Shaughnessy #: 009001

EAB Log-Out Date: MAR 21 1988

To: George LaRocca
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Registration Division (TS-767C)

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Thru: Paul F. Schuda, Chief
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Attached, please find the EAB review of...

Reg./File No.: 52904-C

Chemical: Lindane

Type Product: Insecticide

Product Name: Prentox

Company Name: Rhone-Poulenc

Submission Purpose: Applicator exposure study

Date In: 4 NOV 86

ACTION CODE: 660

Date Completed: MAR 21 1988

EAB #: 70068

Deferrals To:

/ / Ecological Effects Branch

/ / Residue Chemistry Branch

/ / Toxicology Branch

/ / Benefits and Use Division

Monitoring study requested by EAB: / /

Monitoring study voluntarily conducted by registrant: / /

1.0 INTRODUCTION

Orius Associates, on behalf of Rhone-Poulenc and the Centre International d'Etudes du Lindane (CIEL), has submitted a worker exposure study in response to data requirements contained in the Lindane Registration Standard issued September 30, 1985.

2.0 MATERIALS AND METHODS

Three emulsifiable concentrate formulations of lindane (11.14 - 20% EC; 0.887 - 1.63 lb ai/gal) were applied to swine by workers using a hose-siphon sprayer, pump-up hand sprayer, or high volume hydraulic handgun sprayer. The swine were treated in open-front sheds or in environmentally controlled closed buildings. Dermal and respiratory exposure to workers was monitored for 12 replicates comprised of mixing, loading, application and clean up (combined tasks). Monitoring was performed at three sites.

During each monitoring period, workers wore Tyvek coveralls, rubber boots, face shields, water resistant hats, and chemical resistant gloves. Label instructions require the use of a respirator only during application in enclosed areas such as crawl spaces.

Dermal exposure was measured using multilayer patches constructed of Tyvek (outer layer), cloth from conventional work clothing (middle layer), and chromatography paper backed with glassine (inner layer). The layers were encased in a foil frame with an approximately 85-cm^2 window. Lindane residues on the inner layer, representing the penetration of residues through Tyvek coveralls and work clothing, were used to estimate worker exposure in this assessment. Forearm dosimeters did not include the middle layer of work clothing in order to simulate the wearing of short-sleeved shirts.

Dermal patches were placed in the following locations: left and right shoulders; left and right forearms; chest; back; left and right thighs; and left and right lower legs. Foot exposure was measured using the inner set of two pairs of socks. Hand exposure was measured by hand rinses in soapy distilled water and distilled water, followed by a dry paper towel and three final rinses with isopropyl alcohol.

Exposure to the face and neck was measured by swabbing 22-cm^2 areas on the workers' forehead, left and right cheeks, and throat. Each area was swabbed four times as follows: swab moistened with soapy distilled water, swab moistened with distilled water, dry paper towel, and swab moistened with 10% isopropyl alcohol in distilled water. For inhalation exposure monitoring, breathing zone air samples were taken using personal air samplers equipped with 600-mg charcoal tubes and operating at 1.0 L/min.

3.0 ANALYTICAL METHODS AND QUALITY ASSURANCE PROCEDURES

All samples were maintained frozen until analysis. Samples were extracted with hexane or hexane:acetone (1:1) for analysis using gas chromatography with electron capture detection. The lower limit of sensitivity for the method was: 0.1 ug for paper towels, charcoal filters, dermal patches (chromatography paper and glassine), socks, and swabs; 1 ug/L for distilled water and isopropyl alcohol; and 3 ug/L for soapy distilled water. Recovery of lindane from samples spiked in the laboratory is shown in Table 1. Field control samples included all sampling media, and were set up during each of the 12 replicates. Each control set included one blank control, one sample spiked with 25 uL of finished spray and one sample spiked with 100 uL of finished spray (handwashes and charcoal tubes were spiked at 50 and 200 uL and 5 and 15 uL, respectively). Recovery of lindane from these samples is shown in Table 2.

4.0 CALCULATION OF EXPOSURES

Dermal exposure values were calculated by dividing the amount of lindane on the inner layer of the dermal patches by the surface area of the patch (85 cm^2), and then multiplying the result by the surface area (cm^2) of the body region which each patch represented. This result (ug/body part) was then adjusted by the application time, applicator body weight, and the amount of lindane sprayed. The latter adjustment was made for individual exposure calculations instead of mg/lb ai handled, since two workers loaded more ai than they sprayed and two workers sprayed more than they loaded. Average exposure values for all replicates, however, represent mg lindane/lb ai handled.

All exposures determined to be below analytical detection were considered as positive at half the detection limit for calculation purposes. The dermal exposure values are provided in Table 3.

Inhalation exposure values were calculated by multiplying the residue found on the charcoal filters (adjusted for recovery) at a flow rate of 1 L/min by 29 L/min, the ventilation rate for light work. This result was then divided by the lb ai handled to present respiratory exposure in ug/lb ai. The inhalation exposure values are provided in Table 4.

5.0 RESULTS

Three types of application equipment were used in this study, hose-siphon sprayers, pump-up hand sprayers, and high-volume hydraulic handgun sprayers. Exposure estimates have been provided for each type of equipment for both dermal and inhalation exposure.

Dermal Exposure

The mean exposure was calculated to be: 33.9 mg/lb ai for the four hose-siphon sprayers; 8.0 mg/lb ai for the two pump-up hand sprayers; and 1.4 mg/lb ai for the six high volume hydraulic handgun sprayers. Assuming a 70 kg individual, exposure is estimated to be: 0.48 mg/kg/lb ai for hose-siphon sprayers; 0.11 mg/kg/lb ai for pump-up hand sprayers; and 2.1×10^{-2} mg/kg/lb ai for high-volume hydraulic handgun sprayers.

Inhalation Exposure

The mean exposure was calculated to be: 0.27 mg/lb ai for hose-siphon sprayers; 0.66 mg/lb ai for pump-up hand sprayers; and 0.23 mg/lb ai for high-volume hydraulic handgun sprayers. Assuming a 70 kg individual, exposure is estimated to be: 3.8×10^{-3} mg/kg/lb ai for hose-siphon sprayers; 9.5×10^{-3} mg/kg/lb ai for pump-up hand sprayers; and 3.3×10^{-3} mg/kg/lb ai for high-volume hydraulic handgun sprayers.

6.0 CONCLUSIONS

Dermal and inhalation exposure to workers spraying lindane on penned swine have been estimated to be:

Dermal Exposure

Hose-Siphon - 0.48 mg/kg/lb ai
Pump-Up - 0.11 mg/kg/lb ai
High-Volume - 2.1×10^{-2} mg/kg/lb ai

Inhalation Exposure

Hose-Siphon - 3.8×10^{-3} mg/kg/lb ai
Pump-Up - 9.5×10^{-3} mg/kg/lb ai
High-Volume - 3.3×10^{-3} mg/kg/lb ai

These estimates assume that one person performs all mixing/loading, application and clean-up activities. No corrections have been made for dermal absorption.

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Table 1. Recovery of lindane from media fortified in the laboratory.[a]

Matrix	Spiking level (ug)	Recovery range (%)	Mean recovery (%)
Chromatography paper	0.1 - 10	86 - 132	100
Face towels	0.1 - 400	68 - 107	93
Hand towels	0.1 - 100	89 - 129	110
Charcoal filters	0.1 - 20	82 - 143	93
Swabs	0.1 - 100	82 - 120	97
Isopropyl alcohol	1.0 - 200	88 - 117	98
Distilled water	1.0 - 200	84 - 103	93
Soapy distilled water	0.1 & 200	67 - 122	93
Socks	1.0 - 100	94 - 120	104

[a] No lindane was detected on untreated laboratory control samples. Limits of detection for the method were 0.1 ug for paper towels, charcoal filters, dermal patches (chromatography paper/glassine), socks, and swabs, 1 ug/L for distilled water and isopropyl alcohol, and 3 ug/L for soapy distilled water.

Table 2. Recovery of lindane residues from field controls.

Matrix	Field blanks (ug)		Field spikes (% of applied)	
	Range	Mean	Range	Mean
Chrom. paper	0 - 0.087	0.007	12 - 72	46
Socks	0 - 3.647	0.651	2 - 70	48
Char. filters	0	0	76 - 342	119
Face swabs (soapy water)	0	0	69 - 133	95
Face swabs (dist. water)	0	0	1 - 253	70
Face swabs (IPA)	0.029 - 0.579	0.129	67 - 101	81
Paper towels	0 - 0.647	0.244	12 - 32	22
Soapy water	0 - 3.029	0.252	43 - 161	88
Distilled water	0	0	36 - 158	92
Isopropyl alcohol	0	0	59 - 127	98

Table 3: Dermal Exposure to Lindane

Day 1, Replicate 1

Total lb ai handled: 0.028

Application equipment: Hose-siphon sprayer

Body Area	Patch Size (cm^2)	Adjusted ug/patch	Adjusted ug/cm^2	Body Surface Area (cm^2)	Total ug
Chest	94.08	0.58	0.0062	3550	21.9
Back	86.48	65.05	0.75	3550	2670.0
L. Upper Arm	89.24	0.80	0.0090	1455	50.9
	92.15	5.58	0.0606>0.035		
R. Upper Arm	94.05	0.80	0.0085	1455	48.9
	94.06	5.58	0.0587>0.034		
L. Forearm	92.15	5.58	0.0606	605	36.7
R. Forearm	95.06	5.58	0.0587	605	35.5
L. Thigh	117.6	0.28	0.0024	1910	4.5
R. Thigh	165.0	0.28	0.0017	1910	3.2
L. Shin	94.09	20.28	0.216	1190	256.5
R. Shin	97.02	20.28	0.209	1190	248.7
Face[a]	78.00	3.84	0.049	800	39
Hands	-----	----	-----	---	54
Total Dermal Exposure (ug)					3470
Exposure (mg/lb ai)					124

[a]Includes the "v" of the chest.

Table 3: Dermal Exposure to Lindane (Cont.)

Day 2, Replicate 2

Total lb ai handled: 0.024

Application equipment: Pump-up hand sprayer

Body Area	Patch Size (cm^2)	Adjusted ug/patch	Adjusted ug/cm^2	Body Surface Area (cm^2)	Total ug
Chest	94.05	0.61	0.0065	3550	23.0
Back	96.00	0.11	0.0011	3550	4.1
L. Upper Arm	82.80	0.47	0.0057	1455	7.1
	89.28	0.36	0.0040>0.0049		
R. Upper Arm	99.00	0.47	0.0047	1455	6.1
	95.06	0.36	0.0038>0.0042		
L. Forearm	89.28	0.36	0.0040	605	2.4
R. Forearm	95.06	0.36	0.0038	605	2.3
L. Thigh	97.02	0.11	0.0011	1910	2.2
R. Thigh	88.36	0.11	0.0012	1910	2.4
L. Shin	100.00	1.72	0.0172	1190	20.5
R. Shin	99.00	1.72	0.0174	1190	20.7
Face[a]	78.00	1.62	0.0208	800	16.6
Hands	-----	----	------	---	1.8
Total Dermal Exposure (ug)					109.2
Exposure (mg/lb ai)					4.6

[a]Includes the "v" of the chest.

Table 3: Dermal Exposure to Lindane (Cont.)

Day 3, Replicate 3

Total lb ai handled: 0.028

Application equipment: Hose-siphon sprayer

Body Area	Patch Size (cm^2)	Adjusted ug/patch	Adjusted ug/cm^2	Body Surface Area (cm^2)	Total ug
Chest	90.25	0.11	0.0012	3550	4.3
Back	89.18	0.11	0.0012	3550	4.4
L. Upper Arm	87.30	0.10	0.0011	1455	9.4
	88.35	1.04	0.0118>0.0064		
R. Upper Arm	96.04	0.10	0.0010	1455	9.8
	83.70	1.04	0.0124>0.0067		
L. Forearm	88.35	1.04	0.0118	605	7.1
R. Forearm	83.70	1.04	0.0124	605	7.5
L. Thigh	93.10	0.10	0.0011	1910	2.1
R. Thigh	121.00	0.10	0.0008	1910	1.6
L. Shin	99.99	0.16	0.0016	1190	1.9
R. Shin	114.45	0.16	0.0014	1190	1.7
Face[a]	78.00	1.51	0.019	800	15.5
Hands	-----	----	------	---	44.2
Total Dermal Exposure (ug)					110
Exposure (mg/lb ai)					3.9

[a]Includes the "v" of the chest.

Table 3: Dermal Exposure to Lindane (Cont.)

Day 3, Replicate 4

Total lb ai handled: 0.433

Application equipment: High-volume hydraulic handgun sprayer

Body Area	Patch Size (cm^2)	Adjusted ug/patch	Adjusted ug/cm^2	Body Surface Area (cm^2)	Total ug
Chest	87.42	4.63	0.053	3550	188.0
Back	88.32	0.59	0.0067	3550	23.7
L. Upper Arm	88.35	0.81	0.0092	1455	65.0
	85.56	6.86	0.0802>0.045		
R. Upper Arm	93.10	0.81	0.0087	1455	64.7
	85.56	6.86	0.0802>0.044		
L. Forearm	85.56	6.86	0.0802	605	48.5
R. Forearm	85.56	6.86	0.0802	605	48.5
L. Thigh	117.52	0.30	0.0026	1910	4.9
R. Thigh	116.55	0.30	0.0026	1910	4.9
L. Shin	94.09	5.29	0.0562	1190	66.9
R. Shin	114.49	5.29	0.0462	1190	55.0
Face[a]	78.00	7.81	0.1001	800	80.1
Hands	-----	----	------	---	18.0
Total Dermal Exposure (ug)					668.2
Exposure (mg/lb ai)					1.5

[a]Includes the "v" of the chest.

Table 3: Dermal Exposure to Lindane (Cont.)

Day 3, Replicate 5

Total lb ai handled: 0.434

Application equipment: High-volume hydraulic handgun sprayer

Body Area	Patch Size (cm^2)	Adjusted ug/patch	Adjusted ug/cm^2	Body Surface Area (cm^2)	Total ug
Chest	88.36	2.54	0.029	3550	102.0
Back	91.18	1.85	0.020	3550	72.0
L. Upper Arm	86.33	1.33	0.015	1455	47.7
	90.21	4.56	0.051>0.033		
R. Upper Arm	85.50	1.33	0.016	1455	47.3
	93.12	4.56	0.049>0.032		
L. Forearm	90.21	4.56	0.051	605	30.6
R. Forearm	93.12	4.56	0.049	605	29.6
L. Thigh	115.54	1.14	0.0099	1910	18.8
R. Thigh	112.35	1.14	0.0101	1910	19.4
L. Shin	112.20	3.02	0.0269	1190	32.0
R. Shin	114.40	3.02	0.0264	1190	31.4
Face[a]	78.00	3.28	0.0421	800	33.6
Hands	-----	----	------	---	29.8
Total Dermal Exposure (ug)					494.2
Exposure (mg/lb ai)					1.1

[a]Includes the "v" of the chest.

Table 3: Dermal Exposure to Lindane (Cont.)

Day 4, Replicate 6

Total lb ai handled: 0.042

Application equipment: Hose-siphon sprayer

Body Area	Patch Size (cm^2)	Adjusted ug/patch	Adjusted ug/cm^2	Body Surface Area (cm^2)	Total ug
Chest	87.30	1.10	0.013	3550	44.7
Back	99.99	0.28	0.0028	3550	9.9
L. Upper Arm	88.36	1.63	0.0184	1455	19.6
	96.96	0.83	0.0086>0.0135		
R. Upper Arm	94.09	1.63	0.0173	1455	19.8
	83.70	0.83	0.0099>0.0136		
L. Forearm	96.96	0.83	0.086	605	5.2
R. Forearm	83.70	0.83	0.0099	605	6.0
L. Thigh	104.00	0.19	0.0018	1910	3.5
R. Thigh	107.00	0.19	0.0018	1910	3.4
L. Shin	100.98	4.14	0.0410	1190	48.8
R. Shin	96.03	4.14	0.0431	1190	51.3
Face[a]	78.00	3.61	0.0463	800	37.0
Hands	-----	----	------	---	30.7
Total Dermal Exposure (ug)					279.9
Exposure (mg/lb ai)					6.7

[a]Includes the "v" of the chest.

Table 3: Dermal Exposure to Lindane (Cont.)

Day 5, Replicate 7

Total lb ai handled: 0.055

Application equipment: Hose-siphon sprayer

Body Area	Patch Size (cm^2)	Adjusted ug/patch	Adjusted ug/cm^2	Body Surface Area (cm^2)	Total ug
Chest	90.25	0.11	0.0012	3550	4.3
Back	89.24	0.11	0.0012	3550	4.4
L. Upper Arm	90.16	0.11	0.0012	1455	3.0
	87.36	0.26	0.0030>0.0021		
R. Upper Arm	91.18	0.11	0.0012	1455	3.3
	78.32	0.26	0.0033>0.0023		
L. Forearm	87.36	0.26	0.0030	605	1.8
R. Forearm	78.32	0.26	0.0033	605	2.0
L. Thigh	117.60	0.11	0.0009	1910	1.8
R. Thigh	112.27	0.11	0.0010	1910	1.9
L. Shin	126.56	0.28	0.0022	1190	2.6
R. Shin	113.30	0.28	0.0025	1190	2.9
Face[a]	78.00	0.80	0.0103	800	8.2
Hands	-----	----	------	---	18.3
Total Dermal Exposure (ug)					54.5
Exposure (mg/lb ai)					1.0

[a]Includes the "v" of the chest.

Table 3: Dermal Exposure to Lindane (Cont.)

Day 5, Replicate 8

Total lb ai handled: 0.631

Application equipment: High-volume hydraulic handgun sprayer

Body Area	Patch Size (cm^2)	Adjusted ug/patch	Adjusted ug/cm^2	Body Surface Area (cm^2)	Total ug
Chest	93.10	8.87	0.095	3550	338.2
Back	95.04	2.63	0.028	3550	98.2
L. Upper Arm	115.56	7.58	0.0656	1455	118.9
	85.50	8.37	0.0979>0.0817		
R. Upper Arm	109.20	7.58	0.0694	1455	116.6
	92.15	8.37	0.0908>0.0801		
L. Forearm	85.50	8.37	0.0979	605	59.2
R. Forearm	92.15	8.37	0.0908	605	54.9
L. Thigh	100.00	5.36	0.0536	1910	102.4
R. Thigh	107.10	5.36	0.0500	1910	95.6
L. Shin	98.94	3.01	0.0304	1190	36.2
R. Shin	100.94	3.01	0.0298	1190	35.5
Face[a]	78.00	58.79	0.7541	800	603.0
Hands	-----	----	------	---	120.4
Total Dermal Exposure (ug)					1779.1
Exposure (mg/lb ai)					2.8

[a]Includes the "v" of the chest.

Table 3: Dermal Exposure to Lindane (Cont.)

Day 5, Replicate 9

Total lb ai handled: 0.713

Application equipment: High-volume hydraulic handgun sprayer

Body Area	Patch Size (cm^2)	Adjusted ug/patch	Adjusted ug/cm^2	Body Surface Area (cm^2)	Total ug
Chest	95.04	2.46	0.0259	3550	91.9
Back	96.00	1.23	0.0128	3550	45.5
L. Upper Arm	88.35	1.16	0.0131	1455	44.4
	95.04	4.55	0.0479 >0.0305		
R. Upper Arm	89.28	1.16	0.0130	1455	45.4
	92.15	4.55	0.0494 >0.0312		
L. Forearm	95.04	4.55	0.0479	605	29.0
R. Forearm	92.15	4.55	0.0494	605	29.9
L. Thigh	111.24	0.84	0.0076	1910	14.4
R. Thigh	122.08	0.84	0.0069	1910	13.1
L. Shin	111.28	2.16	0.0194	1190	23.1
R. Shin	98.00	2.16	0.0220	1190	26.2
Face[a]	78.00	9.32	0.1195	800	95.6
Hands	-----	----	------	---	124.0
Total Dermal Exposure (ug)					582.5
Exposure (mg/lb ai)					0.82

[a]Includes the "v" of the chest.

Table 3: Dermal Exposure to Lindane (Cont.)

Day 6, Replicate 10

Total lb ai handled: 0.866

Application equipment: High-volume hydraulic handgun sprayer

Body Area	Patch Size (cm^2)	Adjusted ug/patch	Adjusted ug/cm^2	Body Surface Area (cm^2)	Total ug
Chest	109.14	6.21	0.0569	3550	202.0
Back	105.06	1.16	0.0110	3550	39.2
L. Upper Arm	120.96	1.98	0.0164	1455	38.9
	86.48	3.21	0.0371 >0.0268		
R. Upper Arm	112.32	1.98	0.0176	1455	37.1
	96.00	3.21	0.0334 >0.0255		
L. Forearm	86.48	3.21	0.0371	605	22.4
R. Forearm	96.00	3.21	0.0334	605	20.2
L. Thigh	98.00	1.33	0.0136	1910	25.9
R. Thigh	97.00	1.33	0.0137	1910	26.2
L. Shin	97.02	1.81	0.0187	1190	22.2
R. Shin	99.96	1.81	0.0181	1190	21.5
Face[a]	78.00	6.88	0.0882	800	70.6
Hands	-----	----	------	---	19.4
Total Dermal Exposure (ug)					546.6
Exposure (mg/lb ai)					0.63

[a]Includes the "v" of the chest.

Table 3: Dermal Exposure to Lindane (Cont.)

Day 6, Replicate 11

Total lb ai handled: 0.815

Application equipment: High-volume hydraulic handgun sprayer

Body Area	Patch Size (cm^2)	Adjusted ug/patch	Adjusted ug/cm^2	Body Surface Area (cm^2)	Total ug
Chest	111.18	10.46	0.0941	3550	334.0
Back	122.10	4.19	0.0343	3550	121.8
L. Upper Arm	114.48	5.81	0.0508	1455	163.6
	90.24	15.71	0.1741>0.112		
R. Upper Arm	110.25	5.81	0.0527	1455	161.1
	93.10	15.71	0.1687>0.111		
L. Forearm	90.24	15.71	0.1741	605	105.3
R. Forearm	93.10	15.71	0.1687	605	102.1
L. Thigh	100.00	3.73	0.0373	1910	71.2
R. Thigh	101.85	3.73	0.0366	1910	69.9
L. Shin	100.98	3.28	0.0325	1190	38.7
R. Shin	104.94	3.28	0.0313	1190	37.2
Face[a]	78.00	13.43	0.1722	800	137.7
Hands	-----	----	------	---	85.0
Total Dermal Exposure (ug)					1427.6
Exposure (mg/lb ai)					1.8

[a]Includes the "v" of the chest.

Table 3: Dermal Exposure to Lindane (Cont.)

Day 7, Replicate 12

Total lb ai handled: 0.024

Application equipment: Pump-up hand sprayer

Body Area	Patch Size (cm^2)	Adjusted ug/patch	Adjusted ug/cm^2	Body Surface Area (cm^2)	Total ug
Chest	112.36	3.20	0.028	3550	101.1
Back	115.56	0.46	0.0040	3550	14.1
L. Upper Arm	114.40	0.62	0.0054	1455	26.9
	90.21	2.85	0.0316>0.018		
R. Upper Arm	116.63	0.62	0.0053	1455	26.6
	91.18	2.85	0.0313>0.018		
L. Forearm	90.21	2.85	0.0316	605	19.1
R. Forearm	91.18	2.85	0.0313	605	18.9
L. Thigh	97.00	0.89	0.0092	1910	17.5
R. Thigh	111.30	0.89	0.0080	1910	15.3
L. Shin	99.91	0.97	0.0097	1190	11.6
R. Shin	99.91	0.97	0.0097	1190	11.6
Face[a]	78.00	0.50	0.0064	800	5.2
Hands	-----	----	------	---	6.2
Total Dermal Exposure (ug)					274.1
Exposure (mg/lb ai)					11.4

[a]Includes the "v" of the chest.

Table 3: Dermal Exposure to Lindane (cont.)

SUMMARY

Hose-siphon sprayer

Replicate	Exposure (mg/lb ai)	(mg/kg/lb ai)
1	124	1.77
3	3.9	0.056
6	6.7	0.096
7	1.0	0.014
MEAN EXPOSURE	33.9	0.48

Pump-up hand sprayer

Replicate	Exposure (mg/lb ai)	(mg/kg/lb ai)
2	4.6	0.066
12	11.4	0.16
MEAN EXPOSURE	8.0	0.11

High-volume hydraulic handgun sprayer

Replicate	Exposure (mg/lb ai)	(mg/kg/lb ai)
4	1.5	0.021
5	1.1	0.016
8	2.8	0.040
9	0.82	0.012
10	0.63	0.0090
11	1.8	0.026
MEAN EXPOSURE	1.4	0.021

Table 4: Inhalation Exposure to Lindane

Replicate	Adjusted ug/sample[a]	Adjusted ug[b]	lb ai handled	ug/lb ai
1	0.43	12.47	0.028	445.36
2	0.38	11.02	0.024	459.17
3	0.08	2.32	0.028	82.86
4	2.24	64.96	0.433	150.02
5	3.80	110.20	0.434	253.92
6	0.73	21.17	0.042	504.05
7	0.08	2.32	0.055	42.18
8	12.29	356.41	0.631	564.83
9	4.49	130.21	0.713	182.62
10	3.67	106.43	0.866	122.90
11	3.32	96.28	0.815	118.13
12	0.72	20.88	0.024	870.00

[a]Based on a flow rate of 1.0 L/min.
[b]Based on a ventilation rate of 29 L/min (light work).

Table 4: Inhalation Exposure to Lindane (cont.)

SUMMARY

Hose-siphon sprayer

Replicate	Exposure (mg/lb ai)	(mg/kg/lb ai)
1	0.45	0.0064
3	0.083	0.0012
6	0.50	0.0072
7	0.042	0.00060
MEAN EXPOSURE	0.27	0.0038

Pump-up hand sprayer

Replicate	Exposure (mg/lb ai)	(mg/kg/lb ai)
2	0.46	0.0066
12	0.87	0.012
MEAN EXPOSURE	0.66	0.0095

High-volume hydraulic handgun sprayer

Replicate	Exposure (mg/lb ai)	(mg/kg/lb ai)
4	0.15	0.0021
5	0.25	0.0036
8	0.56	0.0081
9	0.18	0.0026
10	0.12	0.0018
11	0.12	0.0017
MEAN EXPOSURE	0.23	0.0033