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PPG INDUSTRIES, INC.
INDUSTRIAL CHEMICAL DIVISION
LAKE CHARLES, LOUISIANA

LD 1121G

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WOOD, M W

CONTINUING PROGRAM OF MONITORING ATMOSPHERIC
CONTAMINANTS WITHIN THE LAKE CHARLES PLANT

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LABORATORY DEPARTMENT
MARK W. WOOD

TECHNICAL REPORT
AUGUST 9, 1974

CONTINUING PROGRAM OF MONITORING ATMOSPHERIC
CONTAMINANTS WITHIN THE LAKE CHARLES' PLANT
LD-1121G

ABSTRACT

The tables composing this report are continuations of occupational environment surveys started early in 1969 and contain data from various plant areas from August 1973 to July 1974.

INTRODUCTION

The periodic investigation of employees' occupational environments initiated in 1969 is described in detail in LD-1121. This report is an addendum and contains tabulated data obtained from August 1973 through July 1974.

DISCUSSION

Testing in several areas has been deleted where previously compiled data does not warrant further investigation.

Several procedural changes have been made. Chlorine in air will no longer be determined by personnel monitoring. The apparatus is in short supply and I believe the area monitoring technique now adopted is much more reliable.

Lead in air is no longer determined by the MSA method. Filter membrane collection and atomic absorption analysis techniques as recommended by NIOSH are now in use.

Due to the large number of chlorocarbon determinations made in Area "B" and in shipping areas, this information is deleted from this report. This data is reported directly to management responsible for the respective areas.

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Threshold Limit Values of Airborne Contaminants
 (Exposure Possible within Lake Charles' Plant)
Federal Register, Volume, 39, No. 125

<u>Contaminant</u>	<u>T.L.V. Concentration</u>
Ammonia	25 ppm
Carbon Monoxide	50 ppm
Cadmium (Dust)	0.2 mg/M ³
Chlorine	1 ppm
Chromium	1 mg/M ³
Coal Tar Pitch Volatiles (Benzene Soluble)	0.2 mg/M ³
Copper (Fume)	0.1 mg/M ³
Copper (Dust)	1 mg/M ³
Hydrogen Sulfide	10 ppm
Lead (Inorganic)	0.15 mg/M ³
Mercury*	0.1 mg/M ³
Sodium Hydroxide	2 mg/M ³

*American Conference of Governmental Industrial Hygienists (ACGIH) Standard for mercury is 0.05 mg/M³.

Mineral Dusts

Nuisance Dust	15 mg/M ³
Respirable Fraction	5 mg/M ³

Asbestos

Standards based on length of exposure and type of protection worn.

<u>Exposure</u>	<u>Fibers > 5 μm/ml</u>	
	<u>No Protection</u>	<u>Approved Respirators</u>
8 Hours	5	25
15 Minutes Ceiling	10	50

TABLE 1
OCCUPATIONAL ENVIRONMENT AIR MONITORING

<u>Area</u>	<u>Monitored Personnel</u>	<u>Date-Time</u>	<u>Contaminant</u>	<u>Concentration</u>	<u>Conditions</u>	<u>Method</u>
Mercury Cell Circuit	Area - Center of Cell Building	7-24-74 A.M.	Chlorine	0.4 ppm	2 Hours	Impinger Sampler and o-Tolidine Colorimetric
	Area - West Center of Cell Building	7-24-74 A.M.	Chlorine	0.5 ppm	2 Hours	Ditto
	Cell Auxiliary Operator	7-26-74 Day Shift	Hydrogen Sulfide	< 0.01 ppm	7 Hours	H ₂ S Badge
	Brine Operator	7-26-74 Day Shift	Ditto	< 0.01 ppm	7 Hours	Ditto

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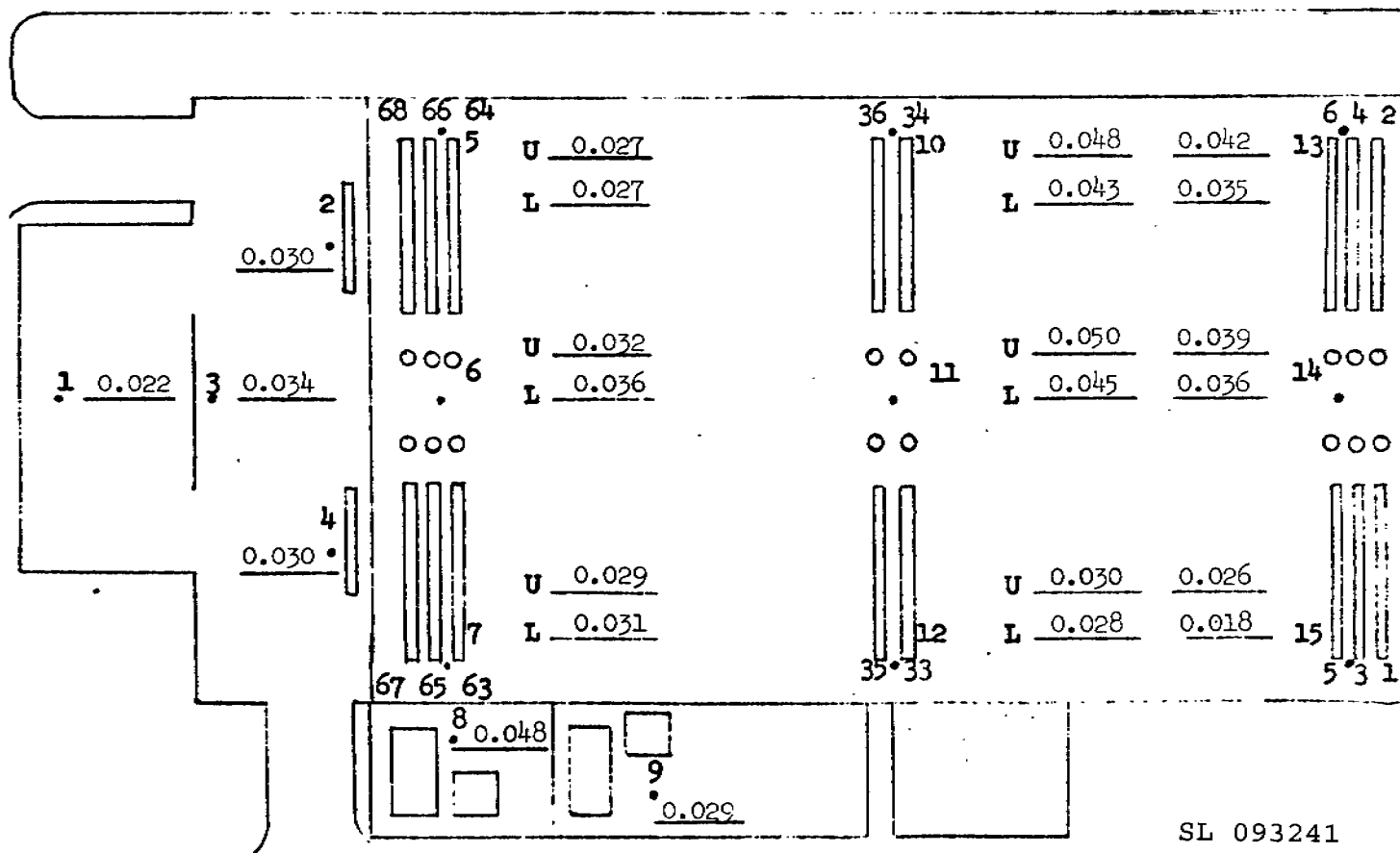
31A-229-3
(Rev. 5/74)

TABLE 2
MERCURY IN AIR AT MERCURY CELL
(Hg in mg/M³)

Date : 7/13/73 to 7/25/74

Laboratory	<u>0.014</u>	Control Room	<u>0.012</u>	H ₂ Stack Area	<u>0.005</u>
Lunch Room	<u>0.044</u>	Office	<u>0.010</u>	Open Cells	<u>--</u>
No. of People	<u> </u>	Motor Control	<u>0.040</u>	Relative Humidity	<u>--</u>
Rest Room	<u>0.025</u>	Area Maintenance	<u>0.012</u>	Temperature	<u>--</u>
Locker Room	<u>0.020</u>	13.8 KV Sw. Gr.	<u>< 0.005</u>	Maintenance	<u>0.005</u>
				Lunch Room	
				Bar. Pressure	<u>--</u>

16 0.005



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U - Cell Floor
L - Ground Floor

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TABLE 3

OCCUPATIONAL ENVIRONMENT AIR MONITORING

<u>Area</u>	<u>Monitored Personnel</u>	<u>Date-Time</u>	<u>Contaminant</u>	<u>Concentration</u>	<u>Conditions</u>	<u>Method</u>
Brine Treatment/ Liquefaction	Area South of Reboilers	8-1/74 AM	Chlorine	< 0.1 ppm	1 Hour	o-Tolidine, Colorimetric
	Liquefaction Operator (Gray)	8-1-74 AM	Ammonia	< 5 ppm	4 Hours	MSA Monitaire Sampler
	Brine Treatment Operator (Pearce)	8-1-74 AM	Ammonia	< 5 ppm	4 Hours	Ditto

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TABLE 4
OCCUPATIONAL ENVIRONMENT AIR MONITORING

<u>Area</u>	<u>Monitored Personnel</u>	<u>Date-Time</u>	<u>Contaminant</u>	<u>Concentration</u>	<u>Conditions</u>	<u>Method</u>
Asustic Plant Ird Area .	-	7-24-74 A.M.	NaOH Mist	0.9 mg/M ³	2 Hours	Water Scrubber/ Atomic Absorp- tion Sodium Anal.
ELS®/Anhydrous - agging Area	-	7-24-74 A.M.	NaOH Mist	0.4 mg/M ³	2 Hours	Ditto
Asustic Bridge	North Side, near Control Room	8-1-74 AM	Chlorine	< 0.1 ppm	1 Hour	o-Tolidine, Colorimetric

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TABLE 5
OCCUPATIONAL ENVIRONMENT AIR MONITORING

<u>Area</u>	<u>Monitored Personnel</u>	<u>Date-Time</u>	<u>Contaminant</u>	<u>Concentration</u>	<u>Conditions</u>	<u>Method</u>
Diaphragm Cell Circuits ,	Tender, Circuits 1,2	7-23-74 AM	Chlorine	1 ppm	4 Hours	MSA Monitaire Sampler
	Tender, Circuits 5,6	7-23-74 AM	Chlorine	1 ppm	4 Hours	Ditto
	Tender, Circuits 7,8	7-23-74 AM	Chlorine	0.5 ppm	4 Hours	Ditto

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TABLE 6
OCCUPATIONAL ENVIRONMENT AIR MONITORING

<u>Area</u>	<u>Monitored Personnel</u>	<u>Date-Time</u>	<u>Contaminant</u>	<u>Concentration</u>	<u>Conditions</u>	<u>Method</u>
Diaphragm Cell Repair and Manufacturing	DeJean	3-6-74 PM	Lead	0.88 mg/M ³	Pouring Anodes (Approximately 4 Hrs.)	NIOSH Filter Membrane
	Guillory	3-6-74 PM	Lead	0.58 mg/M ³	Solder Wiping (Approx. 4 Hours)	Ditto
	Clifton	3-8-74 AM	Lead	0.17 mg/M ³	Pouring Anodes (4 Hours)	Ditto
	Clements	3-8-74 AM	Lead	1.03 mg/M ³	Solder Wiping (4 Hours)	Ditto
	DeJean	3-13-74 AM	Lead	0.34 mg/M ³	Pouring Anodes (3 Hours)	Ditto
	Guillory	3-13-74 AM	Lead	0.31 mg/M ³	Solder Wiping (3 Hours)	Ditto
	McNabb	3-14-74 AM	Lead	0.50 mg/M ³	Adding Pb to Pots (3 Hours)	Ditto
	Hartman	3-15-74 PM	Lead	0.04 mg/M ³	Tinning Cathodes (2.5 Hours)	Ditto
	Clements	6-13-74 AM	Lead	0.07 mg/M ³	Adding Pb to Pots (1.5 Hours)	Ditto
	Clifton	6-13-74 AM	Lead	0.03 mg/M ³	Pouring Anodes (1.5 Hours)	Ditto
	Hartman	6-13-74	Lead	0.17 mg/M ³	Tinning Cathodes (1 Hour)	Ditto

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TABLE 6 - (Cont'd.)

OCCUPATIONAL ENVIRONMENT AIR MONITORING

<u>Area</u>	<u>Monitored Personnel</u>	<u>Date-Time</u>	<u>Contaminant</u>	<u>Concentration</u>	<u>Conditions</u>	<u>Method</u>
Diaphragm Cell Repair and Manufacturing (Area Sampling for Lead)	Center Lunch Table	3-13-74 AM	Lead	0.08 mg/M ³	Approximately 3 Hours	NIOSH Filter Membrane
	East Wall, by Temp. Recorder	3-14-74 AM	Lead	0.03 mg/M ³	Approximately 3 Hours	Ditto
	Between Pb Pots	3-15-74 Day Shift	Lead	0.07 mg/M ³	6.3 Hours	Ditto
	South of Tinning Area	3-19-74 PM	Lead	0.05 mg/M ³	3.5 Hours	Ditto
	North of Pb Pots	3-19-74 PM	Lead	0.05 mg/M ³	3.5 Hours	Ditto
	North of Pb Pots	3-27-74 Day Shift	Lead	0.06 mg/M ³	7 Hours	Ditto
	East of Pb Pots	3-27-74 Day Shift	Lead	0.06 mg/M ³	7 Hours	Ditto
	Between Pb Pots	3-27-74 Day Shift	Lead	0.04 mg/M ³	7 Hours	Ditto
	South of Tinning Area	3-27-74 Day Shift	Lead	0.11 mg/M ³	7 Hours	Ditto
	Between Tinning Area and Pb Pots	3-28-74 AM	Lead	0.06 mg/M ³	5.5 Hours	Ditto
	Between Pb Pots	3-28-74 AM	Lead	0.03 mg/M ³	5.5 Hours	Ditto

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TABLE 6 - (Cont'd.)

OCCUPATIONAL ENVIRONMENT AIR MONITORING

Area	Monitored Personnel	Date-Time	Contaminant	Concentration	Conditions	Method
Diaphragm Cell Repair and Manufacturing	Guillory	3-13-74 AM	Tin	0.28 mg/M ³	Solder Wiping (3 Hours)	NIOSH Filter Membrane
	Hartman	3-15-74 PM	Zinc	0.01 mg/M ³	Tinning Cathodes (2.5 Hours)	Ditto
	Minnifield	11-13-73	Asbestos	0.36 Fibers/ml	Fluffing Asbestos (3 Hours)	Personnel Monitor with Membrane Filter
	Thomas	11-14-73	Asbestos	1.90 Fibers/ml	Cutting Asbestos Rope (15 Minutes)	Ditto
	Minnifield	11-26-73	Asbestos	20.8 Fibers/ml	Fluffing Asbestos (15 Minutes)	Ditto
	Thomas	11-26-73	Asbestos	0.09 Fibers/ml	Packing Asbestos Rope in Cells (8 Minutes)	Ditto
	Boyd	11-29-73	Asbestos	2.0 Fibers/ml	Sieving Asbestos Shipment Samples (22 Minutes)	Ditto
	Minnifield	12-12-73	Asbestos	1.14 Fibers/ml	Fluffing Asbestos (15 Minutes)	Ditto
	Derousseau	12-12-73	Asbestos	4.56 Fibers/ml	Fluffing Asbestos (15 Minutes)	Ditto
	Minnifield	12-17-73	Asbestos	0.41 Fibers/ml	Ditto	Ditto
	Derousseau	3-7-74	Asbestos	9.75 Fibers/ml	Ditto	Ditto
	Minnifield	3-7-74	Asbestos	6.44 Fibers/ml	Ditto	Ditto
	Cady	5-22-74	Asbestos	3.2 Fibers/ml	Observing Box Car Unloading of Asbestos (5 Minutes)	Ditto
	Riley	5-22-74	Asbestos	1.8 Fibers/ml	Laborers unloading	Ditto
	Bellard	5-22-74	Asbestos	1.4 Fibers/ml	Box Car Shipment	
	Kelley	5-22-74	Asbestos	2.0 Fibers/ml	of	
	Reed	5-22-74	Asbestos	0.17 Fibers/ml	Asbestos	
	Hall	5-22-74	Asbestos	1.9 Fibers/ml	(15 Minutes)	
	Carrier	6-13-74	Asbestos	2.3 Fibers/ml	Fluffing Asbestos (14 Minutes)	Ditto

TABLE 6 - (Cont'd.)

OCCUPATIONAL ENVIRONMENT AIR MONITORING

<u>Area</u>	<u>Monitored Personnel</u>	<u>Date-Time</u>	<u>Contaminant</u>	<u>Concentration</u>	<u>Conditions</u>	<u>Method</u>
Area Sampling for Asbestos	Asbestos Rope Packing Area	11-13-73	Asbestos	0.04 Fibers/ml	5 Hours	Personnel Monitor with Membrane Filter
	Diaphragm Depositing Area	12-12-73	Asbestos	0.15 Fibers/ml	4 Hours	Ditto
	Ditto	3-7-74	Asbestos	0.19 Fibers/ml	4 Hours	Ditto
	Popillion	7-29-74 AM	Benzene-Soluble Coal Tar Pitch Volatiles	2.5 mg/M ³	Dipping Tar (3 Hours)	PSM-1013
	Thibodeaux	7-29-74 AM	Ditto	2.0 mg/M ³	Pouring Tar (3 Hour)	Ditto
	Guidry	7-30-74 AM	Carbon Monoxide	< 5 ppm	Working in Cell Repair and Driving Heister (4 Hours)	MSA Monitaire Sampler
	Jones	7-30-74 AM	Carbon Monoxide	< 5 ppm	Driving Heister in Cell Repair and Cell Area (4 Hours)	Ditto

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TABLE 6 - (Cont'd.)

OCCUPATIONAL ENVIRONMENT AIR MONITORING

<u>Area</u>	<u>Monitored Personnel</u>	<u>Date-Time</u>	<u>Contaminant</u>	<u>Concentration</u>	<u>Conditions</u>	<u>Method</u>
Area Sampling for Chlorine	Center of Repair, near Lead Pots	7-30-74	Chlorine	1 ppm	1 Hour	o-Tolidine, Colorimetric
	Center, near Mastic Area	7-30-74	Chlorine	0.2 ppm	1 Hour	Ditto
	Center, near Lead Pots	7-31-74	Chlorine	< 0.1 ppm	1 Hour	Ditto
	Center, near Mastic Area	7-31-74	Chlorine	< 0.1 ppm	1 Hour	Ditto

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TABLE 11
OCCUPATIONAL ENVIRONMENT AIR MONITORING

<u>Area</u>	<u>Monitored Personnel</u>	<u>Date-Time</u>	<u>Contaminant</u>	<u>Concentration</u>	<u>Conditions</u>	<u>Method</u>
Maintenance Personnel	Hayes-Welder	3-15-74 AM	Copper Fume	0.45 mg/M ³	Welding Copper (3 Hours)	Membrane Filter and Atomic Absorptio Anal.
Sandblasting Area (35 Yards Downwind)		9-17-73	Cadmium	< 0.06 mg/M ³		Ditto
			Chromium	< 0.12 mg/M ³		
			Copper	< 0.06 mg/M ³		
			Lead	< 0.06 mg/M ³		
			Zinc	1.52 mg/M ³		
			Total Particulate	66.6 mg/M ³		Midget Cascade Impactor
			Respirable Particulate	22% or 15 mg/M ³		Ditto

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TABLE 10 - (CONT'D.)
OCCUPATIONAL ENVIRONMENT AIR MONITORING

Area	Monitored Personnel	Date-Time	Contaminant	Concentration	Conditions	Method
	VCM Plant Lab	6-21-73	VC	4.5 ppm		Activated Carbon Adsorption/G.C.
			EC	0.74 ppm		
			VDC	0.03 ppm		
			EDC	0.48 ppm		
			MC	0.46 ppm		
			Tri	0.17 ppm		
			TCE	None Detected		
			Per	0.25 ppm		
			Unsym	None Detected		
			Sym	None Detected		
			Penta	None Detected		
	Area "B" Maintenance Shop	6-21-73	VC	0.09 ppm		Activated Carbon Adsorption/G.C.
			EC	0.22 ppm		
			VDC	0.06 ppm		
			EDC	0.15 ppm		
			MC	0.95 ppm		
			Tri	0.14 ppm		
			TCE	0.50 ppm		
			Per	0.44 ppm		
			Unsym	0.18 ppm		
			Sym	0.54 ppm		
			Penta	0.03 ppm		
	S.E. Corner of OHC Plant	6-27-73	VC	0.03 ppm		Activated Carbon Adsorption/G.C.
			EC	0.09 ppm		
			VDC	0.04 ppm		
			EDC	0.37 ppm		
			MC	0.06 ppm		
			Tri	0.08 ppm		
			TCE	0.14 ppm		
			Per	0.14 ppm		

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