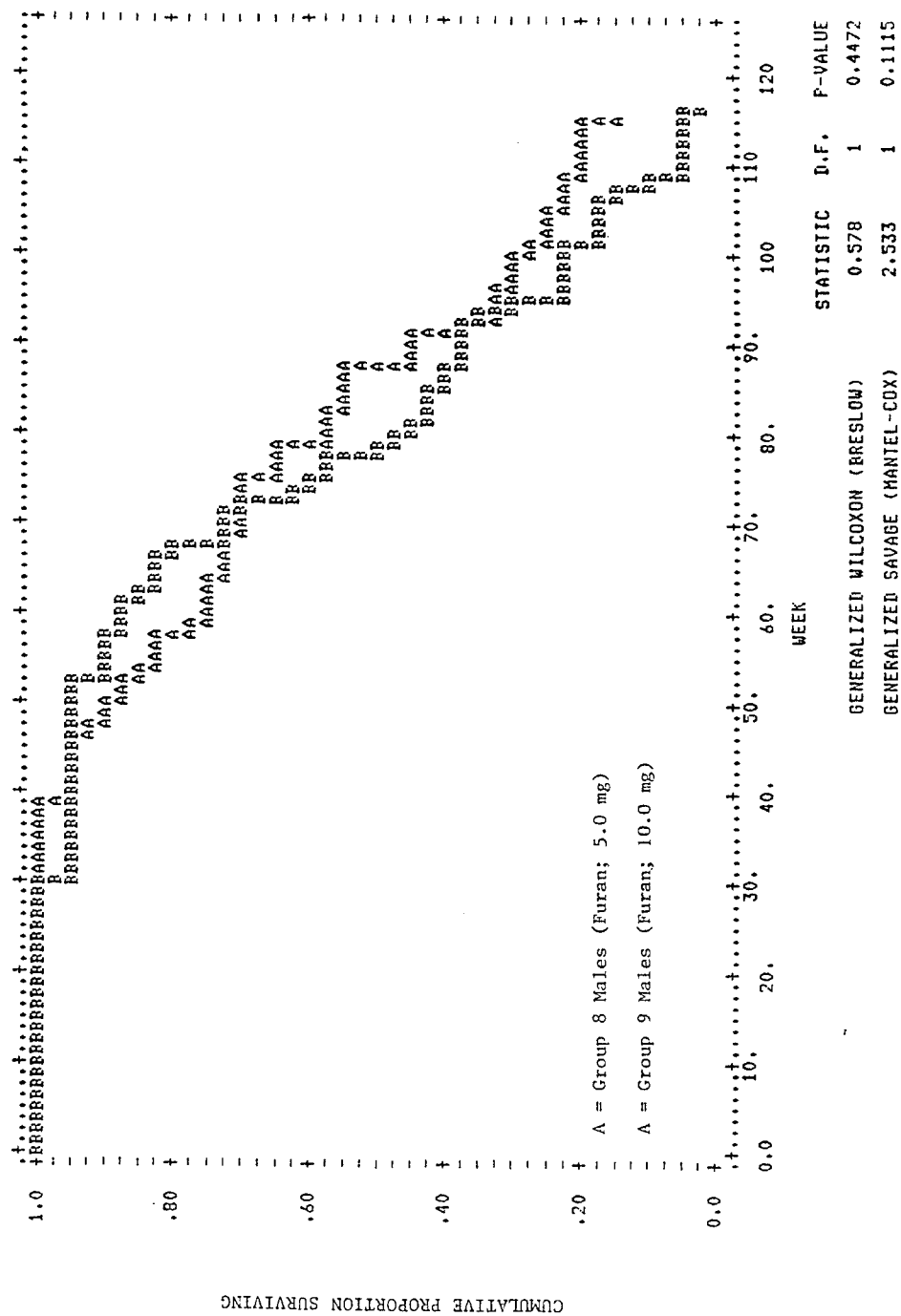
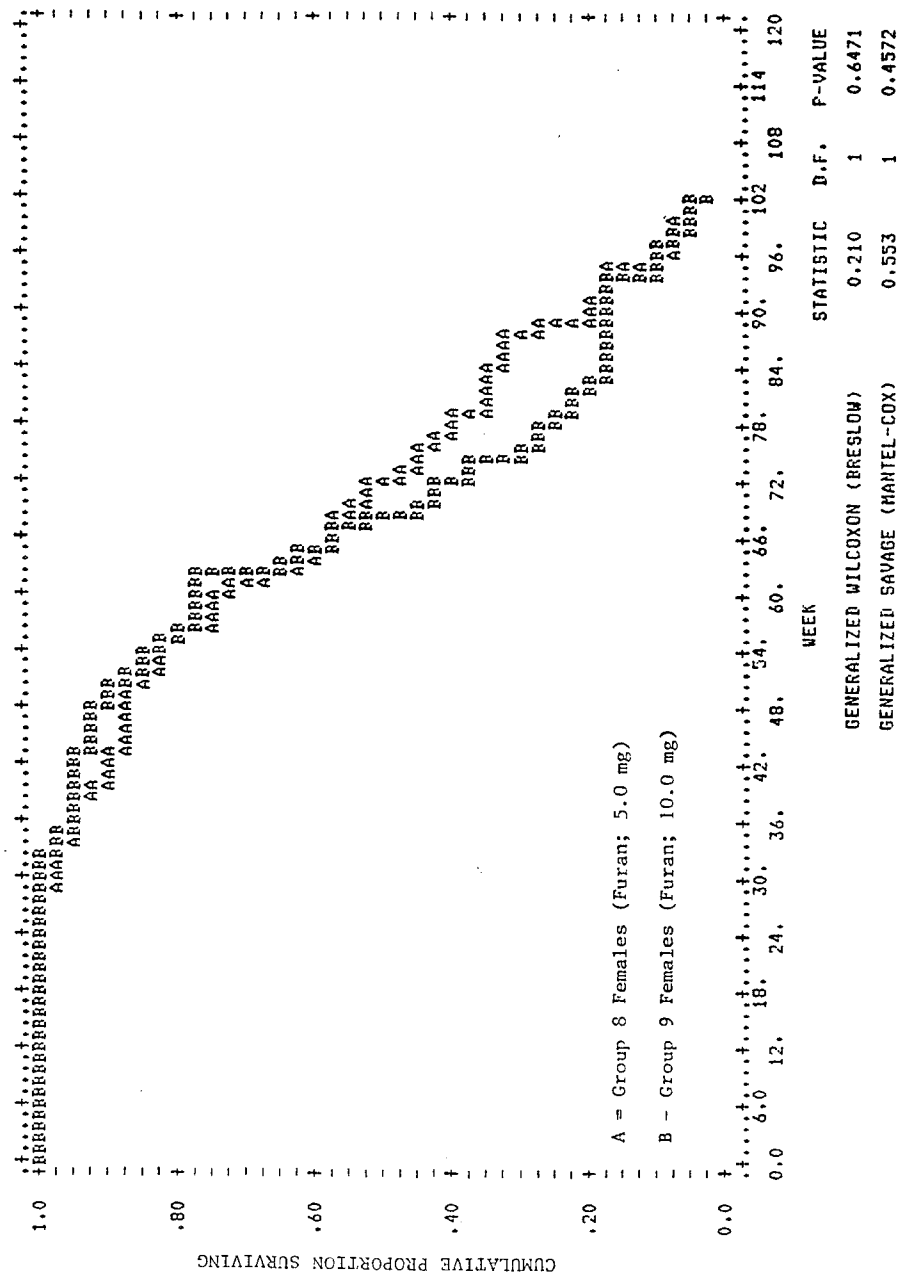


FIGURE 13B (Continued)
SURVIVAL
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUP 8 FEMALES vs GROUP 9 FEMALES



STATISTIC	D.F.	P-VALUE
GENERALIZED WILCOXON (BRESLOW)	0.210	1
GENERALIZED SAVAGE (MANTEL-COX)	0.553	1

FIGURE 13B (Continued)
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
 GROUP 10 MALES vs GROUP 11 MALES

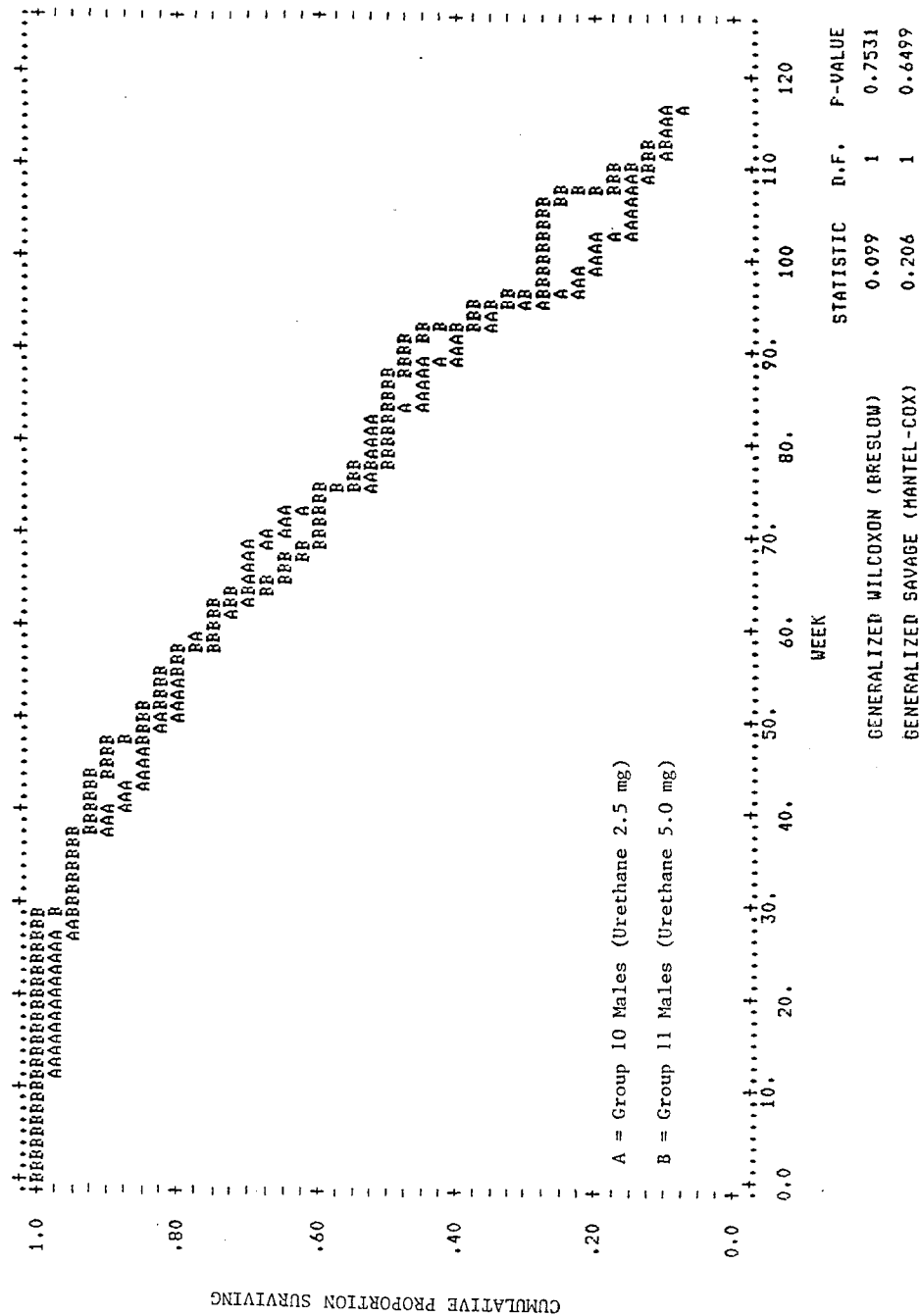


FIGURE 13B (Continued)
SURVIVAL
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUP 10 FEMALES vs GROUP 11 FEMALES

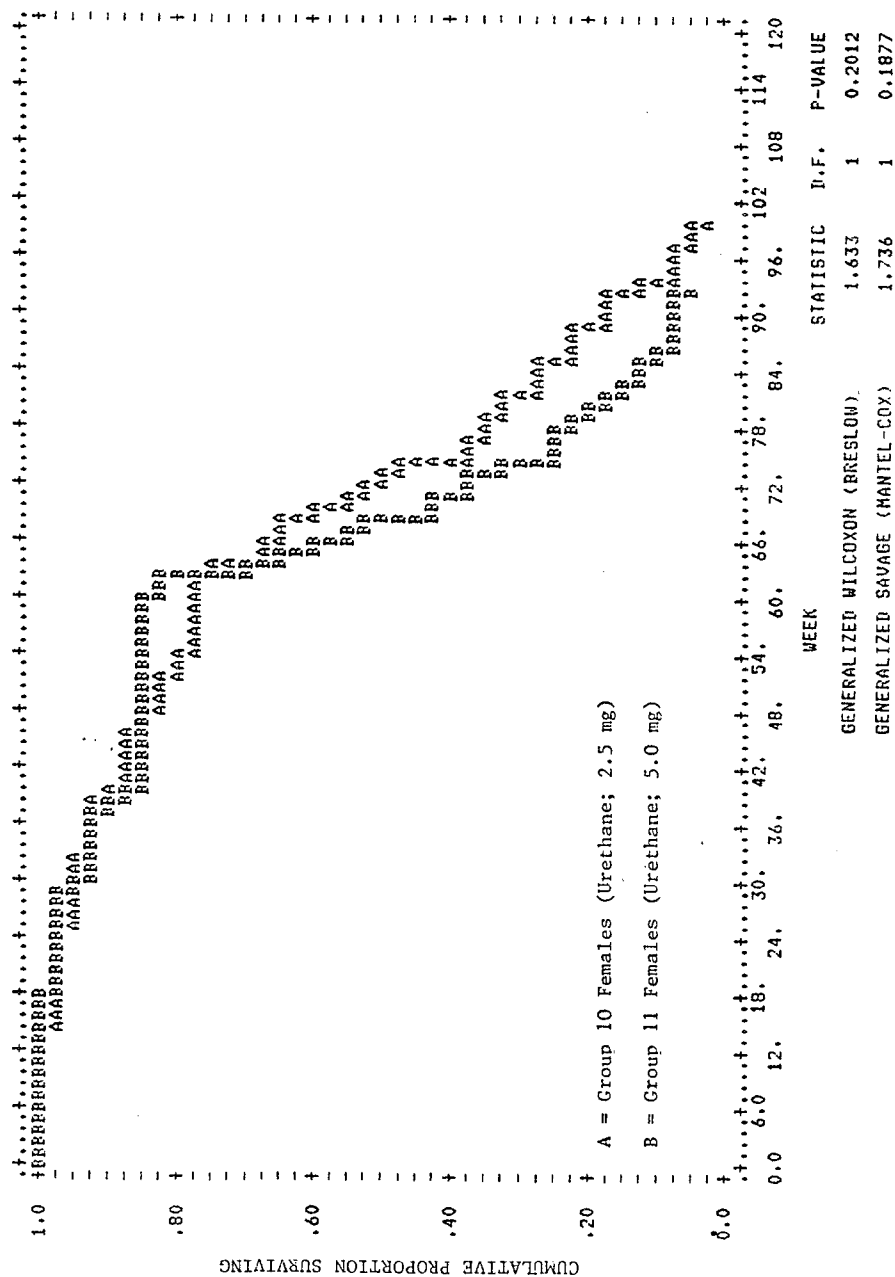


FIGURE 13C
SURVIVAL
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUP 1 MALES vs GROUP 1 FEMALES

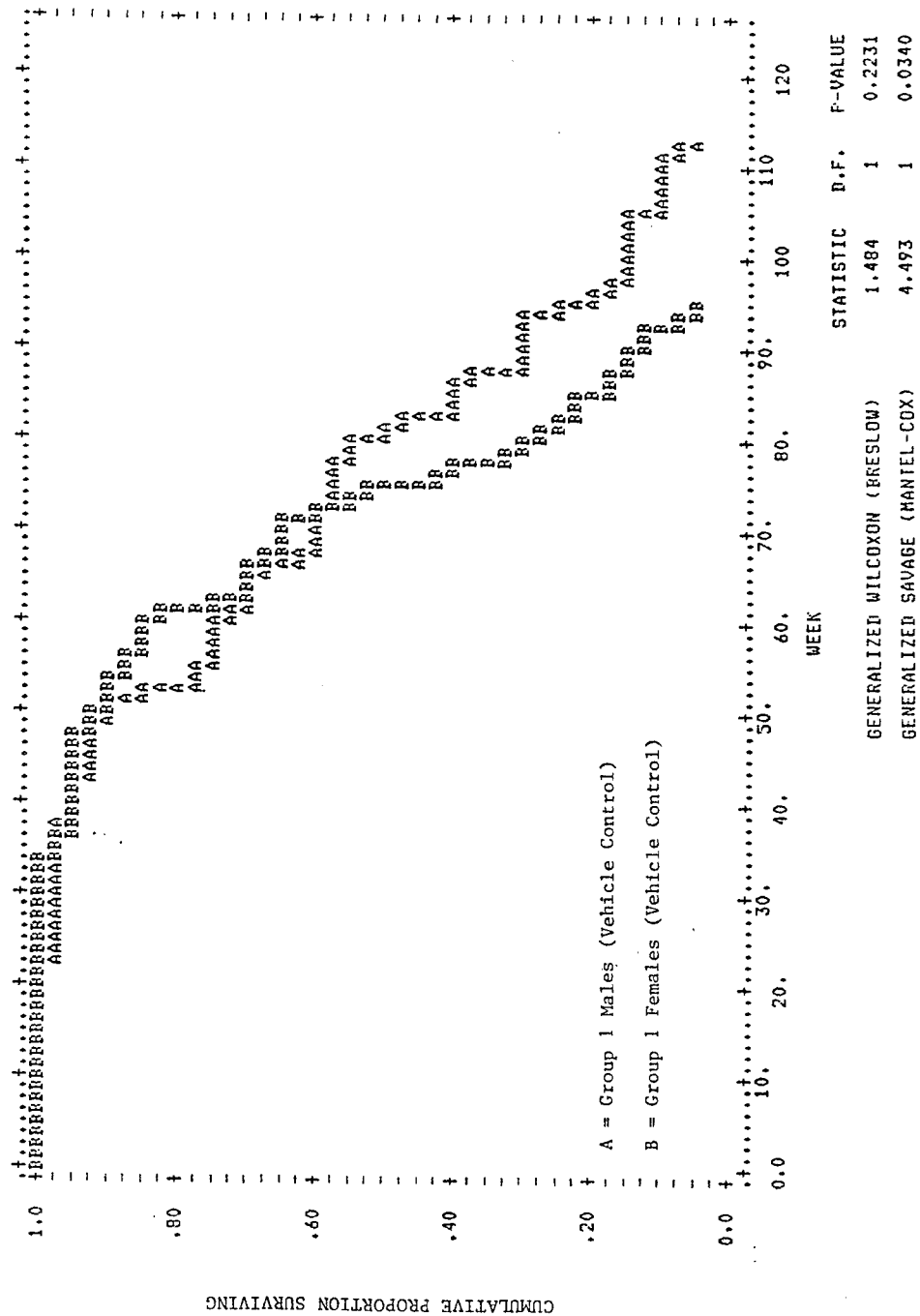
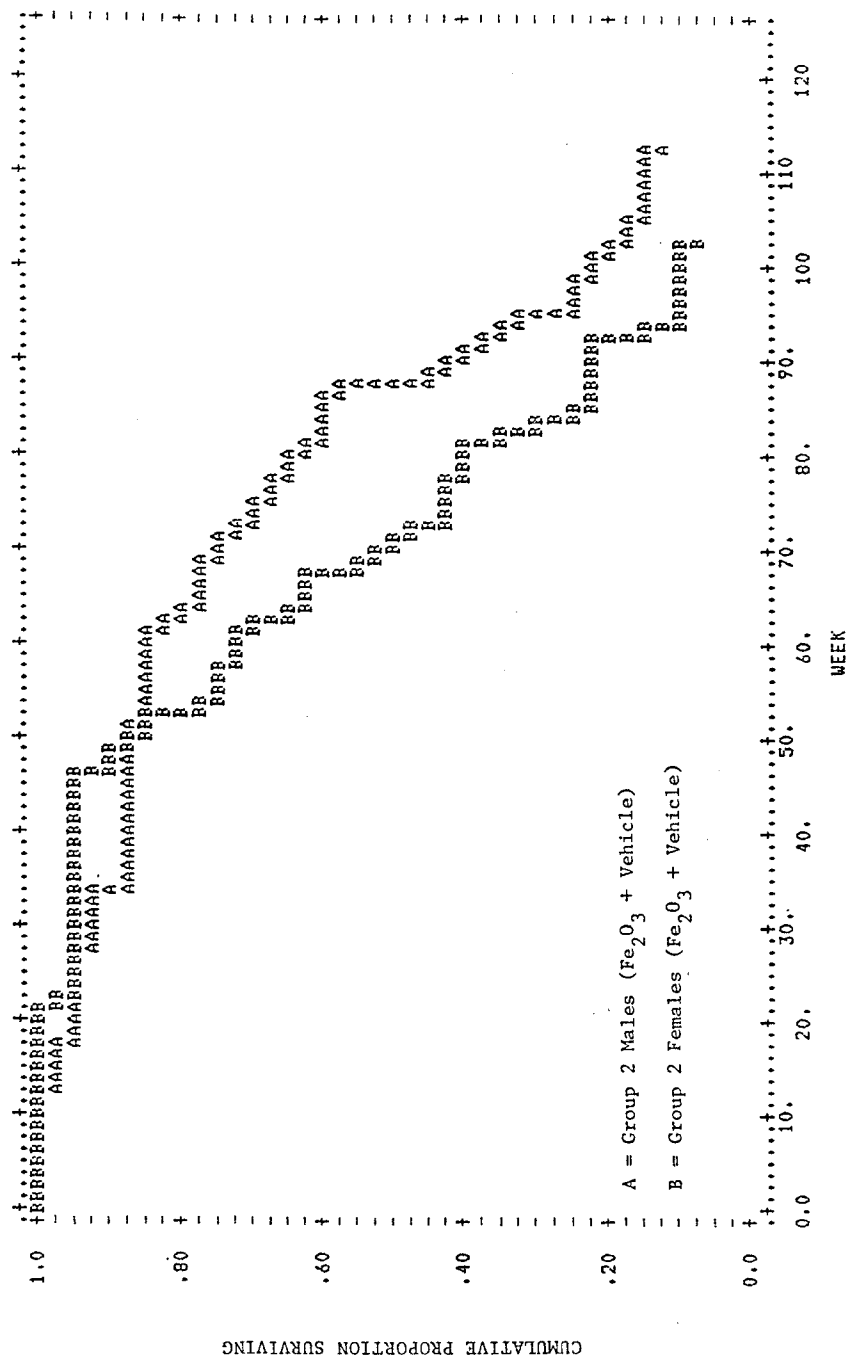


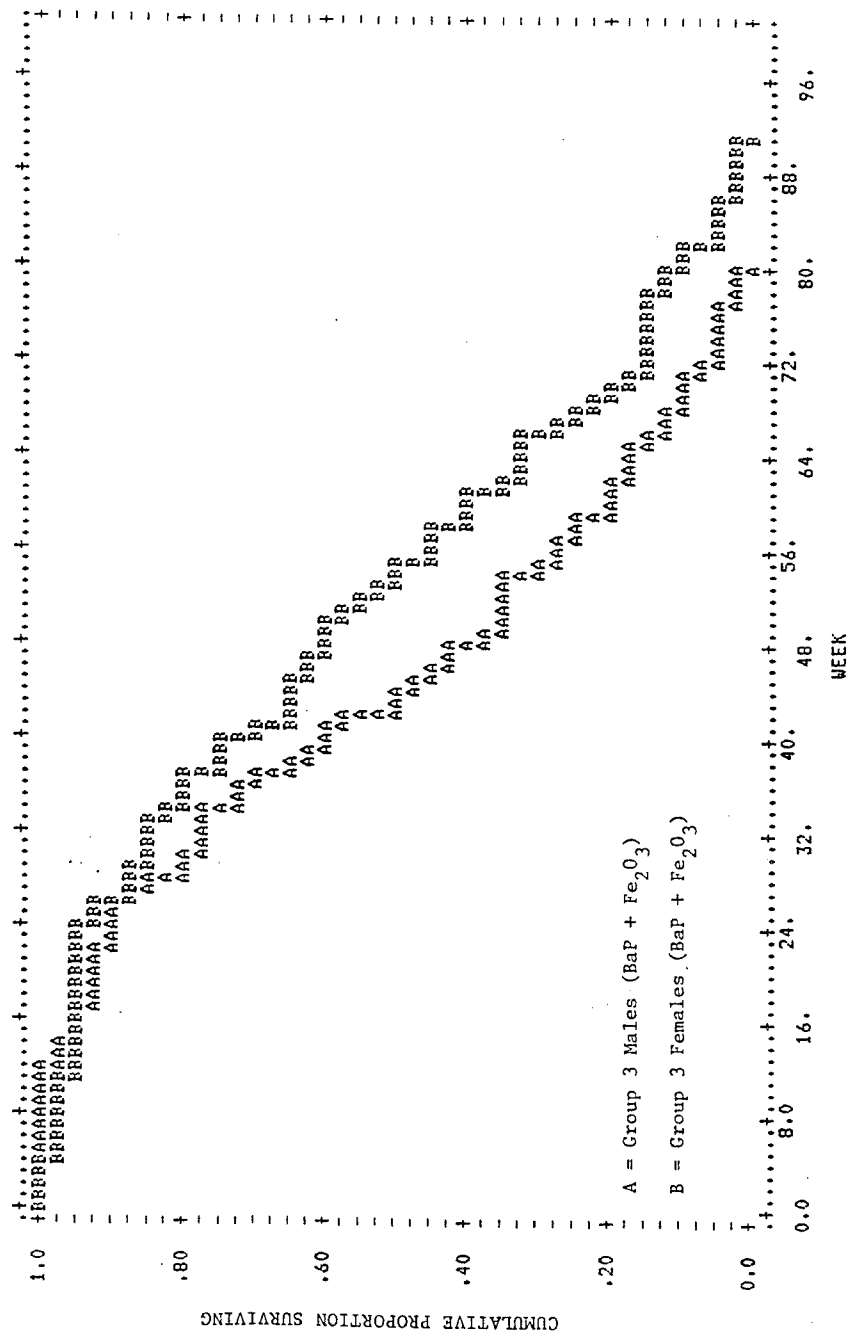
FIGURE 13C (Continued)

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
SURVIVAL
GROUP 2 MALES vs GROUP 2 FEMALES



	STATISTIC	D.F.	P-VALUE
GENERALIZED WILCOXON (BRESLOW)	7.216	1	0.0072
GENERALIZED SAVAGE (MANTEL-COX)	6.946	1	0.0084

FIGURE 13C (Continued)
SURVIVAL
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUP 3 MALES vs GROUP 3 FEMALES



	STATISTIC	D.F.	P-VALUE
GENERALIZED WILCOXON (BRESLOW)	3.705	1	0.0542
GENERALIZED SAVAGE (MANTEL-COX)	5.528	1	0.0187

FIGURE 13C (Continued)
 SURVIVAL
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
 GROUP 4 MALES vs GROUP 4 FEMALES

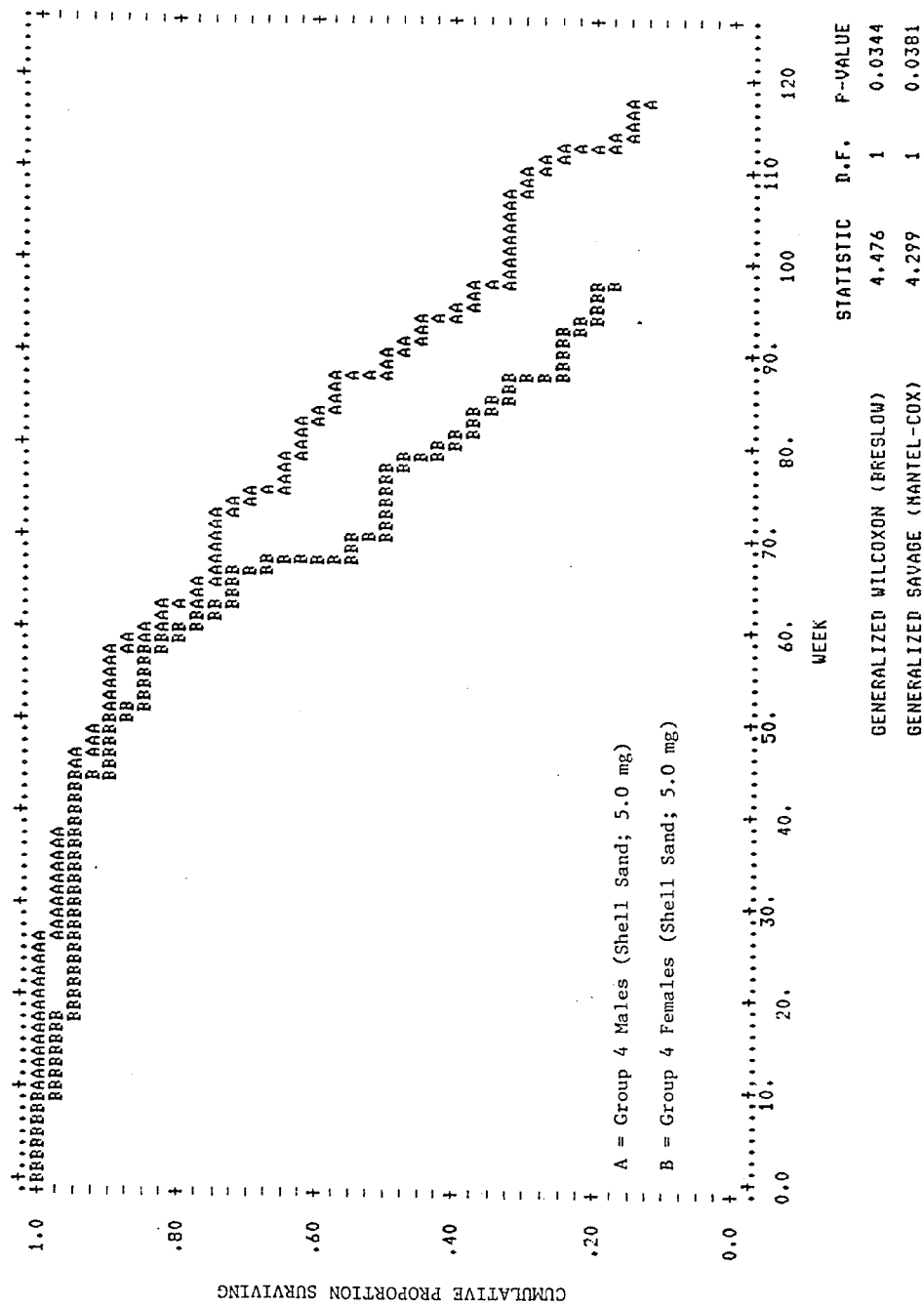
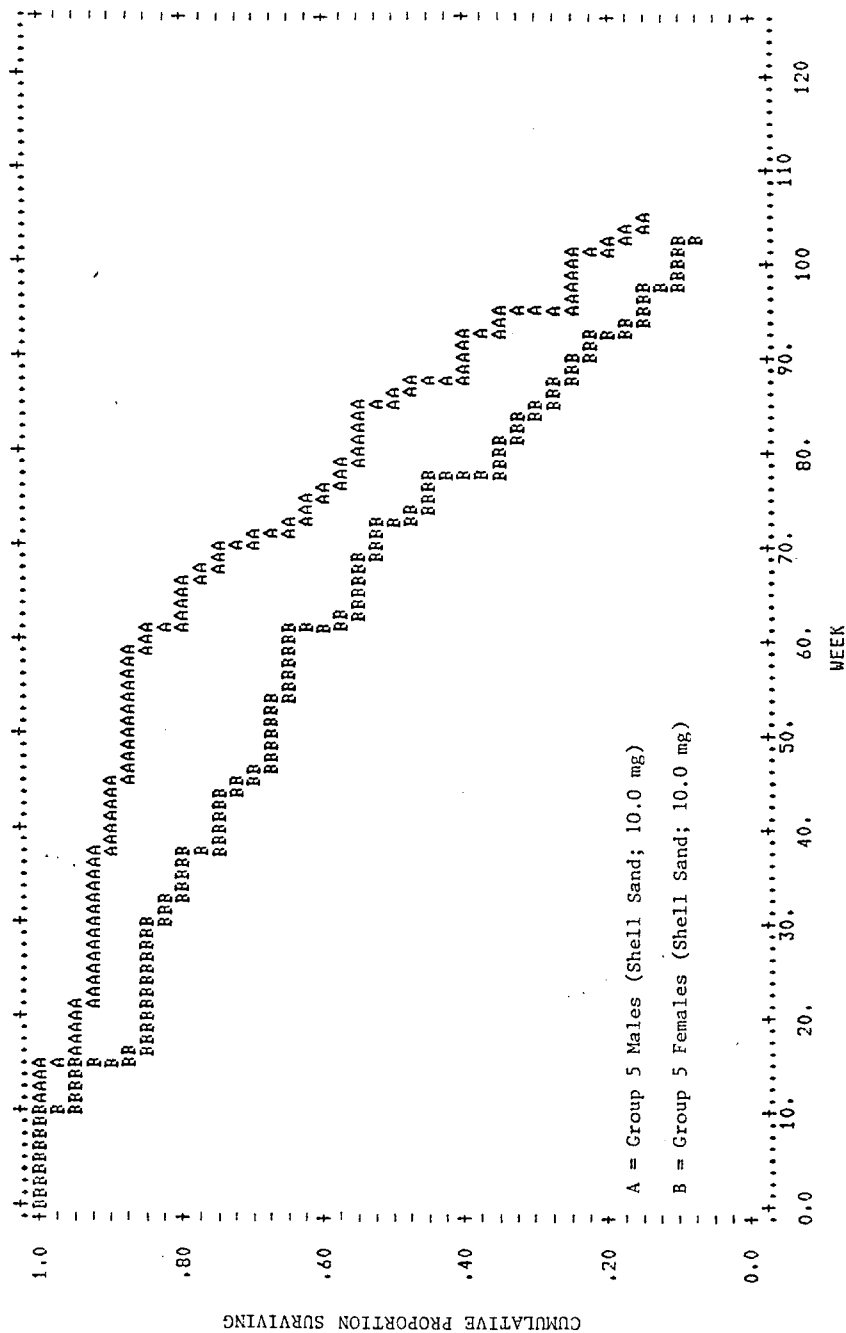
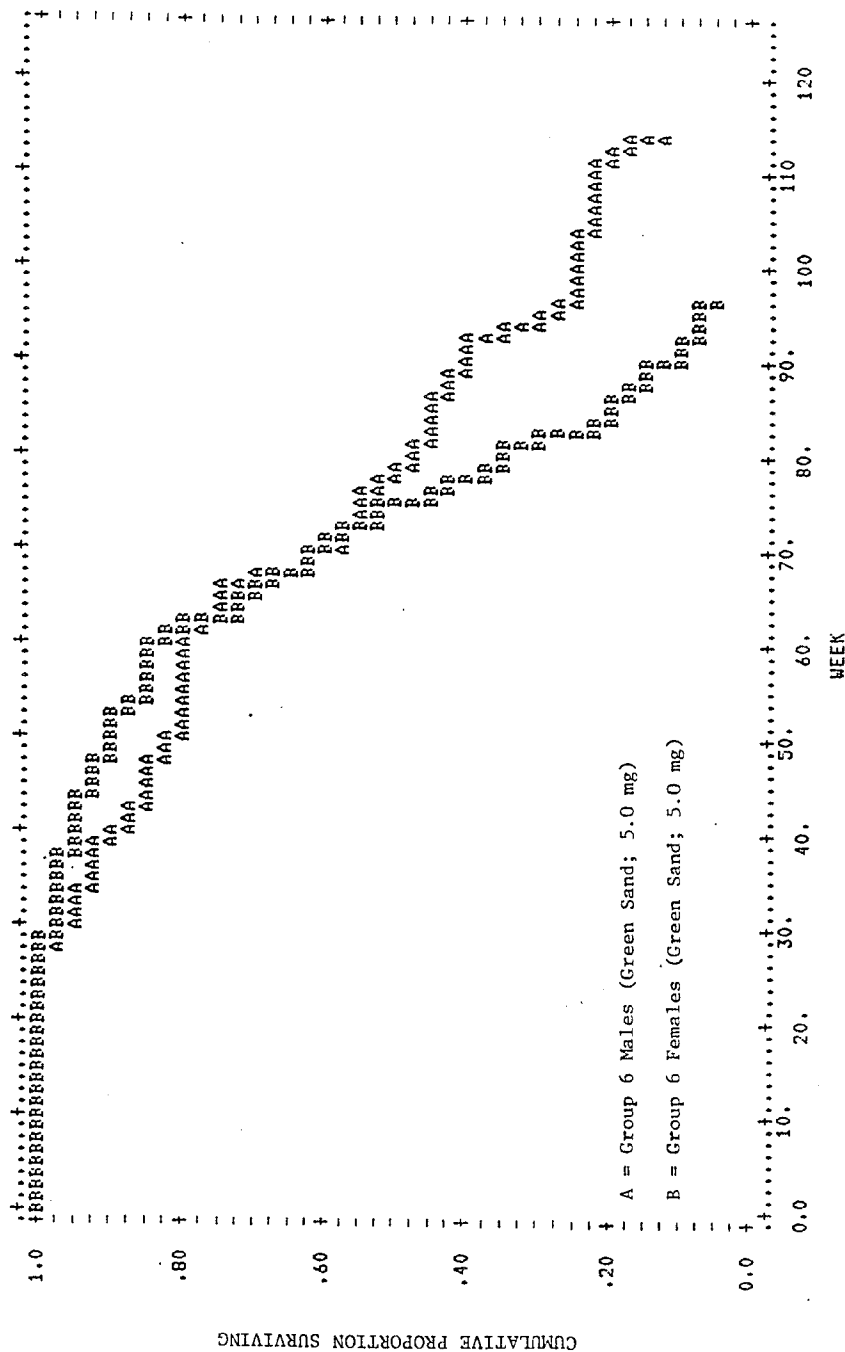


FIGURE 13C (Continued)
SURVIVAL
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUP 5 MALES vs GROUP 5 FEMALES



STATISTIC	D.F.	P-VALUE
GENERALIZED WILCOXON (BRESLOW)	1	0.0104
GENERALIZED SAVAGE (MANTEL-COX)	1	0.0187

FIGURE 13C (Continued)
SURVIVAL
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUP 6 MALES vs GROUP 6 FEMALES



	STATISTIC	D.F.	P-VALUE
GENERALIZED WILCOXON (BRESLOW)	1.510	1	0.2192
GENERALIZED SAVAGE (MANTEL-COX)	5.046	1	0.0247

FIGURE 13C (Continued)
SURVIVAL
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUP 8 MALES vs GROUP 8 FEMALES

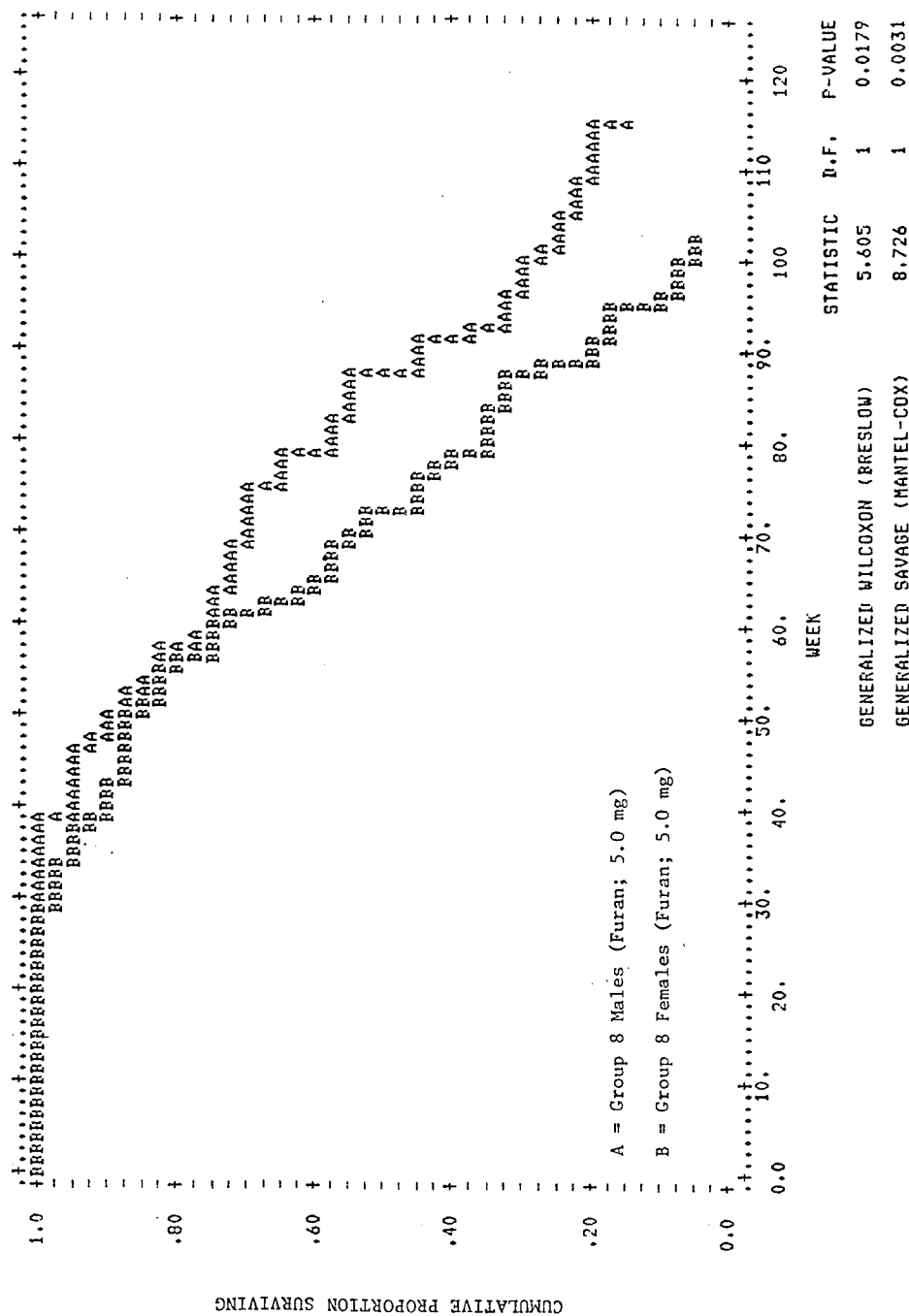


FIGURE 13C (Continued)
SURVIVAL
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUP 9 MALES vs GROUP 9 FEMALES

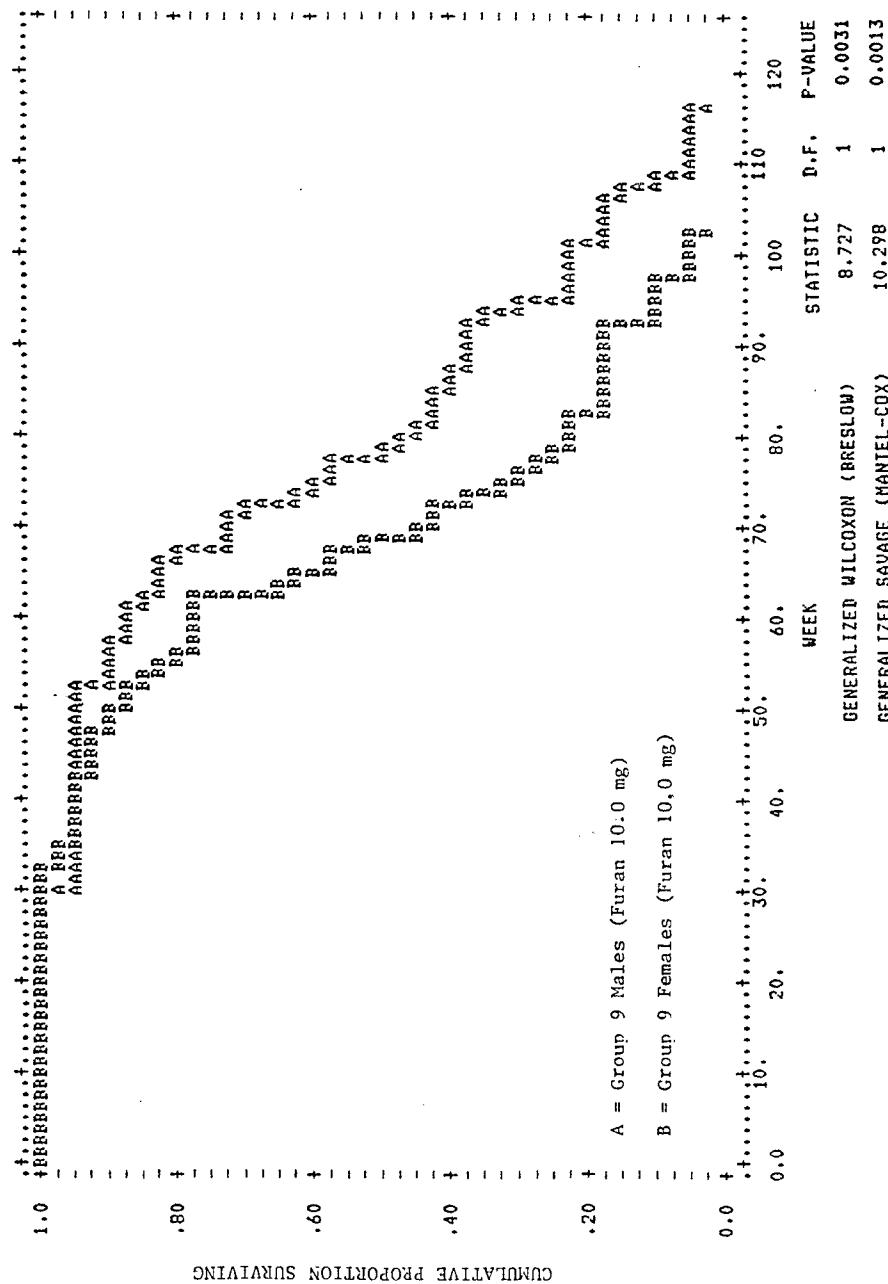
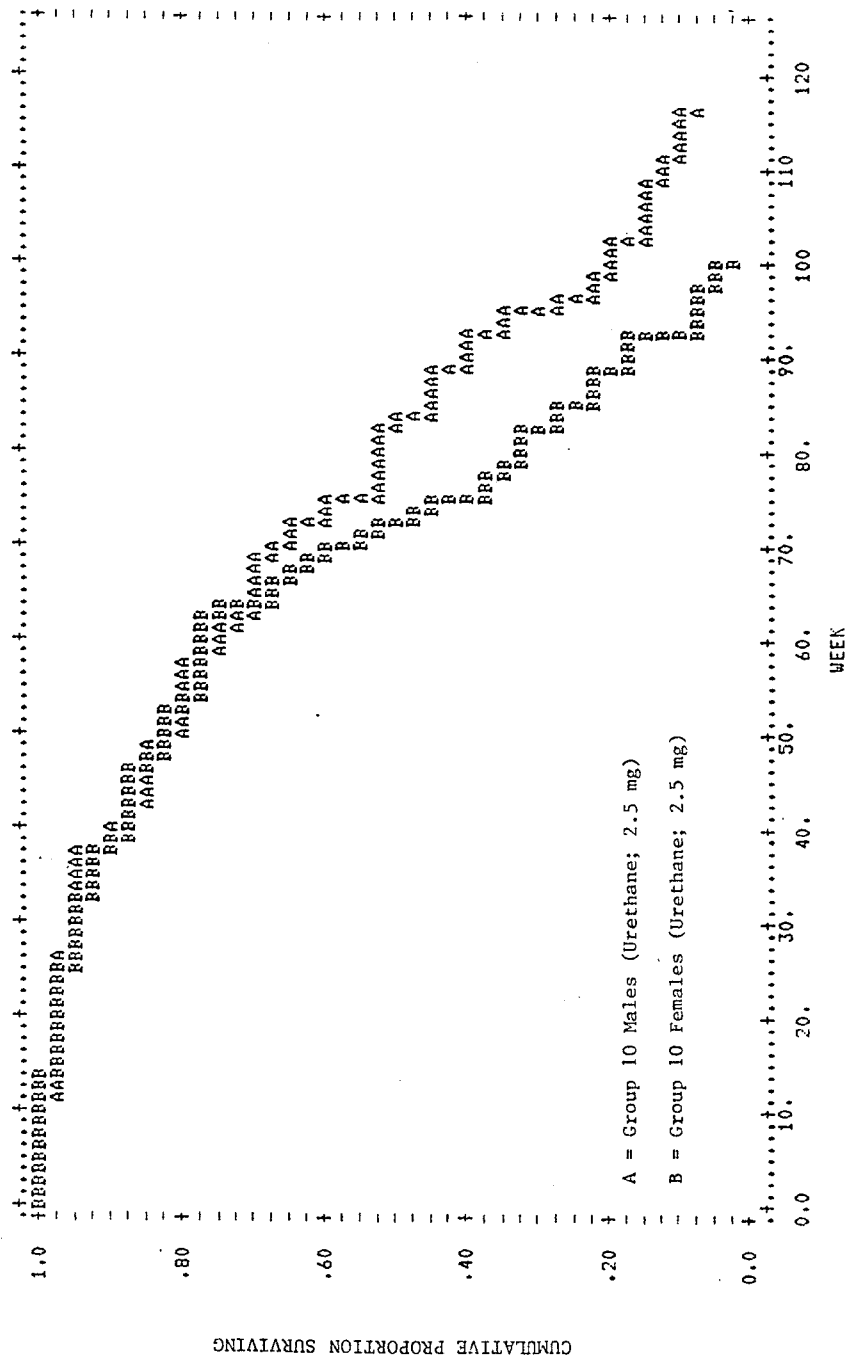


FIGURE 13C (Continued)
SURVIVAL
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUP 10 MALES vs GROUP 10 FEMALES



	STATISTIC	D.F.	P-VALUE
GENERALIZED WILCOXON (BRESLOW)	3.316	1	0.0686
GENERALIZED SAVAGE (MANTEL-COX)	7.702	1	0.0055

FIGURE 13C (Continued)
SURVIVAL
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUP 11 MALES VS GROUP 11 FEMALES

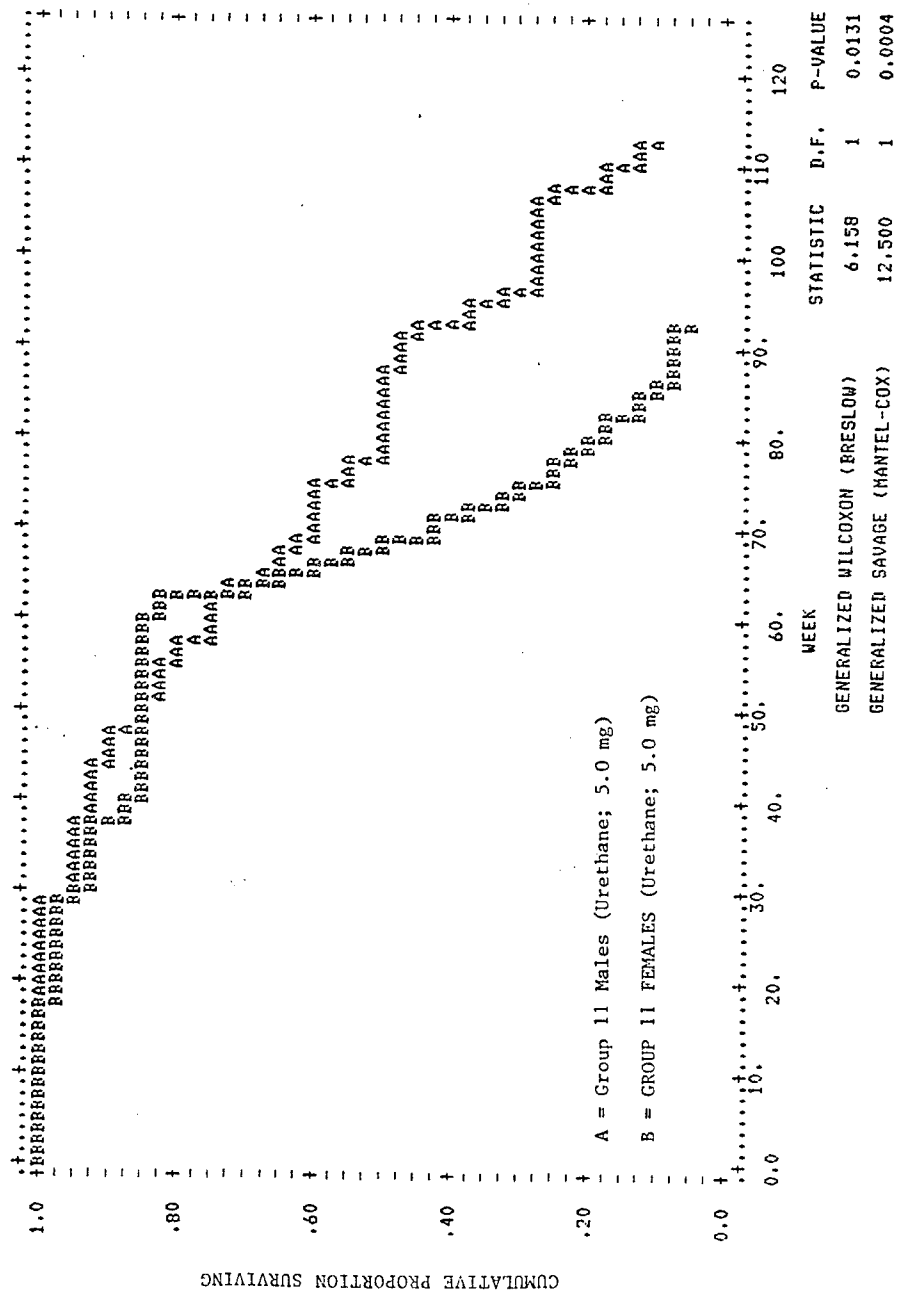


FIGURE 13D
SURVIVAL
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUPS 4, 6, 8 AND 10 MALES

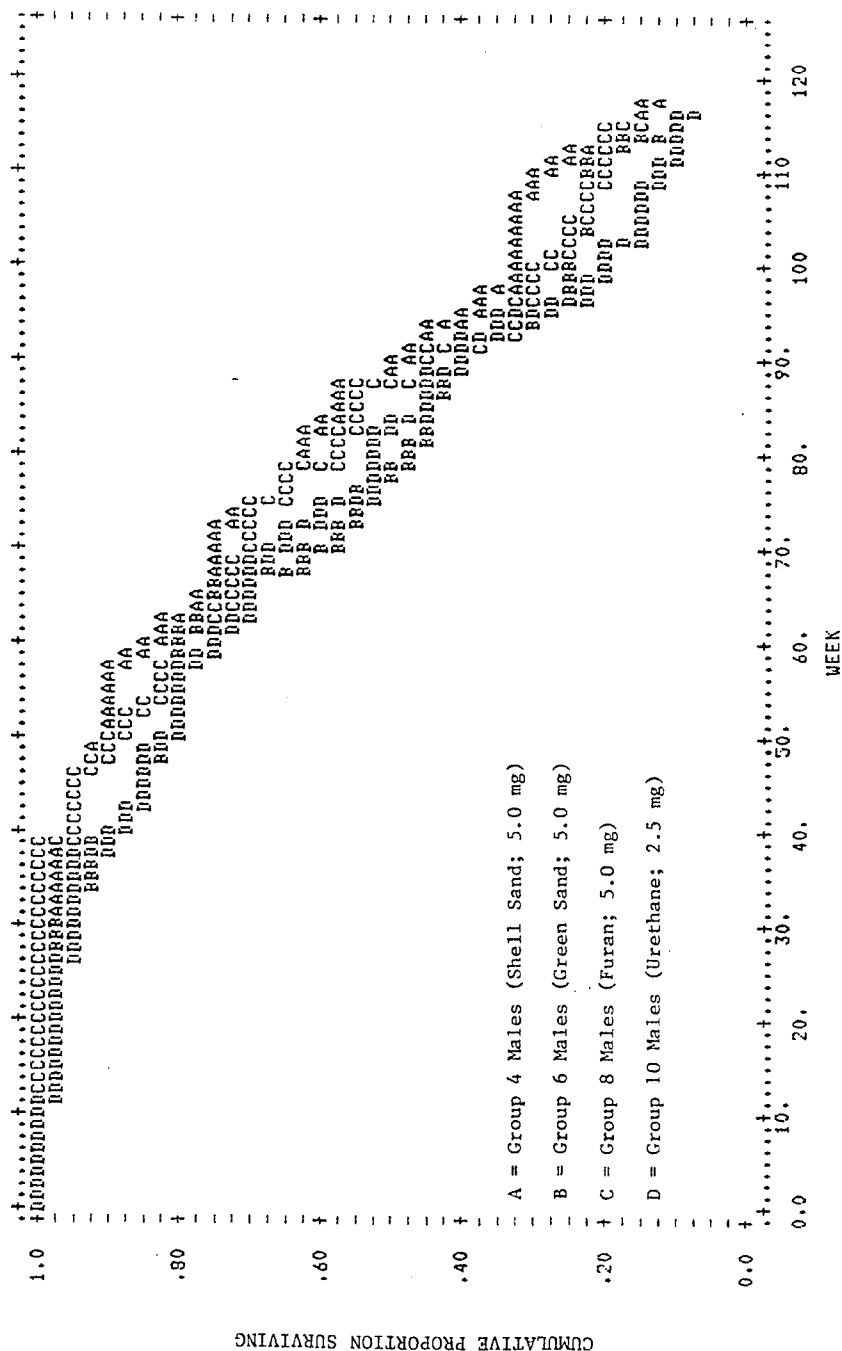


FIGURE 13D (Continued)
SURVIVAL
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUPS 4, 6, 8 AND 10 FEMALES

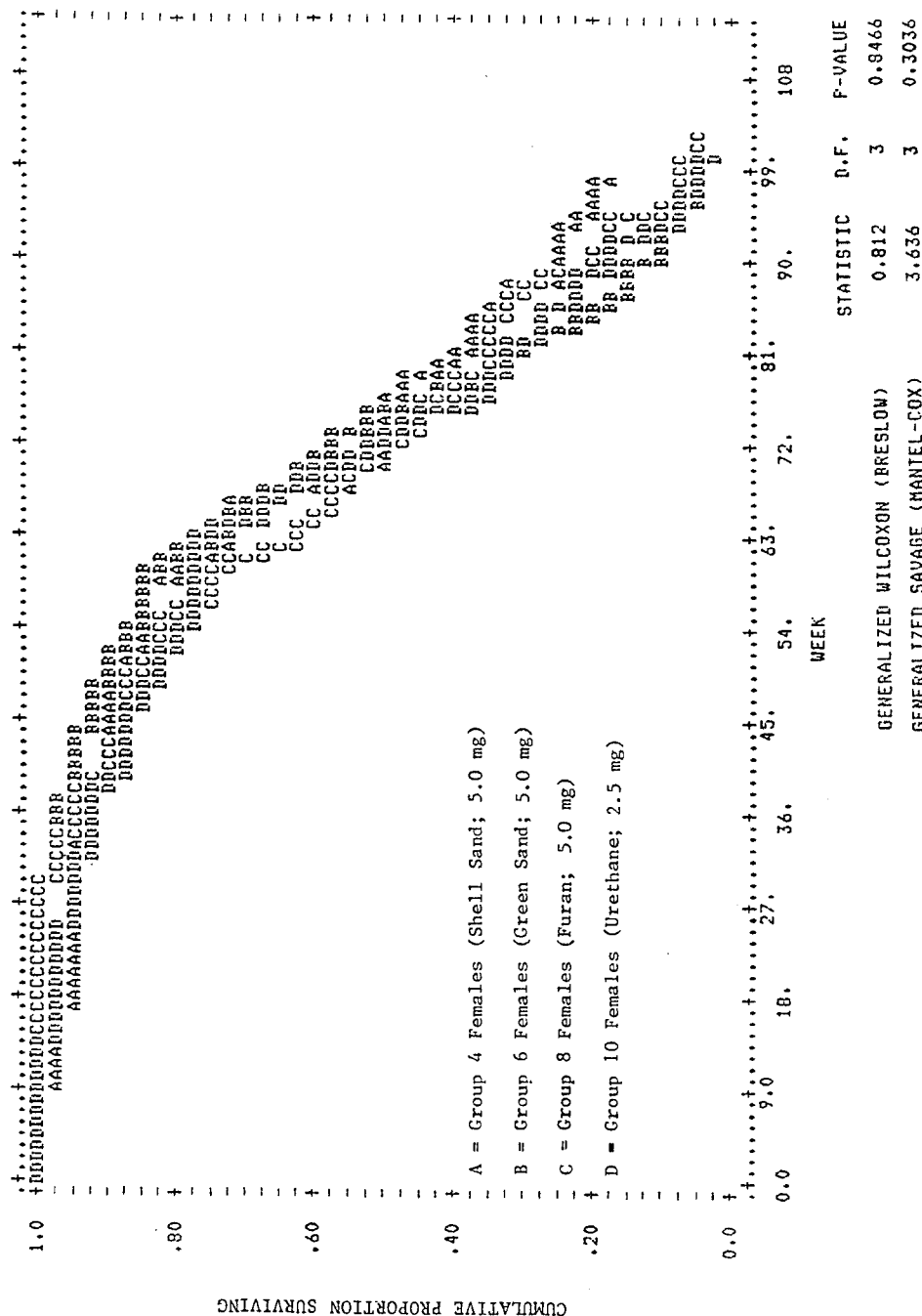


FIGURE 13D (Continued)

CUMULATIVE PROPORTION SURVIVING

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)

GROUPS 5, 7, 9 AND 11 MALES

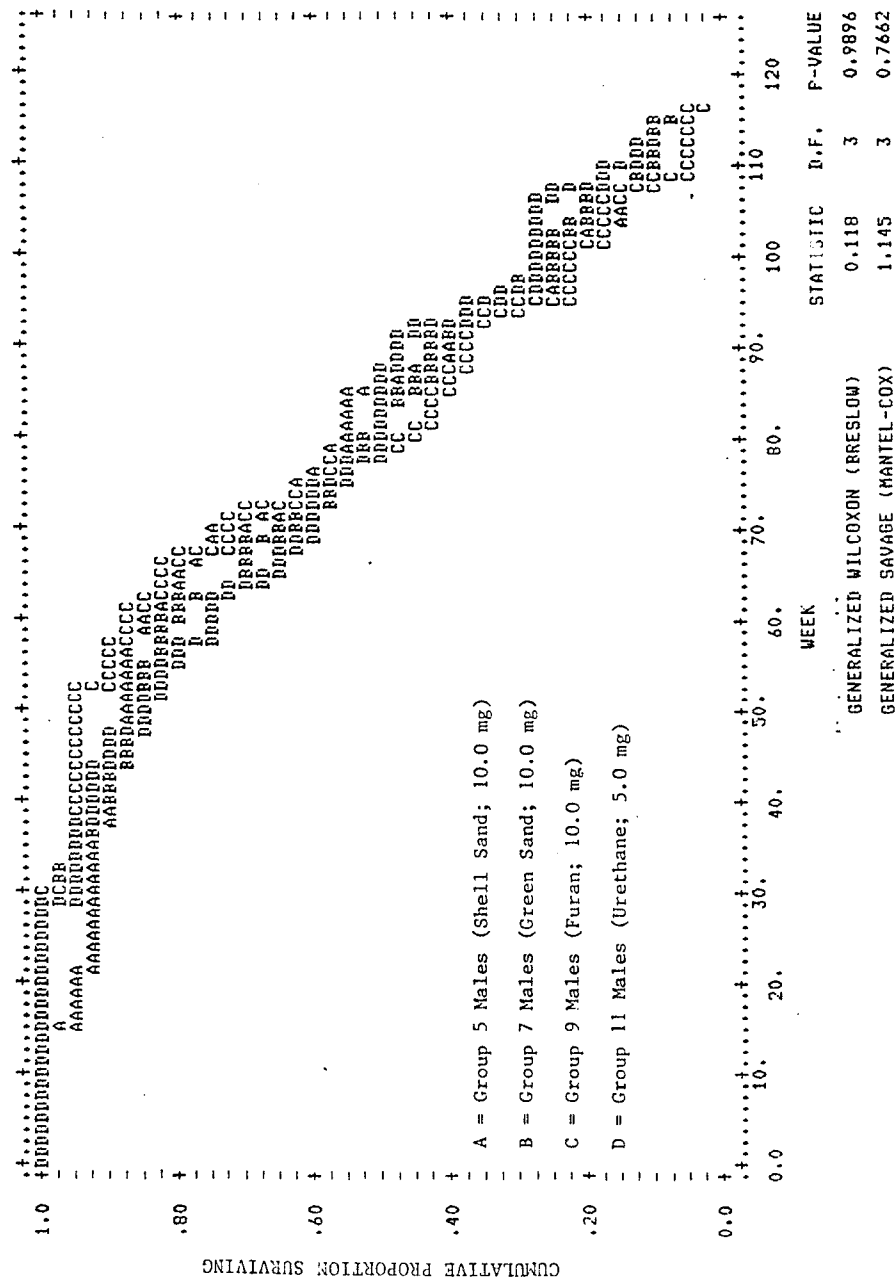


FIGURE 13D (Continued)
SURVIVAL
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
GROUPS 5, 7, 9 AND 11 FEMALES

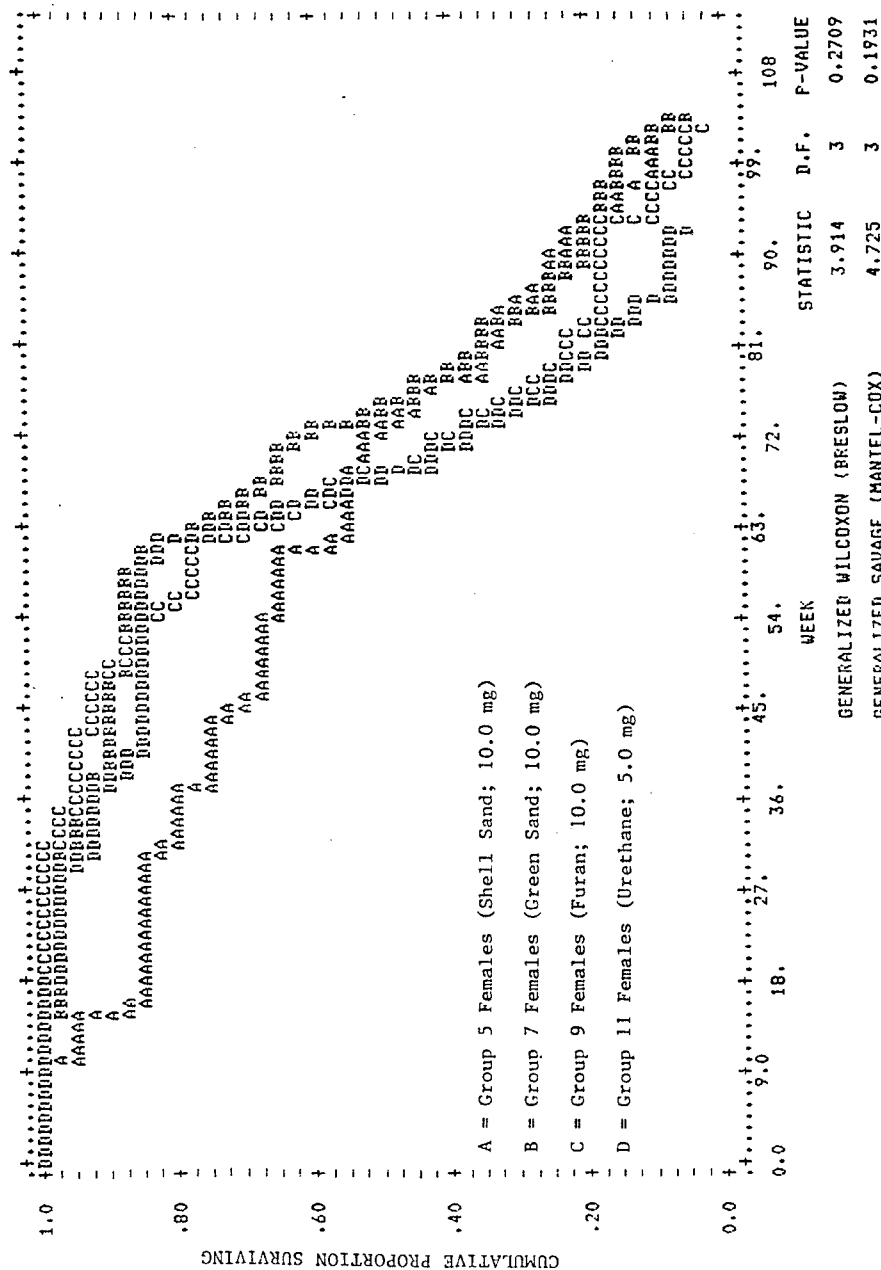


TABLE 18
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
KEY TO GROUP IDENTIFICATION

<u>GROUP NUMBER</u>	<u>TREATMENT</u>	<u>DOSE LEVEL (mg/0.2 ml distilled water)</u>
1	Vehicle Control	--
2	Ferric Oxide Control (Fe_2O_3 + Vehicle)	3.0
3	Positive Control (BaP + Fe_2O_3)	3.0 + 3.0
4	Shell Sand	5.0
5	Shell Sand	10.0
6	Green Sand	5.0
7	Green Sand	10.0
8	Furan	5.0
9	Furan	10.0
10	Urethane	2.5
11	Urethane	5.0

TABLE 18A

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Thin Alopecia					1			1			
					1			1			
Thin Alopecia					1			1			
					1			1			
Wheezing Dyspnea			2								
			2								
Wheezing Dyspnea			1								
			1								
Wheezing Dyspnea Polypnea		1	1								
		1	1								
		1									
Wheezing Dyspnea Polypnea		1	2								
		1	2								
		1									

^aGiven as number of animals per group in which each sign was observed during the designated week.

^bNo signs observed prior to Week 8.

TABLE 18A (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
MALES											
Week 14											
Wheezing											
Dyspnea			2								
			2								
Week 15											
Wheezing			2				1			1	2
Dyspnea			2				1			1	1
Thin							3			1	1
Fissuring, right testis			1								
Abscess, left testis										1	
Week 16											
Wheezing	1	4	6	8	6	4	3	7	5	3	8
Dyspnea	1	3	4	8	5	3	3	7	6	2	6
Polypnea		1	1	6	2	1	2	2	1	1	1
Thin			4				1	1		1	1
Sores, right testis							1				
Week 17											
Wheezing	4	2	9	9	11	10	11	12	14	9	12
Dyspnea	2	1	9	9	11	10	10	11	14	9	12
Polypnea			2	5	4	4	4	5	8	2	8
Thin		1	3			1	1	1	2	3	1
Distended abdomen		1									

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 18											
Wheezing	8	14	12	14	13	7	9	7	5	9	15
Dyspnea	3	14	11	11	13	7	9	7	5	8	15
Polypnea		3	2	4	7	2	4	2	1	2	6
Thin			4	1	1		3		1	1	2
Hunched					1						
Soft feces						1					
Week 19											
Wheezing	6	9	10	11	20	7	10	7	6	9	15
Dyspnea	4	9	10	9	18	7	10	7	6	8	15
Polypnea		5	3	3	12	2	5	2	1	2	6
Thin			2	2							1
Week 20											
Wheezing	6	9	10	12	18	7	10	8	9	9	15
Dyspnea	4	9	10	9	17	7	10	8	9	8	15
Polypnea		4	3	3	11	2	5	2	3	2	6
Thin						1					1

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)
 INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
 MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 21											
Wheezing	8	9	7	9	14	11	9	8	9	11	10
Dyspnea	3	9	6	9	12	8	9	8	9	10	9
Polypnea	1	2	3	6	5	3	2	2	3	2	3
Hunched	1		2	1							
Thin	1		3	1	1						1
Week 22											
Wheezing	12	10	14	13	18	11	14	13	16	14	12
Dyspnea	11	10	11	13	18	10	14	13	15	14	12
Polypnea	3	5	4	7	11	4	6	4	4	6	10
Hunched	1		1	1	1	1					
Thin	1		6	1	1	1	1			2	2
Week 23											
Wheezing	11	10	14	16	14	11	14	12	19	13	12
Dyspnea	10	10	12	16	14	11	14	12	18	12	12
Polypnea	3	5	5	8	6	6	9	3	7	5	2
Hunched	1		1	1	1						
Thin	1		4	1	1					1	

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)
 INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
 MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 24											
Wheezing	8	10	14	16	14	11	14	12	17	13	12
Dyspnea	4	10	13	16	14	11	14	12	16	13	12
Polypnea	1	3	5	8	6	6	9	5	5	5	4
Hunched	1	1	2	1	1						
Thin	1	1	4	1	1						
Week 25											
Wheezing	9	10	14	16	14	11	14	12	16	13	12
Dyspnea	4	10	13	16	14	11	14	12	15	13	12
Polypnea	1	4	5	8	6	6	9	6	5	5	5
Hunched			3		1				1	1	
Thin			4		1				1	1	
Week 26 ^b											
Wheezing				15	17	12	16	17	19	16	12
Dyspnea				16	17	12	16	17	18	15	12
Polypnea				9	6	6	8	6	6	5	4
Hunched				1	4	8	2	5	2	5	1
Thin				1	4	8	2	5	2	5	
Alopecia								1			1
Ataxia										1	

^aGiven as number of animals per group in which each sign was observed during the designated week.
^bWeek 26 data not available for Groups 1, 2, and 3, due to technical error.

TABLE 18A (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 27											
Wheezing	16	11	13	16	14	11	13	12	16	13	12
Dyspnea	14	11	13	16	14	11	13	12	15	13	12
Polypnea	8	4	5	8	7	8	9	6	4	4	7
Hunched	2	2	2		1						
Thin	1		2		1						
Soft feces	1										
Week 28											
Wheezing	16	11	12	16	16	13	14	12	16	12	13
Dyspnea	15	11	12	16	15	13	14	12	16	12	13
Polypnea	8	4	4	8	5	5	9	5	4	4	7
Hunched	1	2	1		4	3					
Thin			1		2						
Week 29											
Wheezing	16	11	11	17	16	13	15	12	16	12	13
Dyspnea	15	11	11	17	15	13	15	12	16	12	13
Polypnea	8	4	3	8	5	5	9	5	4	5	7
Hunched					4	3	1			1	
Thin					3	1				1	

^a Given as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
MALES											
Week 30											
Wheezing	7	8	12	20	21	14	18	19	23	20	13
Dyspnea	6	8	12	21	21	14	18	19	22	20	13
Polypnea	1			12	8	8	12	8	8	7	6
Hunched	2	2	5	4	5	8	3	6	5	8	4
Thin	1	2	5	2	4	8	3	6	5	8	3
Soft feces	1				1		1				1
Alopecia								1			
Week 31											
Wheezing	17	14	11	17	16	13	15	13	16	12	13
Dyspnea	15	14	11	17	15	13	15	13	16	12	13
Polypnea	8	4	3	8	5	4	10	6	4	5	7
Hunched			2		3	3	1		1	1	
Thin			2		3	1				1	
Alopecia								1			
Week 32											
Wheezing	18	14	11	18	16	15	15	12	16	12	13
Dyspnea	17	14	11	17	15	15	15	12	16	12	13
Polypnea	7	5	3	8	5	5	10	5	4	4	6
Hunched			2		2	3	3	1	1	3	2
Thin			2		1	2	1	1		3	2
Alopecia											

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
MALES											
Week 33											
Wheezing	18	14	11	18	16	14	14	12	16	12	13
Dyspnea	17	14	11	18	15	14	14	12	16	12	13
Polypnea	7	5	3	9	5	5	8	5	5	4	6
Hunched	2	3	2	1	3	5	3	1		2	2
Thin	2	3	2		3	3	2	1		2	2
Alopecia							1	1			
Soft feces					1						
Week 34											
Wheezing	9	9	13	21	22	15	16	19	21	21	13
Dyspnea	8	9	13	22	22	15	16	19	20	21	13
Polypnea	1		2	12	8	9	11	8	7	7	6
Hunched	4	3	5	7	6	10	3	7	3	9	5
Thin	1	2	5	2	4	9	3	6	4	9	3
Ataxia			1								
Soft feces					1						
Alopecia							1	1			1
Week 35											
Wheezing	18	13	12	18	16	12	14	12	16	12	14
Dyspnea	17	13	12	18	15	12	14	12	16	12	13
Polypnea	6	5	3	8	6	2	5	5	5	4	6
Hunched	1	1	4	2	3	4	2	1	1	2	2
Thin	1	1	3	1	2		1			1	
Squinted eyes						1					
Alopecia							1				

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)
 INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
 MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 36											
Wheezing	18	13	12	18	16	12	14	12	16	12	14
Dyspnea	17	13	12	18	15	12	14	12	16	12	13
Polypnea	6	5	3	8	6	2	5	5	5	4	6
Hunched	1	1	4	4	4	4	2	1		1	2
Thin	1	1		3	3		1				1
Squinted eyes						1					
Atlopecia							1	1			
Week 37											
Wheezing	18	13	12	19	16	12	14	13	16	14	17
Dyspnea	17	13	11	18	16	12	14	12	16	13	16
Polypnea	6	5	3	7	6	1	5	5	5	3	6
Hunched	1	3	4	8	4	3	2	10	5	5	13
Thin	1	3	2	4	3	1	2	8	3	3	9
Enlarged abdomen											
Squinted eyes				1		1		2			
Paralysis					1						
Lethargy					1						
Atlopecia							1	1			1

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
MALES											
Week 38											
Wheezing	15	12	11	25	23	11	14	13	16	20	17
Dyspnea	13	12	11	26	23	11	14	13	16	20	17
Polypnea	2	4	3	13	8	5	4	6	7	7	8
Hunched	4	5	5	8	6	6	2	5	2	15	7
Thin		3	5	2	4	8	2	5	2	12	6
Squinted eyes					1	1					1
Tilted head						1					
Lethargy						1	1	1		1	1
Alopecia											1
Prostrate											1
Soft feces					1						
Tissue mass, penis					1						
Enlarged abdomen		1			1						
Week 39											
Wheezing	18	15	12	20	17	13	19	16	18	14	16
Dyspnea	16	15	11	18	17	13	16	15	18	14	13
Polypnea	6	8	7	8	7	1	3	5	7	4	6
Hunched	3	6	5	3	4	8	5	6	6	3	5
Thin	2	4	3	1	2	2	3	6	5	1	4
Prostrate		1									
Squinted eyes						1		2	1		
Alopecia							3	1	1		

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 40											
Wheezing	14	17	13	18	23	14	16	17	12	11	14
Dyspnea	13	15	13	17	21	13	16	17	11	11	14
Polypnea	4	10	5	6	3	2	6	5	3	3	6
Hunched	6	5	11	4	2	9	4	13	8	12	11
Thin	3	1	5	2	1	1	3	4	1	3	5
Alopecia					2	2	2	1			
Ataxia						1				2	
Soft feces							1		1		
Week 41											
Wheezing	17	15	12	19	14	9	15	16	15	12	15
Dyspnea	16	15	12	18	13	9	15	14	15	11	14
Polypnea	6	2	4	4	3	2	1		1	1	1
Hunched	9	2	5	4	3	9	4	6	13	6	3
Thin	3		3	1	2	2	1		8	2	
Soft feces	1										
Alopecia							1	1			
Ataxia										1	

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 42											
Wheezing	16	17	13	24	21	13	16	17	17	21	19
Dyspnea	13	12	12	26	22	10	14	13	16	19	18
Polypnea	10	7	3	13	7	4	4	6	7	7	8
Hunched	3	5	6	5	3	6	2	5	5	8	7
Thin		2	5	1	2	6	1	5	2	11	5
Soft feces					2			1	1	1	
Squinted eyes						1					1
Alopecia							1	1			1
Lethargy										1	
Prostrate											
Enlarged abdomen		1									1
Week 43											
Wheezing	16	19	11	13	14	6	16	13	12	15	16
Dyspnea	16	19	11	13	13	6	16	13	12	14	16
Polypnea	6	2	4	5		1	3	3	2		1
Hunched	9	5	5	4		3	6	10	12	4	7
Thin	2	2	3			1	4	6	5	3	
Lethargy	1										
Enlarged abdomen		1									
Alopecia							1	1			
Soft feces									2		
Squinted eyes									1		
Ataxia										1	

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
MALES											
Week 44											
Wheezing	16	19	11	24	19	17	16	19	13	16	18
Dyspnea	16	19	11	24	19	17	16	19	13	16	18
Polypnea	3	2	1		3	3	2				1
Hunched	2	2	2		1		3	6	7	5	8
Thin							1	2		1	3
Soft feces	1										
Ataxia			1				1			1	
Alopecia							1	1			
Week 45											
Wheezing	16	16	7	17	14	13	16	17	17	17	18
Dyspnea	16	16	7	17	14	13	16	17	17	17	18
Polypnea	4	1	1	2	1	1		2	2		1
Hunched	8	9	7	5	3	4	2	8	9	3	5
Thin	3	4	4	3	1	3		4	3	1	3
Soft feces	1										
Enlarged abdomen					1						
Small tissue mass, neck					1						
Alopecia							1	1			
Ataxia								2	1	1	1

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

		INCIDENCE OF SIGNS ^a										
		GROUP										
		1	2	3	4	5	6	7	8	9	10	11
MALES												
Week 46												
Wheezing	17	17	9	22	18	12	17	15	19	21	19	
Dyspnea	14	15	9	25	20	12	16	17	18	20	19	
Polypnea	11	7	3	13	7	4	7	6	7	7	9	
Hunched	1	5	4	2	1	2	1	5	6	6	4	
Thin		3	3	1	1	4		5	2	7	4	
Soft feces	1				1	1		1				
Ataxia			2					1				
Squinted eyes						1					1	
Alopecia							1	1				
Prostrate												1
Week 47												
Wheezing	18	17	11	20	13	15	15	16	17	15	17	
Dyspnea	18	17	11	20	13	15	15	16	17	15	17	
Polypnea		2	1	1		1	2	2	1		1	
Hunched	1	2	4		1	3	2	11	4	3	4	
Thin			4			2	2	9	2			
Soft feces	1											
Ataxia						1		1	1		1	
Alopecia			1				1	1				1

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 48											
Wheezing	18	19	9	19	12	14	19	19	16	17	15
Dyspnea	18	19	9	19	12	14	19	19	16	17	15
Polypnea		1	2	1				1		1	1
Hunched	2		2	1	2	3	3	7	5	2	3
Thin			2		1			2	2		
Soft feces	1			1				1			
Enlarged abdomen		1									
Ataxia			1					1	1		
Enlarged, left testis			1								
Alopecia							1	1			1
Week 49											
Wheezing	17	21	10	18	15	16	14	17	15	20	16
Dyspnea	17	21	10	18	15	16	14	17	15	20	16
Polypnea	1	3	1	1	2	1	1	2	1	3	1
Hunched	1		1	1	2	3		6	4	3	2
Thin					2	2		2	2		
Ataxia					1	2		2	1		
Alopecia							1	1			1
Soft feces					1			1			

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
MALES											
	Week 50										
Wheezing	18	19	8	19	14	13	15	14	20	22	17
Dyspnea	15	16	6	23	19	13	15	15	19	19	17
Polypnea	14	8	4	13	8	4	9	10	7	6	7
Hunched	1	5		1	2	2		6	8	5	4
Thin		5	1		1	1		2	2	6	2
Ataxia					1						
Soft feces					2						
Squinted eyes						1					
Alopecia							1	1			
Soiled anal area									1		
	Week 51										
Wheezing	16	16	14	17	18	19	14	15	14	17	10
Dyspnea	16	16	14	17	18	19	14	15	14	17	10
Polypnea	2	4	1	3	3	3	2	2	2		1
Hunched	2	1	4	1	1	2		6	7	2	4
Thin	1	1	2			1		5	3		1
Ataxia	1					1		1			
Alopecia			1				1	1			1
Soft feces					1						

^a Given as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 52											
Wheezing	15	17	8	17	15	11	11	15	18	15	17
Dyspnea	15	17	8	17	15	11	11	15	18	15	17
Polypnea	3	1	1	1	3		1	2	1	2	3
Hunched	4	3	1		4	2		3	3	3	5
Thin	1	1	1		4	1		1	2		2
Alopecia							1	1			1
Ataxia					2			1			2
Soft feces					1			1			1
Week 53											
Wheezing	15	18	8	17	14	13	15	16	18	12	15
Dyspnea	15	18	8	17	14	13	15	16	18	12	15
Polypnea	1	2	1	1	3	1	2	1	1		3
Hunched	3	1	3	3	2	2	1	4	2	2	6
Thin	1		1		2			1	1	1	3
Alopecia							1				1
Ataxia		1	1		2			1			1
Soft feces					1						
Squinted eyes											1

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
MALES											
Week 54											
Wheezing	15	21	7	21	17	14	15	16	21	23	16
Dyspnea	14	19	7	22	17	14	15	14	20	23	17
Polypnea	11	11	4	15	9	4	9	10	9	7	8
Hunched	6	5	2	2	2	3	5	5	10	7	6
Thin		3			1	1		2	2	7	2
Ataxia	1		1		1			1		1	
Soft feces					3		1				
Squinted eyes							1				
Alopecia											
Enlarged abdomen	1										
Week 55											
Wheezing	17	19	7	19	18	14	17	16	17	15	15
Dyspnea	17	19	7	19	18	14	17	16	17	15	15
Polypnea	2	1	1	3	1		2	1	1	1	1
Hunched	3	4	3	2	3	1		2	4	3	5
Thin	2	1			2	1				1	2
Enlarged abdomen		1						1			
Ataxia						1					1
Alopecia							1				1

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 56 ^b											
Wheezing	16	15	5	21	15	17					
Dyspnea	16	15	5	21	15	17					
Polypnea	4			1	1						
Hunched	3	3		3	6	1					
Thin				1	2	1					
Enlarged abdomen		1									
Soft feces						1					
Week 57											
Wheezing	18	22	8	19	14	13	20	16	12	16	17
Dyspnea	18	22	8	19	14	13	20	16	12	16	17
Polypnea	3			2	1		1				2
Hunched	1	1	1	1	3	3	1	1	1		2
Thin		1	1	1	1	1	1				1
Soft feces					2						
Sores, anus						1					
Enlarged abdomen								1			1
Alopecia									1		

^a Given as number of animals per group in which each sign was observed during the designated week.
^b Week 56 observations inadvertently not recorded for Groups 7 through 11.

TABLE 18A (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 58											
Wheezing	14	21	6	22	18	14	15	14	18	22	17
Dyspnea	14	21	4	22	19	14	15	14	20	22	16
Polypnea	10	11	3	15	8	4	9	9	8	7	8
Hunched	4	1	1	3	3	5	5	2	4	1	7
Thin	1	3			1	2		1	1	5	1
Squinted eyes						1					
Alopecia						1	1		1		1
Enlarged abdomen		1									
Week 59											
Wheezing	16	17	9	19	16	11	10	16	14	16	18
Dyspnea	16	17	9	19	16	11	10	16	14	16	18
Polypnea	3	3	1	1	2	7	4		3	2	1
Hunched	1	1	3	1	2	3			1	4	3
Thin		1			1		1			1	
Enlarged abdomen/body											
Ataxia			1		1						
Alopecia							1				
Soft feces	1				1	1					

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 60											
Wheezing	14	19	11	17	19	8	8	17	21	13	11
Dyspnea	11	19	11	17	19	8	8	17	21	13	11
Polypnea	1	2	1	2	3	5	4		2	3	3
Hunched	2	1	1		2	3	2		2	1	1
Thin		1									
Enlarged abdomen	3			1	2	1					
Soft feces							2				
Alopecia							1				
Swollen body											
Squinted eyes			1	1	2						
Lethargy		1									
Ataxia		1			1						
Week 61											
Wheezing	18	21	11	20	17	6	7	9	11	8	12
Dyspnea	18	21	11	20	17	6	7	9	11	8	12
Polypnea	2	3	1		3	5	5		2	1	3
Hunched	2	3			2	3	4		2		
Thin						1					
Soft feces						1					
Alopecia						1	2		2		
Squinted eyes			1		2	1					
Ataxia					2	1					
Lethargy					2						

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)
 INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
 MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 62											
Wheezing	12	21	4	20	17	13	13	14	20	17	17
Dyspnea	12	20	3	20	17	14	13	14	20	17	17
Polypnea	9	12	1	15	8	4	10	7	9	5	8
Hunched	4	1	2		3	3	6	2	6		6
Thin	1	2			1	2	2		1	2	1
Ataxia		1	1						1		
Enlarged abdomen		1		1							
Squinted eyes						1					
Alopecia							1				1
Soft feces	1										

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 63											
Wheezing	13	13	4	13	7	7	9	6	5	3	6
Dyspnea	13	13	4	13	7	7	8	6	5	3	6
Polypnea	1	1		1	1	1	2	1			
Hunched	4	4	5	3	10	6	6	2	7	3	5
Thin	1	2	2		3	3	3	1	2		3
Obese					1	1	1				
Alopecia		1			1	1					1
Ataxia		1					1	1			
Enlarged abdomen							1	1			
Soft feces					1	1	1		1		
Week 64											
Wheezing	7	10	3	8	4	5	7	6	8	5	5
Dyspnea	7	10	3	8	3	5	7	6	8	5	5
Polypnea		4	1		1		1		1		1
Hunched	5	3	4	3	6	5	2	3	6	3	2
Thin	2	1	4	1	2	2	1		2	1	2
Ataxia		1	1							3	3
Alopecia					2	1		1			1
Soft feces					2					1	
Circling	1										
Obese						1					

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 65											
Wheezing	8	11	3	7	1	5	7	5	10	6	7
Dyspnea	8	11	3	7	1	5	7	5	10	6	7
Polypnea	1			3			2	1	1		
Hunched	5	2	3	3	5	4	2	3	11	3	1
Thin	2		3	1	3	2	1	1			
Soft feces	1				2	1					
Alopecia					1						1
Obese						1					
Ataxia			1	1			1				
Sores											1
Soiled anal area											1
Week 66											
Wheezing	10	16	3	20	15	8	11	10	17	14	15
Dyspnea	12	20	2	20	17	11	12	14	18	17	14
Polypnea	9	11		15	8	3	9	7	8	5	7
Hunched	2	2	1		5	4	3	3	11		4
Thin	1	1	1		2	1	3		2	1	
Soft feces	1										
Alopecia						1					1
Squinted eyes						1					
Enlarged abdomen		1									

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 67											
Wheezing	8	5	1	5	2	7	7	5	9	5	4
Dyspnea	8	5	1	5	2	7	7	5	9	5	3
Polypnea	2			2			2				
Hunched	2	3	2	2	5	3	2	4	8	3	4
Thin	1		1	1	3	3	2	1	6	2	2
Alopecia				1	1	1					
Ataxia						1					
Enlarged abdomen						1		1			
Squinted eyes						1	1				
Week 68											
Wheezing	6	10		9	2	5	8	5	8	5	4
Dyspnea	6	10		9	2	5	8	5	8	5	4
Polypnea				1			1				
Hunched	2	2	3	5	4	3	2	3	12	5	1
Thin	1	2		1	2	2	2		7	1	1
Ataxia						1					1
Alopecia					1						
Soft feces									1		
Enlarged abdomen									1		
Squinted eyes							1				

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	I	2	3	4	5	6	7	8	9	10	11
Week 69											
Wheezing	5	5		9	3	3	10	5	3	4	6
Dyspnea	5	4		9	3	3	9	5	3	4	6
Polypnea					1						
Hunched	3	4	3	3	4	3	3	1	7	3	1
Thin	1	2		1	2	2		1	5	1	1
Enlarged abdomen					1				1	1	
Alopecia							1				1
Squinted eyes											
Soft feces							1				
Week 70											
Wheezing	8	16	2	19	12	4	8	10	16	11	14
Dyspnea	8	20	2	19	13	6	8	12	16	12	13
Polypnea	5	11		13	6	2	7	7	8	5	6
Hunched	2	4	1	2	5	5	2	4	9		5
Thin	1	1			2	1	1		1		
Alopecia						2					
Enlarged abdomen		1							1		

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
MALES											
Week 71											
Wheezing	2	4		6	5	3	6	5	13	6	6
Dyspnea	2	4		6	5	3	6	5	13	6	6
Polypnea			3	1			2		2		
Hunched	2	2	2	1	2	3	6	4	4	3	2
Thin						2		1	3		1
Alopecia						1					
Ataxia								1			
Enlarged abdomen					1	1				1	
Soft feces						1					
Week 72											
Wheezing	7	5		6	3	5	6	4	6	3	5
Dyspnea	7	5		6	3	5	6	4	6	3	5
Polypnea							1				
Hunched	1	2	2	4	3	5	2	6	4	1	
Thin		1		1		2	1	1	3	1	
Ataxia						1					
Alopecia								1			
Soft feces								1			
Enlarged abdomen					1				2	2	
Tissue mass, chest									1		

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)
 INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
 MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 73											
Wheezing	8	9		4	3	6	7	7	5	5	7
Dyspnea	8	9		4	3	6	7	7	5	5	7
Hunched	4	3	2	4	2	3	4	4	4	2	
Thin		2	2	1	1	1	2	1			
Ataxia		1									
Enlarged abdomen		1			1				1		
Tissue mass, chest										1	
Week 74											
Wheezing	11	16	1	23	14	7	8	10	15	11	12
Dyspnea	10	19	1	25	15	9	8	12	15	11	12
Polypnea	4	9		14	6	2	7	5	8	4	6
Hunched	2	4		2	4	1	1	3	6	1	3
Thin	2	2		3	2		1		1		
Alopecia										1	
Enlarged abdomen		1							1		
Squinted eyes	1										

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)
 INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
 MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 75											
Wheezing	6	7		3	3	3	5	3	5	7	6
Dyspnea	6	7		3	3	3	5	3	5	7	5
Polypnea							1				
Hunched	6	4	3	4	2	2	3	4	1	5	4
Thin	2	3	3	2		2		3	1	3	1
Alopecia						1			1		
Ataxia		1	2	1						1	
Enlarged abdomen						1	1	1	1		
Bleeding/bloody, penis		1						1		1	
Week 76											
Wheezing	4	6		6	3	1	5	6	5	3	4
Dyspnea	4	6		6	3	1	5	6	5	3	4
Polypnea							1				
Hunched	5	3		1	2	1	2	3	5	3	1
Thin	1	1				1			1	1	
Alopecia						1			1		
Enlarged abdomen										2	

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 77											
Wheezing	6	8		7	2	3	3	7	3	5	4
Dyspnea	6	8		7	2	3	3	7	3	5	4
Polypnea							1				
Hunched	4	2	1	1	1	1	1		3	1	1
Thin	1	1	1	1						1	
Enlarged abdomen											
Soft feces		1							2		
Week 78											
Wheezing	11	16		21	14	7	7	8	14	9	10
Dyspnea	10	19		22	15	9	7	10	14	9	10
Polypnea	3	8		13	5	2	6	5	8	3	5
Hunched	2	2		3	3	2		2	5	1	2
Thin	2	1		1	2		1				
Ataxia		1									
Alopecia	1								1		
Soft feces											1
Enlarged abdomen		1							1		
Squinted eye(s)	1										

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18A (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 79 ^b											
Wheezing	6	7		9	4	3	4	4	3	3	4
Dyspnea	6	6		9	4	3	4	4	3	3	4
Hunched	2	3		4	2	3	1		4	2	
Thin	1			2	1	2			4		
Enlarged abdomen									1	1	
Week 80 ^b											
Wheezing	9	7		6	5	4	5	8	3	3	5
Dyspnea	9	7		6	5	4	5	8	3	3	5
Hunched	5	4		1	2	3		1	3	5	4
Thin	3	1		1	1			1	1	1	
Alopecia		1						1			
Ataxia	1					1					
Enlarged abdomen	1						1		1		
Soft feces							1				

^aGiven as number of animals per group in which each sign was observed during the designated week.

^bNo pharmacotoxic signs were observed in the single surviving Group 3 male during Weeks 79 and 80.

TABLE 18A (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

PHARMACOTOXIC SIGN	MALES										
	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 81 ^b											
Wheezing		6		2		5	5	4	2	2	3
Dyspnea	5	6		2		5	5	4	2	2	3
Hunched	1	1		3	3	4	1	1	1	5	2
Thin	1				1					1	1
Alopecia					1						
Enlarged abdomen					1			1			
Week 82											
Wheezing	8	13		19	14	5	7	8	12	9	9
Dyspnea	9	16		20	15	7	7	9	12	9	9
Polypnea	2	6		11	5	2	6	5	8	3	5
Hunched	1	3		6	3	4	1	2	4	1	1
Thin	1	1			1						
Ataxia	1										
Enlarged abdomen		1			1			1	1		
Squinted eye(s)	1										

^aGiven as number of animals per group in which sign was observed during the designated week.

^bAll Group 3 males were dead as of Week 81.

TABLE 18A (Continued).
 INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
 MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 83											
Wheezing	2	6		2	2	1	5	2	5	4	4
Dyspnea	2	6		2	2	1	5	2	5	4	4
Hunched	2	2		1	4	4	2	2	3	3	2
Thin		2					1	2	1	2	
Alopecia	1										
Enlarged abdomen					1			1	1	1	
Tissue mass, jaw						1					
Squinted eyes										1	
Week 84											
Wheezing	1	6		5	2	1	6	4	6	1	4
Dyspnea	1	5		5	2	1	6	4	6	1	4
Polypnea							1				
Hunched	1	1		2	6	2	3	6	2	4	2
Thin					1	1		3	1	3	1
Ataxia									1		
Enlarged abdomen					1				1		
Tissue mass, jaw						1					
Soft feces										1	

^aGiven as number of animals per group in which each sign was observed during the designated week.

Note: All Group 3 males were dead as of Week 81

TABLE 18A (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 85											
Ataxia							2				
Wheezing	7	13		18	12	5	7	8	12	7	8
Dyspnea	7	16		19	13	7	7	8	12	7	8
Polypnea	1	6		11	3	2	6	5	8	1	5
Hunched	3	7		6	2	2	1	3	4	3	3
Thin		1			1			1			
Enlarged abdomen		1		1					1		
Alopecia				1	1						
Tissue mass, jaw						1					
Week 86 ^b											
Wheezing	4	4		3	1						
Dyspnea	4	4		3	1						
Hunched	3	6		5	1						
Thin	1	3		4	1						
Alopecia				1							
Ataxia		3		1							
Enlarged abdomen		1		2							
Soft feces					1						

^aGiven as number of animals per group in which each sign was observed during the designated week.

^bObservations not recorded for Groups 6 through 11 at Week 36 due to error.

Note: All Group 3 males were dead as of Week 81.

TABLE 18A (Continued)
 INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
 MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 87											
Squinted eye								1			
Alopecia							1				
Wheezing		4		4		2	3	2	5	3	2
Dyspnea	2	4		4		2	3	2	5	3	2
Hunched	6	6		7	2	3	5	10	7	2	5
Thin	5	5		5		3	3	6	1	2	4
Tissue mass, jaw						1					
Enlarged abdomen	1	1			1				1	1	
Ataxia		1		1				1	1		
Soft feces		1									1
Bleeding/bloody, penis		1						1			
Week 88											
Dyspnea			1								
Tissue mass, jaw						1					
Hunched	1	2		2		5	3	7	3	3	2
Thin	1	3		1		4	4	8	4	2	2
Ataxia		2									
Enlarged abdomen	1	1								1	1
Squinted eyes								1			
Left eye closed						1					

^aGiven as number of animals per group in which each sign was observed during the designated week.

Note: All Group 3 males were dead as of Week 81.

TABLE 18A (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 89											
Hunched	2	5		2	4	5	4	3	5	3	6
Wheezing		3							1		
Dyspnea		3							1		
Ataxia		1						1	1		
Thin						3	1	3	1	2	5
Enlarged abdomen	1					1		1		1	
Tissue mass, jaw						1					
Eyes closed						1					
Week 90											
Hunched	2	4		5		4	2	4	3	2	2
Wheezing	3	9		13	9	4	7	6	11	5	7
Dyspnea	3	11		14	10	6	7	6	11	5	7
Polypnea		5			3	1	6	3	7	1	5
Ataxia						2	1	1			
Thin		1		1	1	2	1	3			
Enlarged abdomen				1		1		1		1	
Tissue mass, jaw				1		1					

^aGiven as number of animals per group in which each sign was observed during the designated week.

NOTE: All Group 3 males were dead as of Week 81.

TABLE 18A (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 91											
Hunched	2	2		3	3	3	2	4	4	3	4
Thin		2		1		1		2		1	
Ataxia		1						1			
Wheezing		4			1	1	2	1	1		2
Dyspnea		4					2	1	1		2
Enlarged abdomen											
Tissue mass, jaw				1				2		1	1
Eyes closed						1					
						1					
Week 92											
Hunched		7		5	5	2	3	5	3	4	5
Thin		4		1	3	1	3	5	1	1	3
Ataxia							1	1			
Wheezing							4	1	2	1	1
Dyspnea	1	4		1			4	1	2	1	1
Alopecia, head	1	4		1			4	1	2	1	1
Enlarged abdomen	1										
Soft feces										1	1
Week 93											
Hunched	2	7		3	6	2	2	2	3	3	6
Thin	1	4		1	1	1	1	1	1		
Ataxia		2						1			
Wheezing	1	2		1		1	3				
Dyspnea	1	2		1	1	1	3				

^aGiven as number of animals per group in which each sign was observed during the designated week.
NOTE: All Group 3 males were dead as of Week 81.

TABLE 18A (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 94											
Hunched	4	4		2	1	2	3	3	3	2	5
Thin	3	2			1	1	3	3		1	3
Ataxia	1						1				
Wheezing	2	5		7	2	1	5	4	8	4	3
Dyspnea	2	6		8	2	1	5	4	8	4	3
Polypnea				5	2		5	2	5	1	2
Enlarged abdomen		3				1					
Squinted eye(s)										2	
Week 95 ^b											
Hunched	2	3		1	4	1	1	1			
Thin	1	3			4	1	1				
Ataxia	1	2			4	1					
Wheezing		1		1	1	2	4	1			
Dyspnea		1		1	1	2	4	1			
Squinted eyes	1										
Enlarged abdomen					1		1	1			
Week 96											
Hunched	3			3	6	2	1		1	4	6
Thin	3			1	4	1			1	2	5
Ataxia	1									1	
Wheezing							1		1		
Dyspnea							1		1		
Enlarged abdomen					1	1	2			1	1
Enlarged neck							1				

^aGiven as number of animals per group in which each sign was observed during the designated week.

^bObservations not done for Groups 9 to 11 due to snow emergency.

NOTE: All Group 3 males were dead as of Week 81.

TABLE 18A (Continued)
 INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
 MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
	Week 97										
Hunched	2	2		2	2	1	1	3	1	1	3
Thin	2	1				1	1	2	1		2
Ataxia	1						1				1
Wheezing		2		1							
Dyspnea		2		1							
Enlarged abdomen					1	1	1				

^aGiven as number of animals per group in which each sign was observed during the designated week.
 NOTE: All Group 3 males were dead as of Week 81.

TABLE 18A (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
MALES											
Week 98											
Polypnea		1		3				1			1
Wheezing		2		2				1	1		2
Dyspnea		2		3				1	1		2
Hunched		2		1	1			1	1	1	3
Thin		2						1		1	
Enlarged abdomen						1					
Eyes squinted										1	
Week 99											
Wheezing		1		1							
Dyspnea		1		1							
Hunched	1	1			1	1			1		1
Thin					1	1					
Ataxia								1			
Enlarged abdomen		1									
Sores, abdomen				1							

^aGiven as number of animals per group in which each sign was observed during the designated week.

Note: All Group 3 males were dead as of Week 81.

TABLE 18A (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 100											
Wheezing		1									
Dyspnea		1									
Hunched	1	1		1	4			2	1	1	2
Thin	1	1			3			1	1	1	1
Ataxia					1	1				1	
Enlarged abdomen		1									
Sores, abdomen				1					1		
Week 101											
Wheezing		2									
Dyspnea		2									
Hunched	2	2			5	1	1	3	2	1	4
Thin	1	2			4	1		2	1		4
Ataxia		2			1			2			1
Enlarged abdomen		1				2					
Sores, abdomen				1					1		

^aGiven as number of animals per group in which each sign was observed during the designated week.

Note: All Group 3 males were dead as of Week 81.

TABLE 18A (Continued)
 INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
 MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 102											
Polypnea		1		3				1			1
Wheezing		2		2				1	1		2
Dyspnea		2		3				1	1		2
Hunched		3		1	2		1	2	1	1	3
Thin		2			1		1	2			1
Enlarged abdomen	1	1				1					
Eyes squinted											1
Week 103											
Wheezing		2									
Hunched	1	2		1	2	1	2	2	2	2	4
Thin								1		1	2
Ataxia								1			
Enlarged abdomen		1				2					

^aGiven as number of animals per group in which each sign was observed during the designated week.

Note: All Group 3 males were dead as of Week 81.

TABLE 18A (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
MALES											
Week 104											
Hunched		1		2				1	1		4
Thin	1				1			1			1
Enlarged abdomen		1			1	2					
Lethargy											1
Week 105											
Hunched		2			3	1		1	1	1	2
Thin	1				4			1	1		2
Enlarged abdomen					1	1					
Lethargy											1

^aGiven as number of animals per group in which each sign was observed during the designated week.

Note: All Group 3 males were dead as of Week 81.

TABLE 18A (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 106											
Hunched		3		7	4		1	2	1	2	4
Thin		2		5	2		1	2	1	1	2
Enlarged abdomen				1		1			1		1
Alopecia				1							
Enlarged testes				1							
Week 107 ^b											

^aGiven as number of animals per group in which each sign was observed during the designated week.

^bWeek 107 observations not recorded for all groups.

Note: All Group 3 males were dead as of Week 81.

TABLE 18A (Continued)
 INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
 MALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 108											
Hunched				1	3	1		1			2
Thin				1					1		4
Enlarged abdomen				2		1	2				
Lethargy										1	3
Rough haircoat	1				1						
Alopecia				1		2			1		
Week 109 ^b											
Wheezing				2					1		1
Dyspnea	2			2					1		1
Hunched	1			1							5
Thin											3
Polypnea				1							
Alopecia				1							

^aGiven as number of animals per group in which each sign was observed during the designated week.

^bWeek 109 observations not recorded for Groups 5, 6, and 7.

Note: All Group 3 males were dead as of Week 81.

TABLE 18A (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 110											
Wheezing	2	1						1			
Dyspnea	1										
Hunched	1			1	3	1					3
Thin											3
Enlarged abdomen						1					
Alopecia				1		2					
Week 111											
Hunched		2		2	3	2					2
Thin		1		1	1	1					2
Lethargy					1	1					
Alopecia				1		2					
Hyperactive	1										
Enlarged abdomen						1					
Enlarged testes				1							

^aGiven as number of animals per group in which each sign was observed during the designated week.

Note: All Group 3 males were dead as of Week 81.

TABLE 18A (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

PHARMACOTOXIC SIGN	MALES										
	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 112											
Dyspnea	1			1							
Hunched	2	1			2	1					
Enlarged abdomen				1		1					
Lethargy	1			1							1
Alopecia						1					1
Week 113											
Dyspnea				1							
Hunched		1		3							
Thin				2	2	2					
Alopecia					1	1					1
Lethargy				1							
Enlarged abdomen				2		1					

^aGiven as number of animals per group in which each sign was observed during the designated week.

Note: All Group 3 males were dead as of Week 81.

TABLE 18A (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 114											
Hunched		2		1	3	1					2
Thin		1			1	1					2
Lethargy					1						
Tremors						1					
Alopecia						1					
Week 115											
Pupil white, right eye		1									
Hunched				1	1	1					
Thin				1		1		1			
Alopecia											1
Week 116 ^b											
Pupil white, right eye		1									
Hunched				1	1	3		1			
Thin				1		3		2			
Alopecia											1

^aGiven as number of animals per group in which each sign was observed during the designated week.

^bWeek 116 represents the last observation interval for male groups; all remaining males were terminally sacrificed on 7-15-83 (Week 117).

Note: All Group 3 males were dead as of Week 81.

TABLE 18B

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
	Week 6 ^b										
Wheezing		1									
Dyspnea		1									
	Week 7										
	Week 8										
Sores, anus			1								
	Week 9										
Alopecia		1									
Sores, anus		1									
	Week 10										
Alopecia		1									
	Week 11										
Alopecia		1									
	Week 12										
Alopecia		1									
Wheezing		1	2								
Dyspnea		1	2								
Polypnea			1								

^aGiven as number of animals per group in which each sign was observed during the designated week.

^bNo signs observed prior to Week 6.

TABLE 18B (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 13											
Alopecia		1									
Wheezing			2								
Dyspnea			2								
Week 14											
Alopecia		1									
Wheezing			1								
Dyspnea			1								
Week 15											
Alopecia		1						1			
Wheezing			1					1			
Dyspnea											
Week 16											
Wheezing	1	3	5	7	14	4		7	8	10	11
Dyspnea	1	3	5	7	14	4		6	8	10	11
Polypnea		1	3	6	10	1		3	5	4	2
Thin			4	2	7	1	1		2	1	1
Hunched				2	6	1	1				

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 17											
Wheezing	3	7	9	7	17	12	15	10	17	13	19
Dyspnea	2	7	6	7	17	11	12	10	17	13	19
Polypnea		1	1	2	3	5	1	3	5	10	3
Thin			2	1	1	1	4	1	2	1	
Week 18											
Wheezing	8	12	14	13	15	14	6	9	13	20	18
Dyspnea	3	10	12	12	15	12	5	8	13	20	18
Polypnea		1	1	7	10	4	3	2	7	10	6
Thin	1		7	4	3	1	3	2	3	3	2
Hunched			1	1			1			1	
Ataxia				1							
Week 19											
Wheezing	8	6	14	10	15	14	6	10	14	20	18
Dyspnea	5	6	12	9	15	14	5	9	14	19	18
Polypnea		1	3	4	7	4	3	3	8	10	6
Thin	1			1		1	2		1		2
Hunched							1				
Soft feces			1				1				

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 20											
Wheezing	8	6	14	10	15	14	9	10	15	20	19
Dyspnea	5	6	11	10	15	14	8	9	14	20	18
Polypnea		1	4	4	7	5	3	3	8	10	6
Thin	1						2		2		2
Hunched							2				
Week 21											
Wheezing	5	5	7	7	13	10	8	10	15	10	13
Dyspnea	2	5	6	7	13	9	7	9	15	9	10
Polypnea		2	4	3	3	4	3	3	8	2	6
Thin		1	3	1					1	1	2
Hunched		1	2	1							
Squinted eyes	1										
Week 22											
Wheezing	12	9	12	14	18	15	15	13	13	16	15
Dyspnea	10	8	10	14	18	15	15	13	13	16	15
Polypnea	2	2	4	6	10	8	8	5	7	9	12
Thin		2	4	1		1	5			2	
Hunched		1	3	1		1	4				

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 23											
Wheezing	12	9	13	13	15	12	16	16	17	13	14
Dyspnea	10	8	11	15	15	12	16	16	17	13	14
Polypnea	2	2	4	5	8	6	5	5	4	2	6
Thin		2	4	1							
Hunched		1	4	1							
Week 24											
Wheezing	7	9	13	13	15	12	16	16	17	13	13
Dyspnea	5	8	12	13	15	12	16	16	17	13	13
Polypnea	1	3	5	5	8	6	5	6	4	3	7
Hunched	2	1	4	1							
Thin	2	1	4	1							
Squinted eyes	1										
Week 25											
Wheezing	7	10	13	13	15	12	16	16	16	13	12
Dyspnea	5	10	12	13	15	12	16	16	16	13	12
Polypnea	1	3	5	5	8	6	5	6	4	4	7
Hunched	2	2	1	1			1				1
Thin	2	2	1	1			1				1
Squinted eyes	1										

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)
 INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
 FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 26 ^b											
Wheezing				16	17	16	16	21	21	19	11
Dyspnea				16	17	15	16	21	21	19	11
Polypnea				5	7	8	3	5	7	7	4
Hunched				9	7	5	7	3	1	5	4
Thin				9	6	5	7	3	1	4	2
Sneezing						1					
Soft feces								1			
Week 27											
Wheezing	16	10	13	12	15	12	16	16	16	12	13
Dyspnea	16	10	12	12	15	12	16	16	16	12	13
Polypnea	9	3	5	4	9	5	5	6	4	3	7
Hunched	6	2	1	1	1	1	2				
Thin	4	2	1	1			1				
Week 28											
Wheezing	16	11	13	12	16	20	16	16	13	13	13
Dyspnea	16	11	12	12	16	19	16	16	13	12	13
Polypnea	8	3	5	3	9	6	5	6	3	3	7
Hunched	3	1	1	2	2	9	1				
Thin	1	1	1	1	1	5					
Ataxia						4					

^aGiven as number of animals per group in which each sign was observed during the designated week.

^bWeek 26 data not available for Groups 1, 2, and 3 due to technical error.

TABLE 18B (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 29											
Wheezing	16	13	13	14	16	20	16	17	13	13	14
Dyspnea	16	13	12	14	16	20	16	17	13	12	14
Polypnea	8	3	5	4	9	6	5	6	3	3	7
Hunched	2	1	2	5	2	7	2				
Thin	2	1	1	3	2	4	1				
Ataxia						1					
Week 30											
Wheezing	7	3	8	17	18	25	18	29	24	27	14
Dyspnea	7	3	8	17	18	23	18	29	24	26	14
Polypnea		1	2	9	9	14	7	11	13	9	5
Hunched	7	3	7	10	9	12	14	7	6	15	8
Thin	5	2	7	8	6	9	13	4	4	12	7
Sneezing						1					
Soft feces								1			

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 31											
Wheezing	16	13	12	14	15	18	15	16	13	13	13
Dyspnea	16	13	12	14	15	18	15	16	13	12	13
Polypnea	8	3	4	4	9	6	10	7	3	3	5
Hunched	2	1	2	5	2	6	1				
Thin	2	1	1	4	2	2					
Squinted eyes	1	1									
Ataxia						1					
Week 32											
Wheezing	16		13	15	15	18	15	16	13	13	13
Dyspnea	16		13	15	15	18	15	16	13	12	13
Polypnea	8		4	5	9	6	5	7	3	3	5
Hunched	3		2	3	2	6	1	1		2	
Thin	2		1	3	1	3	1	1		2	
Soft feces								1			
Week 33											
Wheezing	17	13	13	16	14	19	13	16	13	12	13
Dyspnea	17	13	13	16	14	19	13	16	13	11	13
Polypnea	8	3	4	5	8	6	4	7	3	2	5
Hunched	2	1	3	7	6	7	4	1		1	
Thin	2	1	3	7	5	3	4	1		1	
Soft feces								1			

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 34											
Wheezing	12	6	8	20	18	28	17	29	24	25	15
Dyspnea	12	6	8	20	18	26	17	29	24	24	15
Polypnea		1	2	9	8	14	6	11	12	9	5
Hunched	10	5	9	12	9	14	14	8	8	11	9
Thin	7	3	8	7	5	10	12	4	3	11	8
Soft feces			1	1				1			1
Sneezing						1					
Week 35											
Wheezing	17	14	12	16	14	19	13	16	13	12	15
Dyspnea	17	14	12	16	14	19	13	16	13	11	13
Polypnea	8	3	4	6	8	7	4	7	3	2	6
Hunched	2	1	3	10	6	4	4			1	
Thin	2	1	2	4	5	1	2				
Week 36 ^b											
Wheezing		13	12	15	14	19	13	16	12	12	15
Dyspnea		13	12	15	14	19	13	16	12	11	14
Polypnea		4	4	6	8	7	4	8	2	2	6
Hunched		1	3	7	8	4	3			1	
Thin		1	2	1	3	1	1				

^aGiven as number of animals per group in which each sign was observed during the designated week.

^bWeek 36 data for Group 1 females not available.

TABLE 18B (Continued)
 INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
 FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 37											
Wheezing	15	13	12	16	15	19	14	13	12	12	16
Dyspnea	15	13	12	15	15	19	14	12	12	11	15
Polypnea	6	4	3	5	8	6	3	6	2	3	8
Hunched	2	3	8	9	8	13	8	14	11	12	7
Thin	1	2	7	5	4	7	5	12	9	9	6
Soft feces						1		1			
Obese						1					
Tremors						1					
Lethargy						1	1	2			1
Alopecia								1			
Squinted eyes									1		1
Week 38											
Wheezing	10	11	12	21	20	19	14	16	14	26	18
Dyspnea	10	10	11	21	19	19	14	16	14	26	17
Polypnea	2	1	4	10	7	8	2	6	5	10	6
Hunched	9	13	11	13	16	7	11	12	8	16	12
Thin	6	5	9	7	7	5	11	12	7	15	11
Alopecia			1					1			
Lethargy							1	1		2	
Squinted eyes								1			

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 39											
Wheezing	16	15	10	16	14	17	17	14	14	13	16
Dyspnea	16	15	10	15	14	17	16	14	14	13	16
Polypnea	8	8	3	5	8	7	4	8	4	3	7
Hunched	5	6	8	6	6	12	8	3	8	6	1
Thin	4	6	7	4	4	3	4	1	6	3	
Prostrate	2	3					1				
Squinted eyes	1								1		
Alopecia			1		1						
Soft feces						2					
Obese						1					
Week 40											
Wheezing	15	14	15	14	16	18	16	18	15	10	16
Dyspnea	15	14	14	14	16	18	15	17	15	10	16
Polypnea	7	7	6	3	8	4	3	6	5	5	7
Hunched	9	7	10	4	12	10	11	14	15	14	10
Thin	4	3	7		5	3	3	6	3	4	5
Prostrate			1								
Alopecia					3	1			1		
Obese						1					
Squinted eyes							1				
Soft feces								1			
Enlarged abdomen								1		1	

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 41											
Wheezing	9	11	16	14	14	15	11	19	14	10	14
Dyspnea	9	9	15	14	14	15	10	19	14	10	14
Polypnea	2	3	2	5	2	3			3	3	1
Hunched	15	15	9	15	19	12	7	10	9	9	10
Thin	7	6	5	9	12	2	1	1		1	
Ataxia		1		1							
Alopecia						1					
Soft feces						1					
Obese						1					
Head tilt						1					
Enlarged abdomen									1		
Week 42											
Wheezing	11	11	13	21	21	20	13	17	15	26	18
Dyspnea	9	10	10	21	19	19	14	15	14	25	16
Polypnea	4	1	4	10	7	8	2	5	7	10	6
Hunched	8	14	7	10	12	8	11	14	10	11	9
Thin	6	5	5	4	7	5	11	10	7	12	8
Ataxia				1							
Soft feces					1		1	1		1	
Enlarged abdomen									1		

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 43											
Wheezing	10	11	12	13	14	10	12	15	14	15	14
Dyspnea	10	9	12	13	14	10	12	14	14	15	14
Polypnea	2	3	1	2				2	3	2	1
Hunched	15	14	7	9	8	14	15	16	15	11	13
Thin	7	5	3	3	3	3	6	5		5	1
Lethargy		1									
Ataxia		1									
Squinted eyes				1							
Soft feces						2	1				
Obese						1					
Alopecia							1				
Enlarged abdomen									1		
Week 44											
Wheezing	14	12	13	14	19	21	16	18	12	17	21
Dyspnea	14	12	13	14	19	21	16	18	12	17	21
Polypnea	1	1		1			1				2
Hunched	5	6	4	8	7	8	8	8	7	8	14
Thin	1	1	1	5	2	2	3	3	1	1	4
Ataxia				1		1					
Soft feces					1	4			1		
Obese						1					

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)
 INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
 FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 45											
Wheezing	12	10	10	9	10	16	16	21	21	17	16
Dyspnea	12	10	10	9	10	16	16	21	21	17	16
Polypnea	3				8						1
Hunched	15	18	10	12	3	9	9	15	9	9	9
Thin	11	16	4	6			1	9	4	3	5
Ataxia	1	2						2	1	1	
Alopecia			1		1						
Soft feces			1								
Obese						1					
Week 46											
Wheezing	11	12	14	19	21	19	14	21	16	26	19
Dyspnea	10	11	12	20	20	19	13	17	15	26	18
Polypnea	4	1	4	9	5	8	2	5	8	10	6
Hunched	9	11	7	12	7	3	10	13	10	8	4
Thin	5	5	4	4	6	4	10	10	7	9	8
Soft feces		1			1			1		1	
Alopecia			1								
Obese						1					
Ataxia						1		1		1	
Enlarged abdomen	1										

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)
 INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
 FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 47											
Wheezing	13	13	10	18	10	15	15	21	17	17	20
Dyspnea	13	13	10	18	10	15	15	21	17	17	20
Polypnea	2					1	1	3	1		
Hunched	10	5	8	7	3	8	2	11	8	9	8
Thin	4		6	2		3	2	7	1	3	1
Enlarged abdomen	2								1		
Altopecia			1				1				
Soft feces			1		1				1		1
Ataxia			1	1		1		1			
Obese						1					
Hypersensitive											
Week 48 ^b											
Wheezing	17	16		16	11	22	14	20	19	13	14
Dyspnea	17	16		16	11	22	14	20	19	13	14
Polypnea	1	2						7			1
Hunched	12	8		6	8		4	3	8	7	6
Thin	1	1			1		1				
Soft feces					1				1		
Obese						1					
Hypersensitive						1					

^a Given as number of animals per group in which each sign was observed during the designated week.
^b Week 48 data not available for Group 3 due to technical error.

TABLE 18B (Continued)
 INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
 FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 49											
Wheezing	16	18	11	15	14	12	13	20	15	17	17
Dyspnea	16	18	11	15	14	12	13	20	15	17	17
Polypnea	1	2	5				5	2		7	2
Hunched	7	6	3	10	5	4	1	13	11	8	6
Thin		3		4		1		4	3		
Ataxia		1		1				1		1	
Alopecia			1					1			
Soft feces					1			1			
Obese											
Protrusion, anus									1		
Week 50											
Wheezing	13	13	14	19	20	20	14	23	16	26	22
Dyspnea	11	11	14	20	20	19	14	21	14	26	19
Polypnea	5	2	6	9	5	8	2	7	8	10	8
Hunched	12	10	6	10	11	10	8	12	6	6	6
Thin	8	4	6	5	7	1	6	8	5	8	5
Alopecia			1		1						
Obese						1					
Ataxia								1		1	
Squinted eyes											
Tissue mass, back		1									
Soiled anal area			1						1		

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 51											
Wheezing	14	16	14	14	13	17	14	16	13	10	14
Dyspnea	14	16	14	14	13	17	14	16	13	10	14
Polypnea	2	3	1	1	3	4	1	2	2		
Hunched	6	5	4	6	5	2	3	12	7	7	7
Thin	3	3	2	2	3	1	1	5	4	2	1
Enlarged abdomen						1					
Alopecia			1					2			
Ataxia				1				1			
Obese						1					
Week 52											
Wheezing	12	13	8	10	12	14	16	18	17	16	16
Dyspnea	12	13	8	10	12	14	16	18	17	16	16
Polypnea	2						5	2		4	4
Hunched	11	5	7	4	8	2	1	4	5	8	9
Thin	5	1	2	1	1			2	3		1
Soft feces					1					1	
Obese						1					
Enlarged abdomen		1						1			
Ataxia								1			1
Alopecia	1				1			1			
Tissue mass, back			1								

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
FEMALES											
Week 53											
Wheezing	12	12	10	19	7	17	14	21	13	16	16
Dyspnea	12	12	10	19	7	17	14	21	13	16	16
Polypnea	1	7	1	1	7	1	2	1	1	3	1
Hunched	7	1	5	8	7	8	6	1	9	2	2
Thin	1		2	2	3	1	1	1	5		
Soft feces					1						
Ataxia	1		1	1	1		2				
Altopecia			1		1			1			1
Obese						1					
Enlarged abdomen		1						2	1		
Squinted eyes										1	
Tissue mass, back			1								

^a Given as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
FEMALES											
Week 54											
Wheezing	13	15	12	23	20	19	14	23	16	25	22
Dyspnea	12	13	12	20	20	19	16	22	15	25	22
Polypnea	4	5	6	10	5	9	2	8	8	10	8
Hunched	13	7	2	6	10	9	17	12	16	9	14
Thin	7	3	4	5	7	1	7	6	4	7	5
Alopecia			1		1			2			
Tissue mass, back			1								
Ataxia				1			2			1	
Soft feces					1			1			
Obese						1					
Soiled anal area									1		
Enlarged abdomen								1	1		
Week 55											
Wheezing	12	14	13	15	11	13	15	15	13	13	18
Dyspnea	12	14	13	15	11	13	15	15	13	13	18
Polypnea	3		1	1	1	1	6	1	2		1
Hunched	4	8	7	9	6	6		1	6	4	1
Thin	2	3	3	4	1				1		
Ataxia		1	3	3	3	1	1				
Tissue mass, back			1								
Obese						1					
Head tilt							1				
Alopecia								1			
Enlarged abdomen								1	1		
Soft feces									1		

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 56 ^b											
Wheezing	14	8	7	10	12	17	15				
Dyspnea	14	8	7	10	12	17	15				
Polypnea	2		1	1		2	2				
Hunched	2	9		11	5	2	2				
Thin		4		1	1	1					
Alopecia		1									
Ataxia		1		2							
Soft feces				1							
Enlarged abdomen				1							
Obese							1				
Week 57											
Wheezing	17	14	10	21	13	13	17	15	15	10	20
Dyspnea	17	14	10	21	13	13	17	15	15	10	20
Polypnea	2			1			3	1		1	2
Hunched	4	7	3	4	2	1	1	2	4	1	1
Thin	1	5	1	1					2	1	1
Ataxia		2									
Alopecia			1					2		1	
Tissue mass, back			1								
Soft feces					1						
Obese											

^aGiven as number of animals per group in which each sign was observed during the designated week.

^bWeek 56 observations inadvertently not recorded for Groups 8 through 11.

TABLE 18B (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 58											
Wheezing	12	14	11	25	20	17	16	21	10	23	23
Dyspnea	12	14	11	23	21	18	16	21	9	23	22
Polypnea	4	5	5	10	5	9	2	8	6	10	9
Hunched	10	6	4	3	5	8	10	9	8	5	6
Thin	6	4	1	4	7	2	7	6	5	6	5
Alopecia	1		1		2		4				2
Tissue mass, back			1								
Ataxia							1				1
Soft feces					1		1				
Obese						1					
Enlarged abdomen				1						1	
Week 59											
Wheezing	16	11	6	14	9	15	14	12	15	12	11
Dyspnea	16	11	6	14	9	15	14	12	15	12	11
Polypnea				1				1		1	1
Hunched	7	8	6	3	10	5	3	2	2	1	2
Thin	2	4	2		4	1	1				
Ataxia	2	1		1	1	1					
Obese						1					
Alopecia	1	1			1	1		1		1	
Enlarged abdomen					1	1		1		1	
Sores			1								

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 60											
Wheezing	19	20	15	17	18	9	13	14	15	11	7
Dyspnea	19	20	15	17	18	9	13	14	15	11	7
Hunched	5	7	6	4	9	5	2	2	2		3
Thin	5	8	4	1	6	2	1	1	1		1
Alopecia	1	1						1		1	1
Ataxia	2	3	1								
Soft feces	1		1	1				1			
Lethargy	1	1									
Obese						1					1
Soiled anal area						1					
Prostrate						1					
Bleeding vagina				1							
Sores		1									
Squinted eyes	1	1			1						
Anorexia											
Week 61											
Wheezing	25	20	20	20	27	7	12	9	7	7	8
Dyspnea	25	20	20	20	27	7	12	9	7	7	8
Polypnea							1				
Hunched	4	7	4	4	10	3	2	2	3	1	3
Thin	2	7	4	2	6			1			
Ataxia	2			1	3						
Alopecia		2				2		2	2	1	2
Sores			1								
Soft feces			1		1			1	2		
Obese						1					
Soiled anal area						1					1
Lethargy		2		1	3				1		
Prostrate										1	
Squinted eyes		1		1	4						

^a Given as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)
 INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
 FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
	Week 62										
Wheezing	10	14	8	23	17	18	16	19	10	22	23
Dyspnea	10	13	7	23	17	18	16	19	10	22	22
Polypnea	4	5	4	11	4	9	4	9	6	11	9
Hunched	2	4	3	3	6	8	10	7	7	6	6
Thin	4	3	1	2	5	1	6	5	4	6	4
Enlarged abdomen	1	1	1	1				1		1	
Ataxia		1	1				5	1		1	2
Allopecia			1					1			3
Soft feces					1						1
Obese						1					

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 63											
Wheezing	12	9	4	6	8	10	6	7	4	5	5
Dyspnea	12	9	4	6	8	10	5	7	4	5	4
Polypnea	1				1				1	2	1
Hunched	8	8	5	6	10	7	8	5	6	5	5
Thin	3	5	2	2	3	5	3	2	3		
Alopecia								1		4	2
Ataxia	1				1	1				1	2
Soft feces	1			1	1					1	1
Obese						1					
Enlarged abdomen	2	1		1				1	1	2	
Squinted eyes											1
Week 64											
Wheezing	6	3	5	6	3	4	6	6	8	7	6
Dyspnea	6	3	5	6	3	4	6	6	8	7	6
Polypnea	1	1	2						1	1	2
Hunched	5	6	6	6	5	9	6	7	5	11	7
Thin	1	4	5	3	1	4	3	3	3	7	5
Ataxia			3				1		1	2	3
Obese						1					
Alopecia					1		1	1			2
Enlarged abdomen	1	1						1	1		
Soft feces		1							1	3	

^a Given as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 65											
Polypnea	4	1	2	6	3	5	4	1	2	2	1
Wheezing	4	1	2	6	3	5	4	8	8	6	4
Dyspnea	6	5	7	2	4	4	7	8	7	3	6
Hunched	2	2	4		2	3	3	3	2	2	6
Thin				1		1	1	1			2
Alopecia			2	1		1	2				2
Ataxia					1				1		
Soft feces			1	1							
Lethargy						1					
Obese											
Enlarged abdomen						1				1	
Paralysis											1

Week 66											
Wheezing	9	10	7	19	16	12	9	16	10	17	17
Dyspnea	9	11	6	23	16	16	9	17	10	18	16
Polypnea	3	3	4	11	3	9	2	5	5	9	5
Hunched	2	5	4	5	6	9	7	8	5	5	6
Thin	3	3	3	3	6	4	5	6	2	6	1
Ataxia			1	1				1			3
Alopecia			1			1		2			1
Soft feces					1		1			1	1
Obese						1					
Lethargy			1								
Enlarged abdomen				1						1	

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)
 INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
 FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 67											
Wheezing	7	4	4	5	5	8	4	6	8	5	7
Dyspnea	7	4	4	5	5	7	3	6	8	5	7
Polypnea				2			1				
Hunched	6	7	5	2	3	5	9	6	4	4	4
Thin	1	4	3	1	3	4	3		2	2	2
Alopecia				1				1			1
Ataxia		1				1			1		
Obese											
Week 68											
Wheezing	6	3	3	3	5	6	3	7	8	5	8
Dyspnea	6	3	3	3	4	6	3	7	7	5	8
Polypnea			1								
Hunched	4	4	8	8	1	7	7	5	3	11	5
Thin	1	2	6	3		2	6	3	3	5	4
Ataxia			1							1	3
Obese						1					
Alopecia						1	1	1			
Enlarged abdomen										2	

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 69											
Polypnea	4	3	3	2	7	4	3	6	5	10	1
Wheezing	4	3	3	2	7	4	3	6	5	10	1
Dyspnea	2	3	5	5	5	3	4	4	4	7	5
Hunched	1	2	2	3	4	1	2	4	4	4	2
Thin					1	1	1	1	1		
Alopecia					1						1
Ataxia								1			
Soft feces						1					
Obese				1						3	
Enlarged abdomen											
Squinted eyes					1						
Week 70											
Wheezing	9	9	5	13	15	11	9	16	6	14	13
Dyspnea	8	9	4	15	15	13	9	16	6	15	12
Polypnea	3	2	3	5	3	8	2	5	3	8	4
Hunched	2	4	2	1	6	8	6	7	1	4	3
Thin	1	1	1	2	5	3	4	3	1	5	
Ataxia											1
Alopecia			1			1		2		1	
Soft feces					1						1
Obese											
Enlarged abdomen	1			2		1				2	1

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
	Week 71										
Wheezing	4	3	1	1	6	7	2	8	7	7	4
Dyspnea	4	3	1	1	6	7	2	8	7	6	4
Hunched	3	2	2	3	2	7	9	7	2	4	3
Thin			2	1		2	3	6	2		2
Alopecia					1			1			2
Ataxia								2		1	
Soft feces										1	
Obese						1					
Enlarged abdomen							1	1	1	1	1
	Week 72										
Wheezing	3	2		2	4	6	3	7	3	5	5
Dyspnea	3	2		2	4	6	3	7	3	5	5
Hunched	8	1	2	5	9	7	6	10	3	3	1
Thin	1	1	1	3	3	1	2	4		1	
Ataxia					1			2			
Alopecia					1	1		2			1
Enlarged abdomen		2			1	1	1	2	1	4	
Squinted eyes											
Tissue mass, left forepaw					1						1

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 73											
Polypnea	8	1		5	4	2	3	7	3	3	5
Wheezing	8	1		5	4	2	3	7	3	3	5
Hunched	4	1	2	3	2	5	7	5	4	6	3
Thin			1			4	2	2	2	4	2
Alopecia		1			1	2		1			
Ataxia						1		1			
Enlarged abdomen		1					1	1	1	2	1
Tissue mass, left forepaw											1
Week 74											
Wheezing	11	10	4	17	16	8	11	14	4	10	10
Dyspnea	11	10	4	19	16	11	11	14	4	12	8
Polypnea	3	2	3	5	3	7	1	5	2	7	3
Hunched	2	3	2	1	5	5	4	7	3	6	1
Thin	4	2		3	5	4	3	3		2	
Ataxia								1			
Alopecia						1		2			
Obese						1					
Enlarged abdomen	1	1							2	2	1
Tissue mass, mouth	1										

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 75											
Wheezing	3		1	2	3	4	5	4	3	6	4
Dyspnea	3		1	2	3	4	5	4	3	5	4
Hunched	3	4	4	3	3	4	8	5	3	4	1
Thin	2	1				1	1	4	2	2	
Alopecia				1	1			1			
Ataxia	1		1			1					
Soft feces				1							
Obese						1					
Enlarged abdomen	2	2							1	1	
Squinted eyes										1	
Week 76											
Wheezing	2	2	2	3	3	1	4	4	2		3
Dyspnea	2	2	2	3	3	1	4	4	2		3
Hunched	5	1	4	3		3	5	6	6	3	1
Thin	2		2	1				3	5		1
Ataxia	1		1					1	2		
Alopecia					1			1		1	
Enlarged abdomen		2							1	1	
Soft feces										1	

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)
 INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
 FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	I	2	3	4	5	6	7	8	9	10	11
Week 77											
Wheezing	3		1	2	3	2	1	4	2	2	5
Dyspnea	3		1	2	3	2	1	4	2	2	5
Hunched	5	1	2	4		5		3	3	1	
Thin	3			2		3			2		
Alopecia					1			1			
Ataxia	1										
Enlarged abdomen		2			1				1	1	
Week 78											
Wheezing	5	10	4	16	14	6	9	10	3	9	7
Dyspnea	5	10	4	18	13	7	9	11	3	10	7
Polypnea	2	2	3	5	3	3		5	1	6	3
Hunched	3	3	2	2	5	5	5	6	2	5	2
Thin	2	2		3	4	3		3	1	2	
Alopecia					1						
Enlarged abdomen		2		1	1		1			1	
Obese						1					

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 79 ^b											
Wheezing	3	1		5		3	2	6	1	3	1
Dyspnea	3	1		5		3	2	6	1	3	1
Hunched	3	1		5	2	2	1	2	5	3	2
Thin	2			1	1	1		1	2		
Alopecia					1						
Enlarged abdomen		1		3		1	2			1	
Obese						1					
Week 80											
Wheezing	3	2	1	3	2	2	4	5	3	2	4
Dyspnea	3	2	1	3	2	2	4	5	3	2	4
Hunched	5	4	3	2	2	4		3	3	4	2
Thin	5	1	2		2			2	3	1	1
Alopecia					1						
Enlarged abdomen		1		1			1			1	
Obese						1					
Soft feces	1										

^aGiven as number of animals per group in which each sign was observed during the designated week.

^bNo pharmacotoxic signs were observed in the surviving Group 3 females during Week 79.

TABLE 18B (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

PHARMACOTOXIC SIGN	FEMALES										
	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 81 ^b											
Wheezing		1		3		3	2	1	2	1	2
Dyspnea		1		3		3	2	1	2	1	2
Hunched	2	3	2			3	1	1	4	4	1
Thin		3	1			3	1		1	2	1
Enlarged abdomen		1					1				1
Obese						1					
Week 82											
Wheezing	3	8	3	13	12	5	8	9	3	8	6
Dyspnea	3	7	3	15	12	5	8	10	3	9	6
Polypnea	1	1	2	5	3	1		5	1	5	3
Hunched	2	3	2	1	4	3	5	6	3	4	1
Thin	1	1		2	3	2		3	1	2	
Alopecia				1	1				1		
Enlarged abdomen							1			1	
Soft feces				1							
Obese						1					

^aGiven as number of animals per group in which each sign was observed during the designated week.

^bNo pharmacotoxic signs were observed in the surviving Group 5 females during Week 81.

TABLE 18B (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 83											
Wheezing		2	1	2	2	2		5	1	1	2
Dyspnea		2	1	2	2	2		5	1	1	2
Hunched	5	6	1	2	2		1	2	3	4	4
Thin	1	2		1	2			1	2	2	2
Alopecia					1						
Ataxia	1										1
Enlarged abdomen							1			1	
Week 84											
Wheezing	1	1	2	3	3		1	4	1	1	2
Dyspnea	1	1	2	3	3		1	4	1	1	2
Hunched		2		3	3	2	5	3		4	1
Thin		1			1		2	1		4	1
Ataxia					1			1			
Enlarged abdomen										1	

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 18B (Continued)
 INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
 FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
	Week 85										
Polypnea	1	1	1	5	3			4	1	5	3
Wheezing	3	5	2	12	11	3	7	9	2	7	4
Dyspnea	3	4	2	14	11	3	7	9	2	8	5
Hunched	2	2	1	2	3	3	7	5	1	3	2
Thin	1	1		2	2	1		3	1	2	
Alopecia				1					1		
Enlarged abdomen	1									1	1
Soft feces										1	
Ataxia				1							
	Week 86 ^b										
Wheezing			1	1	2						
Dyspnea			1	1	2						
Hunched	3		2	6	5						
Thin		2	1	2	5						
Ataxia		1									

^aGiven as number of animals per group in which each sign was observed during the designated week.

^bObservations not recorded for Groups 6 through 11 at Week 86 due to error.

TABLE 18B (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 87											
Wheezing	1				2		1	2		1	
Dyspnea	1				2		1	2		1	
Hunched	1	3		4	5	4	6	5	2	4	
Thin	1			2	2	4	2	4	2	1	
Ataxia	1			1							
Enlarged abdomen						1				1	
Soft feces						1					
Week 88											
Hunched	1	2		3		1	4	4	1		1
Thin	1			1		1	4	4	2		1
Ataxia	1			1							
Enlarged abdomen						1				1	

^aGiven as number of animals per group in which each sign was observed during the designated week.

TABLE 188 (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 89											
Hunched	2	2	1	1	3	3	5			3	2
Thin	1		1				3			3	
Enlarged abdomen						1				1	
Wheezing							1				
Dyspnea							1				
Week 90											
Hunched		4		4	2	1	5	1	1	2	
Thin	1	1		2	1			2	1	2	
Wheezing	1	4		5	9	2	6	5	2	3	2
Dyspnea	1	3		6	9	2	6	5	2	4	3
Polypnea	1	1		1	3			1	1	2	2
Soft feces				1							
Alopecia, back				1				1			
Enlarged abdomen					1						
Week 91											
Hunched	2	3		3		1	3	2		1	2
Thin				1				2		1	
Wheezing		1		1		1					1
Dyspnea		1		1		1					1
Ataxia		1						1			

^aGiven as number of animals per group in which each sign was observed during the designated week.

NOTE: All Group 3 females were dead as of Week 91.

TABLE 18B (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 92											
Hunched	2	1		3	3		1		1		
Thin	1				2		2			1	
Wheezing				1				1		1	
Dyspnea				1				1		1	
Ataxia	1						1				
Enlarged abdomen		1								1	
Squinted eye					1						
Week 93											
Hunched		1		3	2		2	1	3	3	
Thin	1							1	3		
Wheezing				3							
Dyspnea				3							
Enlarged abdomen				1							
Week 94											
Hunched	1	2		1			4	4	1		
Thin	2	2		2			1	4	1		
Wheezing		2					3	1	2	1	1
Dyspnea		1		1			3	1	2	1	1
Ataxia	1	1									
Polypnea		1		1				1	1		1
Alopecia, back											

^aGiven as number of animals per group in which each sign was observed during the designated week.

NOTE: All Group 3 females were dead as of Week 91.

TABLE 18B (Continued)
 INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
 FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 95 ^b											
Hunched	1			1	1		4	4			
Thin	1				1		1	2			
Ataxia	1				1						
Wheezing				2	1						
Dyspnea				2	1						
Week 96											
Hunched		2		2			3	1	1	1	
Thin		1		1					1	1	
Ataxia										1	
Enlarged abdomen				1				1			
Week 97											
Hunched		1		5	1	1	3	2	1		
Thin		1		1	1	1		1	1		
Ataxia											1
Enlarged abdomen				1							

^aGiven as number of animals per group in which each sign was observed during the designated week.

^bObservations not done for Groups 9 to 11 due to snow emergency.

NOTE: All Group 3 females were dead as of Week 91.

TABLE 18B (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS
FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 98											
Polypnea									1		1
Wheezing		1					3		2		1
Dyspnea							3		2		1
Hunched		2		2			3	2			1
Thin		1		1				2			1
Enlarged abdomen				1							
Week 99											
Hunched											
Thin		1		2		1	3			2	
		1					2			1	

^a Given as number of animals per group in which each sign was observed during the designated week.

Note: All Group 3 females were dead as of Week 91.

TABLE 18B (Continued)
INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

PHARMACOTOXIC SIGN	FEMALES										
	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
Week 100											
Hunched	1			2	1	1	3	2			1
Thin					1	1	3	1			
Ataxia	1										
Week 101											
Hunched		2		1	1		2			1	
Thin		2		1	1		2			1	
Ataxia							1				
Enlarged abdomen	1			1				1			

^aGiven as number of animals per group in which each sign was observed during the designated week.

Note: All Group 3 females were dead as of Week 91.

TABLE 188 (Continued)

INCIDENCE OF PHARMACOTOXIC SIGNS - CHRONIC STUDY

CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS FROM IRON FOUNDRY CASTING OPERATIONS

FEMALES

PHARMACOTOXIC SIGN	INCIDENCE OF SIGNS ^a										
	GROUP										
	1	2	3	4	5	6	7	8	9	10	11
	Week 102 ^b										
Polypnea		1									1
Wheezing							2				1
Dyspnea							2				1
Hunched		1		2	1		2	2			1
Thin		1		1	1			2			1
Enlarged abdomen									1		

^aGiven as number of animals per group in which each sign was observed during the designated week.

^bWeek 102 represents the last observation interval for female groups; all remaining females were terminally sacrificed on 4-6-83 (Week 103).

Note: All Group 3 females were dead as of Week 91.

TABLE 19
MEAN BODY WEIGHTS

EXPLANATION OF SUPERSSCRIPTS

- ^aWeight change (weight at the given interval minus initial weight) significantly lower than vehicle control value at the 0.05 level after adjustment for multiple comparisons
- ^bWeight change (weight at the given interval minus initial weight) significantly lower than vehicle control value at the 0.01 level after adjustment for multiple comparisons
- ^cWeights not taken due to breakdown of automatic weighing station
- ^dAll animals dead
- ^eWeights not available for Weeks 106 and 114 due to error

GROUP IDENTIFICATION

GROUP NUMBER	TREATMENT	DOSE LEVEL (mg/0.2 ml distilled water)
1	Vehicle Control	--
2	Ferric Oxide Control (Fe_2O_3 + Vehicle)	3.0
3	Positive Control (BaP + Fe_2O_3)	3.0 + 3.0
4	Shell Sand	5.0
5	Shell Sand	10.0
6	Green Sand	5.0
7	Green Sand	10.0
8	Furan	5.0
9	Furan	10.0
10	Urethane	2.5
11	Urethane	5.0

TABLE 19A
MEAN BODY WEIGHTS
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)

MALES

GROUP NUMBER		STUDY WEEK									
		1	2	3	4	5	6	7	8	9	10
1	MEAN	91.6	92.6	96.0	97.8	103.4	107.0	110.5	115.4	117.2	119.2
	S.D. N	6.0 45	6.7 43	8.0 48	7.5 48	8.0 48	9.5 48	9.1 45	10.0 48	10.3 48	11.1 48
2	MEAN	92.7	92.7	94.7	97.6	101.6	105.0	110.1	113.1	116.5	118.0
	S.D. N	5.8 56	5.8 50	6.9 50	8.1 50	9.0 50	9.0 50	9.9 50	10.0 50	10.6 50	11.5 50
3	MEAN	94.0	91.9 ^a	94.4 ^b	95.9 ^b	97.3 ^b	98.5 ^b	102.5 ^b	103.7 ^b	107.5 ^b	109.2 ^b
	S.D. N	6.0 48	7.2 48	5.3 48	6.3 48	8.6 48	8.2 48	12.8 48	12.5 48	11.3 48	10.6 43
4	MEAN	92.8	92.3	95.1	97.6 ^b	100.8 ^a	102.6 ^b	106.2 ^b	107.6 ^b	110.7 ^b	112.1 ^b
	S.D. N	6.2 50	5.9 50	6.1 50	6.8 50	7.5 50	8.3 50	9.2 50	9.7 50	9.3 50	8.6 50
5	MEAN	92.1	90.1 ^b	90.0 ^b	93.6 ^b	95.9 ^b	98.6 ^b	100.9 ^b	104.5 ^b	106.1 ^b	106.3 ^b
	S.D. N	6.0 50	7.3 50	7.1 50	7.2 50	8.0 50	7.8 50	8.8 50	9.4 50	9.0 50	8.9 50
6	MEAN	91.8	90.7 ^a	93.8	95.2 ^b	99.2 ^a	102.1 ^b	105.5 ^a	108.0 ^b	110.4 ^b	112.5 ^a
	S.D. N	6.0 50	7.4 50	7.2 50	7.6 50	8.5 50	7.8 50	8.6 50	9.7 50	10.9 50	12.6 50
7	MEAN	93.9	91.5 ^a	95.2	97.6 ^b	101.5 ^a	103.8 ^a	106.8 ^a	109.2 ^b	111.9 ^b	114.5 ^a
	S.D. N	6.2 48	8.6 48	7.7 48	8.8 48	8.4 48	11.1 48	9.7 48	10.8 48	11.0 48	11.2 48
8	MEAN	91.0	89.0 ^b	92.4 ^a	94.4 ^b	98.9 ^a	102.3	105.7	107.8 ^b	111.1 ^a	112.8 ^a
	S.D. N	6.3 50	6.3 50	6.9 50	6.7 50	8.0 50	8.9 50	11.0 50	10.6 50	10.8 50	11.5 50
9	MEAN	92.3	89.0 ^b	91.3 ^b	95.3 ^b	96.9 ^b	100.8 ^b	104.5 ^b	106.2 ^b	109.3 ^b	110.4 ^b
	S.D. N	6.9 49	9.5 49	8.8 49	8.7 49	8.6 49	9.1 49	9.3 49	9.7 49	9.1 49	11.0 49
10	MEAN	92.1	94.6	96.2	99.4	102.7	106.8	111.2	113.3	115.9	119.3
	S.D. N	5.5 50	6.4 50	6.7 50	7.5 50	7.9 50	8.2 50	8.6 50	9.5 50	10.6 50	12.9 50
11	MEAN	91.7	92.0	93.7 ^a	97.3	100.0 ^a	102.9 ^a	107.4	109.8 ^b	112.1 ^a	113.9
	S.D. N	5.8 49	6.0 49	5.9 49	7.4 49	7.6 49	8.0 49	7.9 49	9.0 49	9.8 49	12.7 49

TABLE 19A (Continued)
 MEAN BODY WEIGHTS
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS
 FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)

MALES

GROUP NUMBER		STUDY WEEK									
		11	12	13	14	15	16	17	18	22	26
1	MEAN	120.2	122.7	125.7	125.0	124.8	125.0	123.9	124.6	123.6	120.4
	S.D. N	11.1 48	12.0 48	12.8 48	13.3 48	12.7 48	13.6 48	14.1 48	14.3 48	13.4 48	12.8 47
2	MEAN	119.2	120.6	122.2	121.6	121.5	122.8	121.9	121.9	124.0	119.2
	S.D. N	11.6 50	11.9 50	12.6 50	12.6 49	13.4 49	12.8 49	14.7 49	13.0 48	13.9 48	14.8 47
3	MEAN	108.0 ^b	101.7 ^b	102.7 ^b	105.8 ^b	106.6 ^b	106.9 ^b	104.8 ^b	103.8 ^b	108.5 ^b	104.3 ^b
	S.D. N	10.1 48	12.2 48	13.3 47	15.2 47	12.3 46	12.4 45	13.3 45	12.2 44	13.9 44	11.1 42
4	MEAN	114.0 ^b	114.2	-----c	114.6 ^a	114.5 ^a	115.5	115.9	116.4	119.2	117.6
	S.D. N	10.4 50	11.1 50	-----c	12.4 50	11.4 50	12.0 50	11.6 50	12.0 50	11.5 50	13.0 49
5	MEAN	107.5 ^b	108.7 ^b	-----c	111.5 ^b	112.1 ^b	112.5 ^b	113.0 ^b	111.7 ^b	115.0 ^a	113.3 ^b
	S.D. N	9.1 50	9.5 50	-----c	10.4 50	10.7 50	10.1 48	11.0 48	11.7 48	13.6 48	13.0 48
6	MEAN	-----c	113.7	115.3 ^a	118.0	116.0 ^b	117.4	117.6	116.8 ^a	118.3	112.6
	S.D. N	-----c	13.6 50	13.5 50	13.1 50	12.7 50	14.4 50	13.8 50	15.0 50	14.0 50	16.2 50
7	MEAN	-----c	116.7 ^b	116.4 ^b	117.0 ^a	116.6 ^b	118.7 ^a	118.3 ^a	118.6 ^a	122.0	120.5
	S.D. N	-----c	11.8 48	12.5 48	14.1 48	13.3 48	12.7 48	13.9 48	14.6 48	16.2 48	16.2 48
8	MEAN	-----c	114.3 ^a	114.1 ^b	114.8	114.1 ^a	114.9	115.8	115.6	115.3	112.9
	S.D. N	-----c	12.0 50	12.7 50	13.6 50	14.3 50	13.6 50	14.2 50	14.3 49	15.4 50	13.7 50
9	MEAN	-----c	114.0	113.4 ^b	113.4 ^a	112.4 ^b	111.9 ^b	113.1 ^a	110.9 ^a	113.2 ^b	111.6 ^b
	S.D. N	-----c	11.3 49	11.7 49	12.2 49	12.7 49	13.1 49	13.4 49	20.2 49	13.4 49	12.8 49
10	MEAN	-----c	118.8	120.1	120.1	-----c	120.1	119.2	119.6	120.5	117.2
	S.D. N	-----c	12.8 49	13.6 49	13.1 49	-----c	14.5 49	16.2 49	14.7 49	15.5 49	16.1 49
11	MEAN	-----c	115.3	116.0 ^a	116.7	-----c	118.5	119.1	119.5	118.3	117.3
	S.D. N	-----c	13.2 49	15.2 49	16.1 49	-----c	14.6 49	15.7 49	16.5 49	16.0 49	13.3 49

TABLE 19A (Continued)
 MEAN BODY WEIGHTS
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS
 FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
 MALES

GROUP NUMBER		STUDY WEEK									
		30	34	38	42	46	50	54	58	62	66
1	MEAN	119.7	119.3	115.6	116.9	118.0	117.6	112.7	115.8	119.7	120.3
	S.D. N	12.0 47	13.8 47	11.8 45	12.2 45	12.1 44	12.3 43	12.9 37	11.6 36	12.9 33	12.7 31
2	MEAN	115.9	114.5	113.2	114.5	115.9	114.2	113.7	115.2	116.0	119.3
	S.D. N	14.5 46	16.2 45	13.9 44	15.2 44	15.4 44	14.8 44	11.5 43	13.3 43	15.1 41	12.8 39
3	MEAN	107.4 ^b	104.0 ^b	104.7 ^b	103.6 ^b	105.0 ^b	110.4 ^b	102.8	109.0	107.1	113.1
	S.D. N	9.2 37	12.6 36	10.7 37	13.4 26	13.9 22	8.6 17	16.1 17	10.7 12	14.2 9	13.7 6
4	MEAN	116.4	114.5	112.9	114.0	115.6	119.4	118.6	117.1	122.9	119.5
	S.D. N	13.4 49	13.4 49	12.6 49	11.2 47	13.4 47	10.9 45	11.0 45	14.5 45	14.3 41	11.9 38
5	MEAN	112.1 ^a	112.8	112.2	113.7	114.2	112.3	109.1	114.3	112.2	115.4
	S.D. N	13.6 46	17.0 48	12.4 45	12.1 44	11.9 43	16.1 43	15.5 43	16.6 43	15.9 39	18.5 39
6	MEAN	113.4	112.6	110.3	112.4	113.2	115.2	113.5	114.8	113.8	114.3
	S.D. N	13.3 38	13.9 47	11.4 46	12.7 45	13.2 44	13.9 41	13.6 41	15.7 41	13.4 39	12.5 38
7	MEAN	118.9	119.8	118.0	115.4	117.7	119.8	113.3	116.8	117.8	119.6
	S.D. N	15.1 47	15.2 45	15.7 44	14.2 43	14.0 42	13.4 41	13.8 41	15.0 40	14.8 35	17.3 34
8	MEAN	113.2	113.6	106.4 ^a	109.4 ^a	107.0 ^b	110.0	110.6	115.2	116.0	117.6
	S.D. N	11.6 50	10.9 50	14.5 50	13.2 49	16.3 48	12.8 45	14.0 43	15.2 40	11.3 38	10.9 37
9	MEAN	113.3	112.7	106.5 ^b	106.1 ^b	107.3 ^b	107.6 ^b	108.7	114.8	114.6	113.0
	S.D. N	17.1 48	12.5 47	14.1 46	15.5 46	14.3 47	14.9 47	14.4 45	13.8 45	17.6 43	20.9 41
10	MEAN	119.2	116.6	109.7	109.7	112.2	112.3	104.5	117.9	122.1	123.1
	S.D. N	13.1 47	12.8 48	15.4 45	16.0 44	14.9 43	13.7 41	18.2 41	13.0 40	10.3 35	10.4 35
11	MEAN	114.6	114.0	103.4 ^b	107.7 ^b	108.4 ^b	110.5	108.7	116.3	116.8	121.1
	S.D. N	13.1 46	13.0 46	15.9 45	12.8 45	13.8 45	13.2 43	17.8 41	12.6 39	15.7 38	12.3 33

Reproduced from
 best available copy.

TABLE 19A (Continued)
 MEAN BODY WEIGHTS
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS
 FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)

MALES

GROUP NUMBER	STUDY WEEK C										
	70	74	78	82	85	90	94	98	102	111	
1	MEAN	122.8	118.5	118.3	115.7	116.6	113.4	114.2	116.1	119.0	
	S.D. N	11.2 29	15.4 28	13.1 26	16.9 22	14.0 19	9.2 14	10.6 7	11.9 7	9.5 4	
2	MEAN	120.6	118.6	119.1	119.6	116.2	113.4	106.8	112.6	117.9	
	S.D. N	14.6 39	14.8 35	16.0 34	12.2 30	13.5 30	10.4 20	13.2 12	15.5 10	10.1 7	
3	MEAN	109.9	114.2	128.2	-----d	-----d	-----d	-----d	-----d	-----d	
	S.D. N	13.5 5	16.1 3	0.0 1							
4	MEAN	119.7	118.7	120.8	120.1	121.9	116.2	113.2	116.9	120.5	
	S.D. N	16.3 38	17.6 36	13.8 33	13.2 31	13.0 29	13.8 25	17.1 22	6.9 16	12.3 13	
5	MEAN	115.0	120.5	118.1	114.1	116.4	112.7	106.3	102.8	117.1	
	S.D. N	15.3 35	15.7 30	15.0 28	16.9 27	15.0 24	13.6 20	10.6 17	14.8 10	12.0 7	
6	MEAN	117.6	121.3	118.2	115.5	117.3	114.3	109.4	114.2	121.3	
	S.D. N	13.0 32	10.2 28	11.5 27	12.9 23	13.3 23	23.9 21	16.0 17	15.7 12	14.5 11	
7	MEAN	123.9	123.9	122.4	122.3	117.8	115.8	114.0	118.6	119.1	
	S.D. N	14.0 31	15.0 29	14.2 25	14.1 24	13.8 23	14.2 20	17.8 17	11.1 12	15.6 5	
8	MEAN	119.2	119.5	118.0	118.2	114.8	112.3	109.5	109.0	118.8	
	S.D. N	14.1 33	11.6 36	10.4 33	12.0 30	14.9 28	22.8 24	12.3 16	13.4 13	7.4 10	
9	MEAN	118.4	118.0	115.3	118.4	120.6	114.1	106.5	116.1	106.3	
	S.D. N	17.1 37	16.6 32	19.3 26	17.6 22	25.4 21	14.4 19	16.3 17	9.0 9	2.7 2	
10	MEAN	122.7	120.3	119.7	117.2	116.5	115.7	109.7	107.9	113.3	
	S.D. N	10.0 33	11.9 30	13.1 26	14.2 26	13.7 23	14.4 20	13.8 18	13.4 10	9.4 5	
11	MEAN	122.2	125.0	122.2	121.9	120.3	114.0	112.0	107.9	116.8	
	S.D. N	13.4 31	12.1 30	16.6 28	12.4 26	14.8 25	16.9 24	16.3 19	12.7 13	9.5 6	

TABLE 19B
MEAN BODY WEIGHTS
CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS
FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
FEMALES

GROUP NUMBER		STUDY WEEK									
		1	2	3	4	5	6	7	8	9	10
1	MEAN	91.7	98.3	100.2	105.7	110.5	114.0	118.7	123.3	124.5	127.8
	S.D. N	6.6 48	6.5 48	7.2 48	12.4 48	10.6 48	13.1 48	12.4 48	12.1 48	12.9 48	13.3 48
2	MEAN	92.8	95.7	97.8	102.8	105.6 ^a	108.9	114.7 ^a	117.5 ^a	120.3	121.8 ^a
	S.D. N	7.2 50	7.3 50	8.3 50	9.3 50	10.1 50	10.7 50	9.7 50	10.8 50	11.0 50	11.6 50
3	MEAN	91.8	91.9 ^b	95.0 ^b	98.4 ^b	99.2 ^b	102.6 ^b	102.0 ^b	111.0 ^b	114.1 ^b	116.6 ^b
	S.D. N	8.5 50	8.9 50	9.3 50	13.3 50	11.5 49	13.1 49	13.2 49	13.4 49	13.7 49	13.7 49
4	MEAN	91.7	92.1 ^b	95.2 ^b	99.1 ^b	103.0 ^b	107.0 ^a	110.3 ^b	112.3 ^b	113.6 ^b	113.7 ^b
	S.D. N	8.6 49	8.5 49	8.3 49	8.8 49	9.9 49	10.0 49	11.0 49	10.8 49	10.8 49	12.3 48
5	MEAN	92.6	93.5 ^b	94.6 ^b	98.4 ^b	101.2 ^b	103.7 ^b	106.3 ^b	111.0 ^b	111.8 ^b	112.9 ^b
	S.D. N	7.2 50	7.6 50	8.1 50	10.1 50	9.5 50	11.0 50	11.3 50	11.6 50	12.5 50	13.3 50
6	MEAN	93.0	94.0 ^a	97.8	101.2	106.5	108.7	110.5 ^b	113.8 ^b	116.5 ^b	115.9 ^b
	S.D. N	9.2 49	7.7 49	12.2 49	13.6 48	11.2 48	12.1 48	13.1 48	14.4 48	13.5 48	14.1 48
7	MEAN	92.4	92.6 ^b	97.7	101.0 ^b	104.0 ^b	107.8 ^a	109.2 ^b	112.1 ^b	113.0 ^b	114.2 ^b
	S.D. N	8.5 50	8.1 50	8.6 50	10.0 50	10.9 50	10.7 50	12.6 50	13.5 50	14.4 50	14.5 50
8	MEAN	91.7	93.2	98.8	102.8	105.4	108.6	114.4	115.7 ^a	118.3	120.3 ^a
	S.D. N	7.9 48	8.1 48	7.8 49	10.4 48	12.0 48	12.2 48	11.9 48	12.1 48	14.1 48	13.8 48
9	MEAN	91.4	95.1 ^b	96.0 ^b	100.6 ^b	101.3 ^b	106.7 ^b	110.7 ^b	113.3 ^b	114.9 ^b	119.4 ^b
	S.D. N	8.0 47	5.9 47	10.8 47	8.3 47	10.2 47	10.3 47	10.9 47	10.5 47	11.7 47	11.9 47
10	MEAN	95.2	98.2	105.8	105.0	109.9	113.2	117.0	119.4 ^a	122.3	125.8
	S.D. N	7.5 47	8.6 47	9.5 47	8.6 47	9.0 47	10.2 47	11.5 47	12.1 47	12.0 47	13.3 47
11	MEAN	95.6	97.7	100.6	104.4 ^a	107.3 ^b	112.2	116.5 ^a	118.5 ^b	120.3 ^a	123.9 ^a
	S.D. N	7.7 48	8.7 48	9.7 48	10.1 48	10.8 48	12.6 48	13.4 48	14.3 48	13.3 48	16.2 46



TABLE 19B (Continued)
 MEAN BODY WEIGHTS
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS
 FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
 FEMALES

GROUP NUMBER		STUDY WEEK									
		11	12	13	14	15	16	17	18	22	26
1	MEAN	128.1	130.3	132.2	132.9	132.6	132.2	131.9	131.6	132.2	125.3
	S.D. N	13.6 48	14.8 48	15.3 48	15.5 48	14.9 48	14.1 48	14.6 48	15.4 48	14.6 48	15.8 48
2	MEAN	122.1 ^a	122.4	124.4	124.4	124.9	124.0	123.7	123.7	122.0 ^b	119.2
	S.D. N	11.5 50	12.7 50	12.4 50	12.1 50	12.5 50	11.8 50	13.1 50	13.0 50	18.1 49	12.7 48
3	MEAN	115.8 ^b	116.6 ^a	116.6 ^b	118.3 ^b	116.6 ^b	114.3 ^b	113.9 ^b	113.0 ^b	114.9 ^b	112.6 ^b
	S.D. N	14.6 47	14.8 47	15.6 48	14.3 48	16.0 48	16.3 48	16.0 48	18.5 48	19.4 47	18.9 45
4	MEAN	114.4 ^b	114.6 ^a	----- ^c	118.6 ^a	118.8 ^a	119.4 ^a	118.7 ^a	117.5 ^a	122.9 ^a	116.1
	S.D. N	14.0 48	15.4 48	----- ^c	14.1 48	14.5 48	14.6 48	15.3 48	14.5 47	16.2 47	16.0 47
5	MEAN	115.5 ^b	116.3 ^b	----- ^c	116.8 ^b	119.6 ^b	119.7 ^b	120.4 ^b	118.7 ^b	123.4 ^a	116.9
	S.D. N	13.7 47	14.1 47	----- ^c	14.0 47	14.9 47	15.0 44	14.9 43	15.2 43	15.8 42	17.7 42
6	MEAN	----- ^c	118.6 ^b	120.5 ^a	121.7 ^a	121.9 ^a	123.0	123.0 ^a	123.7	123.9	118.9
	S.D. N	----- ^c	13.1 48	14.4 48	14.7 48	15.9 48	16.3 48	15.7 48	15.4 48	18.9 48	18.3 48
7	MEAN	----- ^c	117.6 ^b	119.5 ^b	119.7 ^b	118.2 ^b	121.7 ^b	120.3 ^b	119.8 ^b	120.9 ^b	118.9
	S.D. N	----- ^c	15.0 50	14.7 50	15.9 50	16.6 50	16.0 47	17.3 49	18.4 49	18.8 49	15.2 49
8	MEAN	----- ^c	124.3	122.9	123.9	123.0 ^a	122.7	123.5	122.2	122.2 ^a	115.9 ^a
	S.D. N	----- ^c	13.4 48	15.1 48	15.5 48	15.4 49	14.6 48	15.8 48	15.4 46	14.7 48	14.5 48
9	MEAN	----- ^c	124.0	124.5	125.0	122.5 ^b	122.9 ^a	123.2	123.0	125.3 ^a	119.5
	S.D. N	----- ^c	13.5 47	13.7 47	13.6 47	14.3 47	14.2 47	16.3 47	16.8 47	15.2 47	15.2 47
10	MEAN	----- ^c	126.1	126.9	126.9	----- ^c	127.8	127.0	127.1	124.9 ^a	118.5 ^a
	S.D. N	----- ^c	13.8 47	15.7 47	16.4 47	----- ^c	16.7 48	16.7 48	18.4 46	20.5 46	18.9 45
11	MEAN	----- ^c	124.8	127.3	127.4	----- ^c	128.7	129.8	128.6	127.6	121.9
	S.D. N	----- ^c	17.3 46	17.3 46	17.7 46	----- ^c	17.7 46	16.5 46	17.6 46	17.3 46	17.1 46

TABLE 19B (Continued)
 MEAN BODY WEIGHTS
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS
 FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
 FEMALES

GROUP NUMBER		STUDY WEEK									
		30	34	38	42	46	50	54	58	62	66
1	MEAN	122.7	117.6	117.7	118.1	114.6	112.3	111.3	114.0	117.7	117.5
	S.D. N	16.1 48	17.3 48	12.8 46	13.4 45	15.0 45	13.9 44	10.4 42	11.6 41	10.3 35	12.8 32
2	MEAN	117.0	114.6	110.0 ^b	109.8 ^b	109.2	107.0	110.9	109.5	111.6	112.7
	S.D. N	12.4 48	13.8 48	10.4 47	11.9 47	12.5 47	12.3 43	11.3 38	14.5 36	13.2 34	13.9 31
3	MEAN	112.7 ^a	110.0	108.2	110.2	103.8	103.6	108.6	101.9	107.0	102.2
	S.D. N	19.4 43	19.1 41	18.3 39	13.5 33	16.4 31	16.7 30	15.1 25	15.8 22	16.0 16	21.7 15
4	MEAN	115.7	114.2	112.0	110.7	111.7	110.5	109.6	112.0	114.8	114.2
	S.D. N	15.7 46	15.1 46	15.0 45	15.6 46	16.1 44	12.6 43	13.6 42	13.0 42	14.3 36	14.6 36
5	MEAN	109.8 ^b	109.8	108.4 ^b	108.8 ^a	110.8	107.3	107.0	111.2	108.1 ^a	112.8
	S.D. N	16.5 42	14.2 40	12.4 38	12.8 38	12.7 36	14.1 35	12.8 34	12.8 34	14.4 30	15.6 28
6	MEAN	116.2	113.9	112.4	111.0	112.8	112.1	110.3	115.3	113.9	112.0
	S.D. N	18.3 47	19.1 47	17.9 46	15.6 45	14.6 44	15.7 43	21.7 42	21.9 41	24.0 38	17.7 32
7	MEAN	117.6	115.8	110.9	111.5	112.2	111.4	98.2 ^b	111.5	115.0	115.8
	S.D. N	14.7 49	14.4 48	11.3 45	11.1 46	10.9 46	10.9 45	15.2 45	12.8 45	13.2 42	15.5 36
8	MEAN	114.1 ^a	113.1	102.9 ^b	107.1 ^b	105.6	106.8	108.1	112.8	117.0	112.7
	S.D. N	12.8 47	15.3 46	20.3 44	12.6 42	15.7 41	14.4 40	16.2 38	10.8 35	13.1 30	14.9 27
9	MEAN	115.4 ^a	115.3	106.3 ^b	110.0 ^a	109.4	108.0	97.5 ^b	111.8	112.0	114.2
	S.D. N	14.9 47	15.4 46	18.5 45	16.3 45	12.9 44	11.0 41	19.5 40	10.7 37	15.3 34	11.1 27
10	MEAN	115.2 ^a	115.0	106.6 ^b	110.2 ^b	110.4	110.2	106.1	114.4	113.6	117.3
	S.D. N	18.2 45	14.8 43	17.3 43	12.4 41	15.9 41	13.9 39	18.6 38	12.8 37	18.1 37	13.6 32
11	MEAN	121.2	119.5	111.7 ^a	110.4 ^b	111.1 ^a	110.4	106.0 ^b	115.9	114.1	111.3
	S.D. N	16.0 45	18.7 45	18.5 43	13.6 41	12.7 41	12.5 41	14.9 41	10.1 41	15.9 40	19.7 30

TABLE 19B (Continued)
 MEAN BODY WEIGHTS
 CARCINOGENIC POTENTIAL OF CONDENSED PYROLYSIS EFFLUENTS
 FROM IRON FOUNDRY CASTING OPERATIONS (CHRONIC STUDY)
 FEMALES

GROUP NUMBER		STUDY WEEK									
		70	74	79	82	85	90	94	98	102	
1	MEAN	118.8	114.7	110.1	112.6	109.4	106.9	107.5	110.7	116.3	
	S.D. N	10.8 31	14.5 26	14.9 17	12.8 12	9.4 10	9.5 6	27.9 4	7.2 2	16.5 2	
2	MEAN	116.3	117.5	117.4	112.4	112.1	102.4	104.0	105.1	106.9	
	S.D. N	11.6 26	12.0 21	14.0 21	13.0 17	13.9 12	18.5 11	16.3 7	14.0 5	15.8 4	
3	MEAN	113.8	102.3	100.0	100.9	106.9	90.7				
	S.D. N	16.5 10	22.0 8	22.7 7	24.1 4	23.0 3	0.0 1				
4	MEAN	113.3	115.8	116.2	117.0	112.5	112.0	110.8	111.2	107.6	
	S.D. N	13.9 27	14.4 24	14.5 23	11.0 18	15.4 17	14.6 12	17.7 11	28.5 10	12.8 9	
5	MEAN	115.4	117.7	114.2	113.5	116.3	111.0	107.1	112.0	108.3	
	S.D. N	14.8 27	15.0 25	15.1 22	12.3 17	12.3 15	10.4 12	15.3 9	9.9 5	15.4 5	
6	MEAN	116.7	120.1	113.4	103.0	106.9	116.6	112.7	111.0	111.2	
	S.D. N	25.4 30	20.3 25	21.8 21	12.0 14	17.1 10	26.4 7	11.9 4	10.5 3	11.8 3	
7	MEAN	118.3	112.7	116.6	117.3	111.9	110.8	109.9	103.7	106.4	
	S.D. N	16.0 33	14.7 26	13.8 21	10.6 19	15.4 14	13.8 11	21.1 9	13.6 7	20.4 5	
8	MEAN	113.2	117.4	109.6	110.3	105.2	105.9	103.1	104.3	105.0	
	S.D. N	18.5 24	10.0 21	15.8 18	12.0 16	17.3 15	15.6 10	19.6 8	21.1 4	12.2 3	
9	MEAN	117.1	113.5	110.1	110.0	118.2	116.9	115.7	107.8	115.0	
	S.D. N	11.0 20	15.4 18	19.6 12	19.3 10	13.2 8	14.4 8	15.1 3	6.9 4	14.8 2	
10	MEAN	117.4	116.2	114.3	114.2	110.1	113.2	111.7	108.1	113.9	
	S.D. N	17.4 26	26.3 22	26.5 17	29.4 15	18.8 13	9.7 8	12.0 4	4.1 2	6.0 1	
11	MEAN	120.4	121.8	119.1	117.4	121.1	111.6	102.5	84.7	103.0	
	S.D. N	12.4 21	14.0 16	13.7 12	14.6 10	27.2 7	12.6 3	1.8 2	15.9 2	1.8 2	

Reproduced from
 best available copy.