

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

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LD-1121E

CONTINUING PROGRAM OF MONITORING ATMOSPHERIC CONTAMINANTS
WITHIN THE LAKE CHARLES PLANT

by

Mark Wood

December 29, 1972

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Key Words

Occupational Environment
Atmospheric Contaminants
Monitaire Sampler
MSA Universal Pump
Andersen Mini Sampler
Electrostatic Precipitation
Unico Gas Detector
Mercury Vapor Detector
OSHA
Silver Wool Mercury Monitor
Hydrogen Sulfide Detector

SL 093284

LABORATORY DEPARTMENT
MARK WOOD

TECHNICAL REPORT
DECEMBER 29, 1972

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

ABSTRACT

The tables composing this report are continuations of occupational environment surveys started early in 1969 and contain data from all plant areas from May 1972 to December 1972.

INTRODUCTION

The periodic investigation of employee's occupational environments initiated in 1969 is described in detail in LD-1121. This report is an addendum and contains tabulated data collected from May 1972 through December 1972.

DISCUSSION

In addition to routine area monitoring for mercury vapor, a new method has been developed and used. Eight-hour personnel monitoring using silver wool as a mercury adsorber has been used on several employees in the Mercury Circuit Area and results are reported in Table 1. A description of the silver wool method is reported in LD-1324.

Another additional survey reported in Table 1 is hydrogen sulfide monitoring of individuals working around the sulfide sump and the mercury settling pond. A very sensitive badge detector manufactured by Metronics Associates was employed.

Heat stress analyses are not reported since OSHA has adopted these measurements only to determine areas that would fall under the classification of potential heat stress working environments. Sufficient data have been collected in the Diaphragm Cells and Mercury Circuit Areas to warrant a program of heat stress prevention measures as outlined by OSHA for potential high heat exposure work places.

Results of occupational environment surveys, tabulated by areas, are appended. Table 7 on the Sodium Chlorate Plant has been deleted.

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A P P E N D I X

Threshold Limit Values
of
Airborne Contaminants and Physical Agents
 (Existing within the Lake Charles Plant)

<u>Contaminant</u>	<u>T.L.V. Concentration</u>
Ammonia	50 ppm (intended change 25 ppm)
Chlorine	1 ppm
Hydrogen Chloride	5 ppm
Hydrogen Sulfide	10 ppm
Lead	0.20 mg/M ³ (intended change - 0.15 mg/M ³)
Mercury	0.05 mg/M ³
Methyl Chloroform	350 ppm
Perchloroethylene	100 ppm
Phosgene	0.1 ppm
Sodium Hydroxide	2 mg/M ³
Trichloroethylene	100 ppm
Vinyl Chloride	500 ppm (intended change - 200 ppm)
<u>Mineral Dusts</u>	
Nuisance Dust	10 mg/M ³
Asbestos	5 fibers > 5 µ/ml
Silica Pigments	6 mg/M ³ (adopted by PPG Industries, Inc.)

From: 1971 Edition, Threshold Limit Values of Airborne Contaminants
Adopted by ACGIH (American Conference of Governmental Industrial
 Hygienists)

Federal Register, Volume 36, Number 105, p 10503-10506.

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	Cell Operator	11-7-72 (A.M.)	Chlorine	0.5 ppm	-	Monitaire Sampler
	Cell Auxiliary Operator	Ditto	Ditto	0.5 ppm	-	Ditto
	Cell Repairman	Ditto	Ditto	0.5 ppm	-	Ditto
	Cell Cut-Out Man	Ditto	Ditto	0.75 ppm	-	Ditto
	Cell Operator	11-7-72 (A.M.)	Mercury	0.05 mg/M ³	-	Monitaire Sampler
	Cell Auxiliary Operator	7-31/8-4-72 Average of 5 eight hour exposures	Ditto	0.070 mg/M ³		Silver Wool Personnel Monitor
		11-7-72 (A.M.)	Ditto	< 0.05 mg/M ³	-	Monitaire Sampler
	Cell Repairman	7-24/7-28-72 Average of 5 eight hour exposures	Ditto	0.053 mg/M ³	-	Silver Wool Personnel Monitor
		11-7-72 (A.M.)	Ditto	< 0.05 mg/M ³	-	Monitaire Sampler

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TABLE 1 (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>
Mercury Cell Circuit	Cell Cut-Out Man (I)	7-24/7-28-72 Average of 5 eight hour exposures	Mercury	0.069 mg/M ³	-	Silver Wool Personnel Monitor
	Cell Cut-Out Man (II)	Ditto	Ditto	0.061 mg/M ³	-	Ditto
		11-7-72 (A.M.)	Ditto	0.05 mg/M ³	-	Monitaire Sampler
	Cell Auxiliary Operator	11-7-72 (A.M.)	Hydrogen Sulfide	< 0.01 ppm	-	H ₂ S Badge
	Brine Area Operator	Ditto	Ditto	< 0.01 ppm	-	Ditto

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31A-220-3
(Rev. 10/69)

TABLE 2
MERCURY IN AIR AT MERCURY CELL
(μg in m^3/M^3)

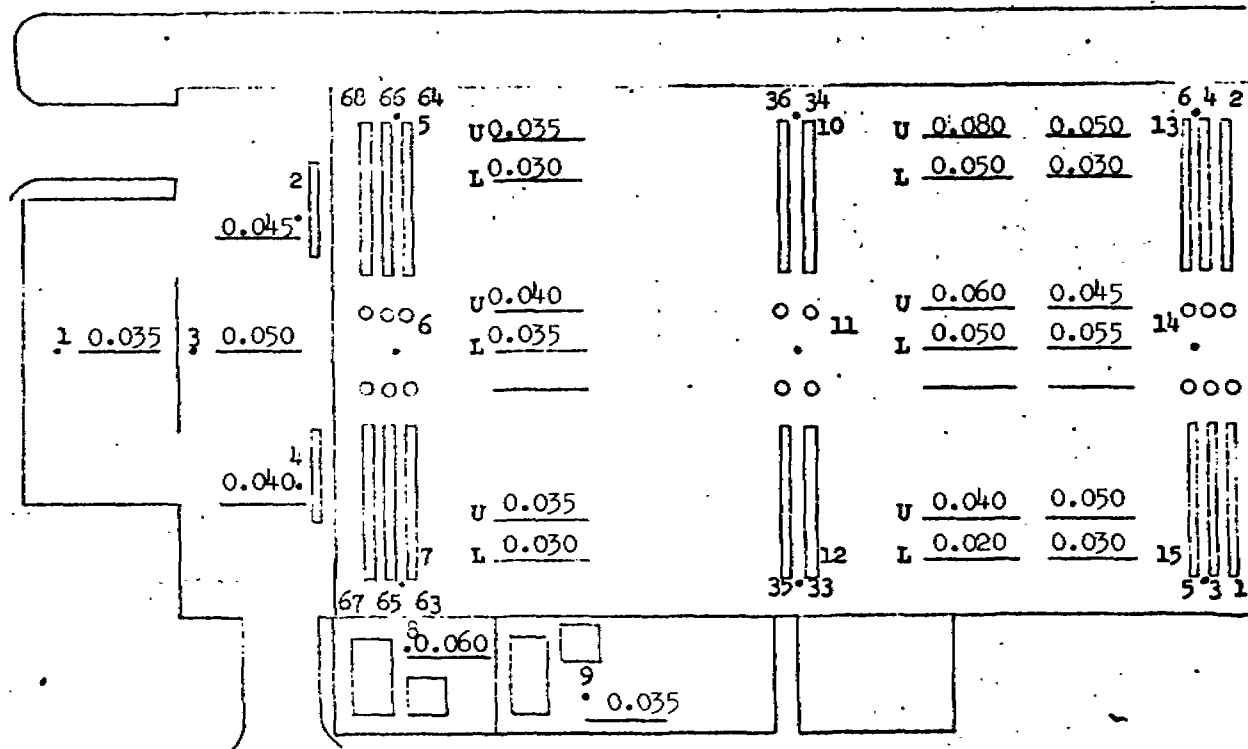
Date: 5/3-11/20/72
(Average of 30 Surveys)

Laboratory 0.010
Lunch Room 0.035
No. of People 6
Rest Room 0.015
Locker Room 0.010

Control Room 0.015
Office 0.010
Motor Control 0.020
Area Maintenance 0.010
13.8 KV Sw. Gr. 0.005

H₂ Stack Area 0.010
Open Cells _____
Relative Humidity _____
Temperature _____
Maintenance 0.005
Lunch Room _____

16 0.005



Approved: _____

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U - Cell Floor
L - Ground Floor

Surveys taken with J-W Lemaire Mercury Sniffer, Model MV-2.

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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	Liquefaction Operator	11-8-72 (A.M.)	Chlorine	0.75 ppm	-	Monitaire Sampler
	Brine Treatment Operator	Ditto	Ditto	0.5 ppm	-	Ditto
	Liquefaction Operator	11-8-72 (A.M.)	Ammonia	8 ppm	-	Monitaire Sampler
	Brine Treatment Operator	Ditto	Ditto	< 5 ppm	-	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>
Caustic Plant	Evaporator Operator	11-8-72	Chlorine	0.5 ppm	-	Monitaire Sampler
	Area Janitor	Ditto	Ditto	0.5 ppm	-	Ditto
	Evaporator Operator	11-8-72 (A.M.)	Ammonia	< 5 ppm	-	Monitaire Sampler
	Area Janitor	Ditto	Ditto	< 5 ppm	-	Ditto
Caustic Bird Area	-	11-8-72 (A.M.)	NaOH Mist	0.2 mg/M ³	-	Water Scrubber/ Atomic Absorption Sodium Anal.
PEIS®/Anhydrous	Operator	11-11-72 (A.M.)	Chlorine	0.5 ppm	-	Monitaire Sampler

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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	11-9-72 (A.M.)	Chlorine	< 0.5 ppm	-	Monitaire Sampler
	Tender, Circuits 5,6	Ditto	Ditto	< 0.5 ppm	-	Ditto
	Tender, Circuits 7,8	Ditto	Ditto	< 0.5 ppm	-	Ditto
	Operator	Ditto	Ditto	< 0.5 ppm	-	Ditto

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TABLE 6
OCCUPATIONAL ENVIRONMENT AIR MONITORING

Area	Monitored Personnel	Date-Time	Contaminant	Concentration	Conditions	Method
Diaphragm Cell Repair and Manufacturing	Lead Pot Area	11-10-72 (P.M.)	Lead	< 0.05 mg/M ³	Pouring Lead	MSA Universal Pump with Lead Kit
	Solder Wiping Area	Ditto	Ditto	0.05 mg/M ³	Wiping tinned bus bars.	Ditto
	Repairman	11-15-72 (P.M.)	Chlorine	< 0.5 ppm	-	Monitaire Sampler
	Diaphragm Depositor	10-19-72 (A.M.)	Asbestos	0.68 Fibers > 5 microns/ml	-	Personnel Monitaire with Filter
		10-24-72 (A.M.)	Ditto	1.15 Fibers > 5 microns/ml	-	Ditto
Acid Dipping Tank Area		11-29-72 (P.M.)	Hydrogen Chloride	25 ppm ¹	While dipping cathodes.	MSA Universal Pump.
		11-29-72 (P.M.)	Ditto	10 ppm ¹	While washing cathodes.	Ditto
		11-29-72 (P.M.)	Ditto	2 ppm ¹	While drying cathodes.	Ditto

1. Respirator necessary.

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TABLE 8
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>
Power Houses	"A" Watch Engineer	11-11-72 (A.M.)	Chlorine	< 0.5 ppm	-	Monitaire Sampler
	"B" Watch Engineer	Ditto	Chlorine	< 0.5 ppm	-	Ditto

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TABLE 9
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>
Silica Pigments (see note for locations of sampling)	C	9-13-72 (A.M.)	Particulates	1.3 mg/M ³	Loading	Electrostatic Precipitation
	D	Ditto	Ditto	4.9 mg/M ³	Loading	Ditto
	E	Ditto	Ditto	9.4 mg/M ³	Bagging and Loading	Ditto
	F	Ditto	Ditto	22.6	Ditto	Ditto
	Sampling personnel wearing Midget Cascade Impactor while sampling above points - 1-1/2 hours	9-13-72 (A.M.)	Total Particulates	9.9 mg/M ³		Andersen Mini-Sampler
			Respirable Portion	2.2 mg/M ³ or 22% Respirable (wind E at 7 mph)		
Furnace Building Upper Floor		11-7-72 (A.M.)	NaOH Mist	0.2 mg/M ³		Water Scrubber/ "AA" Sodium Analysis

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TABLE 10
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>
Organics Area (see map for sample locations)	1 thru 9	9-11-72	Phosgene	None Detected	14 mph ESE wind	Unico Gas Detection Tubes
	1 thru 9	9-11-72	Methyl Chloroform	None Detected	14 mph ESE wind	Unico Gas Detection Tubes
	5	9-11-72	Per/Tri	10 ppm	14 mph ESE wind	Unico Gas Detection Tubes
	8	9-11-72	Per/Tri	10 ppm	Ditto	Ditto
	All other points	9-11-72	Per/Tri	None Detected	Ditto	Ditto
	3	9-11-72	Vinyl Chloride	None Detected	14 mph ESE wind	Unico Gas Detection Tubes
	4	9-11-72	Ditto	None Detected	Ditto	Ditto
	1 thru 9	9-11-72	Carbon Tetrachloride	None Detected	14 mph ESE wind	Unico Gas Detection Tubes
	3	9-11-72	Hydrogen Chloride	None Detected	14 mph ESE wind	Unico Gas Detection Tubes
	4	9-11-72	Ditto	None Detected	Ditto	Ditto
	8	9-11-72	Ditto	None Detected	Ditto	Ditto
	9	9-11-72	Ditto	None Detected	Ditto	Ditto

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SILICA PIGMENTS AREA
PARTICULATE AIR SAMPLING LOCATIONS

- A Downstairs in Frit Reactor area of Furnace Building
- B Upstairs, over the south end of the furnace in Furnace Building
- C Northeast corner of the Pigments Shipping Building where trucks and boxcars are loaded
- D Center of Pigments Shipping Building, under North-South conveyors
- E On the Bagging Platform between Baggers in Pigments Shipping Building
- F Center of Lower Roadway leading out the west door of Pigments Shipping Building, adjacent to Bagging Area and Hopper Car Loading

Organics Area

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Sampling

Points

