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August 14, 1974

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Mr. Julius Jimeno
Occupational Safety and Health
Administration
Department of Labor
1726 M Street, N. W.
Room 200
Washington, D. C. 20210

Dear Mr. Jimeno:

Enclosed are the following submissions of General Cable Corporation for the record of the hearings on vinyl chloride:

1. Copies of studies surveying the levels of vinyl chloride at four General Cable plants that use polyvinyl chloride. Except for one reading, all breathing zone samples disclose vinyl chloride concentrations less than 1.0 ppm. The single exception was reported from a sample taken at the Bonham Plant. "Grab samples" taken at points of suspected concentrations ran as high as 3.4 ppm. None of the "grab samples" are from areas in which employees regularly work.
2. Letters from the B.F. Goodrich Chemical Company and Tenneco Chemicals indicating that the availability of PVC to General Cable could be severely affected by the proposed standard of "no detectable level."

This submission satisfies the requests for the record made by General Cable Corporation in its testimony at the hearings.

Very truly yours,

Lowell D. Turnbull
Lowell D. Turnbull

Enclosure

BFG26299

23559001

George D. Clayton & Associates

25711 Southfield Road, Southfield, Michigan 48075 • Telephone: 313 424-8260

for better environment

MUN 13151

June 10, 1974

Mr. Henry F. Urban
Director of Safety
General Cable Corporation
300 Rahway Avenue
Union, New Jersey 07083

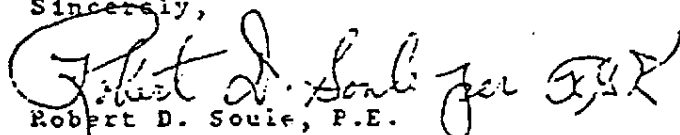
Dear Mr. Urban:

Presented herewith is a report, submitted in triplicate, summarizing the results of the industrial hygiene survey conducted at the Memphis, Tennessee facility on May 16, 1974 by Mr. Michael S. Mosher of our staff.

In summary, on the basis of analysis of a total of sixteen general area and personal breathing zone samples collected in representative areas of the extrusion plant, there was no evidence of a potential health hazard associated with exposure of employees to vinyl chloride. Concentrations of vinyl chloride were less than the limits of detection of the sampling and analytical methodology (0.04 ppm or less) in all areas evaluated.

It has been a pleasure to be of assistance to you on this project. Please contact us if you have questions concerning any aspects of this report.

Sincerely,



Robert D. Soule, P.E.
Vice-President, Industrial Hygiene Services

RDS/pe

Enclosures

Memphis Office: P.O. Box 425 • Southfield Office: 25711 Southfield Road • Telephone: (313) 424-8260

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INDUSTRIAL HYGIENE SURVEY
GENERAL CABLE CORPORATION
MEMPHIS, TENNESSEE

INTRODUCTION

M & M Protection Consultants retained George D. Clayton & Associates to conduct an industrial hygiene survey of the General Cable Corporation extrusion plant located in Memphis, Tennessee. Purposes of this study were to determine concentrations of vinyl chloride to which workers were being exposed and to interpret the results in terms of potential health hazards, with particular reference to regulations promulgated under the Occupational Safety and Health Act of 1970 and other accepted standards of good practice within the field of occupational health. Results of the survey, conducted on May 16, 1974 by Mr. Michael S. Mosher of Clayton & Associates, are reported herein.

DESCRIPTION OF OPERATIONS

The General Cable Corporation employs approximately 100 people at their Memphis, Tennessee Plant in the manufacture of extruded wire products incorporating polyvinyl chloride (PVC). Raw PVC is mixed with dibasic lead phthalate in a dry blend room, which is a regular work station for only one man. An exhaust hood is used at the weigh area but there is no local exhaust ventilation where the lead is dumped into the hot (250°F) mixer with the PVC. The mixture is then transferred from the hot to the cold (room temperature) mixer, from which the mixture is transferred to bins by means of a conveyor. The mixed PVC is allowed to free-fall from the end of the conveyor into open bins.

The extruders, which are fed from the bins containing polyvinyl chloride by a pumping mechanism, operate at approximately 425°F. Metal wire is pulled through the hot extruders and then through a water quenching operation in a trough located within a foot of the extruder head. From the end of the trough the coated wire is wound and packaged. The regular domestic sources of PVC were in use during the survey.

DISCUSSION OF POTENTIAL HEALTH HAZARD ASSOCIATED
WITH EXPOSURE TO VINYL CHLORIDE

Vinyl chloride is a gas at standard conditions. Until very recently the material was considered to be much more of a fire and explosion hazard than a health hazard. Although vinyl chloride was known to be anesthetic at relatively high concentrations (16,000 ppm) there was no evidence of a significant hazard associated with exposures of workers to concentrations normally encountered in industrial situations of manufacture and use.

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However, in January, 1974, the B. F. Goodrich Company reported that four of their employees at the Company's plant in Louisville, Kentucky, had died of liver angiosarcoma, a cancer apparently related to their past exposure to vinyl chloride. As a result of this report and subsequent investigations by the National Institute for Occupational Safety and Health and the Occupational Safety and Health Administration, the acceptable limit for concentrations of vinyl chloride in air to which workers could be exposed was reduced by an emergency temporary health standard established by the U.S. Department of Labor on April 5, 1974, from a ceiling of 500 ppm to a ceiling of 50 ppm.

Continuing studies with animals, and comprehensive epidemiological studies of vinyl chloride and polyvinyl chloride workers, indicate that exposure to concentrations as low as 50 ppm are capable of producing adverse effects. Accordingly, the U.S. Department of Labor has proposed a permanent health standard limiting worker exposures to "no detectable level" using methods capable of measuring one part per million with an accuracy of plus-or-minus 50 percent.

SAMPLING AND ANALYTICAL METHODS

Air sampling conducted during this study was of two basic types: general area and personal breathing zone. For both types, samples were collected by drawing air through small glass tubes, packed with activated carbon, at a measured flowrate by means of small battery-operated pumps (Mine Safety Appliances Company, Model G).

The general area samples were collected at stationary sites strategically located through the work areas. The personal breathing zone sampling units were worn by the workers; the pump was attached to the belt and the sampler head (activated carbon tube) was attached on the outside of the worker's shirt in the approximate breathing zone. Thus, these latter samples were representative of the conditions to which the worker was exposed during the sampling period.

After collection of the sample, the glass tubes were sealed with small plastic caps for transfer to the Clayton & Associates laboratory. All samples were analyzed subsequently using gas chromatographic techniques. These analytical results, in conjunction with the sampling data (air flowrate and duration of the sampling to yield the total volume of air sampled) were used to calculate the corresponding concentrations of vinyl chloride in terms of parts of vinyl chloride per million parts of air, by volume.

PRESENTATION OF RESULTS

The results of the vinyl chloride sampling in the personal breathing zones and general areas of the operation are presented in Tables I and II, respectively. Examination of these data shows that no detectable amount of vinyl chloride was observed in any of the samples collected. The limit of detection for the combined sampling and analytical methods was 0.04 ppm, or less.

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CONCLUSION

On the basis of observations and measurements made during this survey, it is concluded that the concentrations of vinyl chloride to which workers are exposed during the course of routine operation of the plant are within acceptable limits. In all areas, concentrations were less than 0.04 ppm, considerably less than the currently acceptable ceiling concentration (50 ppm) established by the U.S. Department of Labor's emergency temporary standard and the proposed permanent standard of one ppm.

This report prepared by:

Michael S. Mosher for GDS
Michael S. Mosher,
Industrial Hygienist

BFG26303

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TABLE I
 GEORGE D. CLAYTON & ASSOCIATES
 General Cable Corp. INDUSTRIAL HYGIENE SAMPLING SUMMARY
 Plant Memphis, Tennessee Material Vinyl Chloride

1974 Date	Sample No.	Description	Sampling Period		Sample Weight	Sample Volume liters	Concentration		
			Start	Stop			Vinyl Chloride ppm		
		EXTRUSION LINE OPERATORS' PERSONAL BREATHING ZONES							
5/16	VC-1	Line Number 13, Russell Freeman	9:11	12:33		162	<0.02		
5/16	VC-2	Line Number 12, Leo Stevenson	9:14	12:34		170	<0.02		
5/16	VC-4	Line Number 11, Ken Sultzbach	9:28	13:12		190	<0.02		
5/16	VC-6	Line Number 8, Packager, Jerry Grey	9:43	13:23		143	<0.02		
5/16	VC-8	Line Number 12, Elroy Young	11:16	13:27		105	<0.02		
5/16	VC-9	Line Number 8, Jerry Simmons	13:07	15:32		123	<0.02		
5/16	VC-13	Line Number 10, Charles Dugger	14:05	15:27		57.4	<0.04		
5/16	VC-14	B-Line, Charley Oliver	14:08	15:30		65.6	<0.04		
		Acceptable ceiling concentration (OSHA)					50		
		Emergency Temporary Standard promulgated on April 5, 1974							

TABLE II
GEORGE D. CLAYTON & ASSOCIATES
INDUSTRIAL HYGIENE SAMPLING SUMMARY

General Cable Corp.
Plant Memphis, Tennessee

Material Vinyl Chloride

1974 Date	Sample No.	Description	Sampling Period		Sample Weight	Sample Volume liters	Concentration		
			Start	Stop			Vinyl Chloride ppm		
		STATIONARY AREA SAMPLES							
5-16	VC-3	Work Station Between Lines 12 and 13	9:16	12:36		140	<0.02		
5-16	VC-5	PVC Feed Bin to Line Number 11 Approximately 1.0 Feet From Opening	9:33	13:13		198	<0.02		
5-16	VC-7	Over Control Panel on Line Number 12, Approximately 3 Feet Above Extruder	9:55	13:26		222	<0.02		
5-16	VC-10	Approximately 2 Feet Above Line Number 8 Extruder	13:10	15:41		90.6	<0.03		
5-16	VC-11	Southwest Corner of Scrap Room, Near Power Switches	13:21	15:47		117	<0.02		
5-16	VC-12	Above Control Box in Dry Blend, Near Center of Room	14:00	15:50		105	<0.02		
5-16	VC-15	Approximately 1.5 Feet From Extruder on Line Number 9	14:17	15:57		105	<0.02		
5-16	VC-16	Approximately 4 Feet From Number 12 Line Extruder, Above Control Panel	14:30	15:59		79.7	<0.03		
		Acceptable Ceiling Concentration (OSHA)					50		
		Emergency Temporary Standard Promulgated on April 5, 1974							

BFG26305



3545 Wilshire Boulevard
Los Angeles, CA 90010

213/382-6111

July 12, 1974

JUL 18 1974

Mr. H. F. Urban
Director of Safety
General Cable Corporation
800 Rahway Avenue
Union, New Jersey 07083

Dear Mr. Urban:

The attached report is a result of the study I conducted at the Lindsey, California and Sanger, California plants on June 12 and 13, 1974 to evaluate the significance of airborne exposures to vinyl chloride at these plants. The results essentially confirm our earlier prediction.

I hope this report will be useful to you. Please do not hesitate to contact me if you should have any questions.

Sincerely,

AMERICAN MOTORISTS INSURANCE COMPANY

Richard E. Dolliver
Industrial Hygienist

cc/ W. Stuart -- Lindsey
V. Summers -- Lindsey
R. Patton -- Sanger

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FOR
GENERAL CABLE CORPORATION
LINDSEY, CALIFORNIA
SANGER, CALIFORNIA

THIS REPORT IS A RESULT OF THE JUNE 12 - 13, 1974 STUDY TO DETERMINE THE PRESENCE/ABSENCE OF SIGNIFICANT VINYL CHLORIDE EXPOSURE LEVELS DURING PVC (POLY VINYL CHLORIDE) WIRE COVERING/ EXTRUSION OPERATIONS. THE STUDY WAS CONDUCTED ON SUCCESSIVE DAYS AT THE LINDSEY, CALIFORNIA AND SANGER, CALIFORNIA PLANTS.

STUDY RESULTS:

SUMMARY: AIR SAMPLES COLLECTED DURING THE OPENING OF FRESH BOXES OF PVC PELLETS (GEON) AT THE LINDSEY PLANT AND AT THE BOTTOM OF A PVC STORAGE SILO AT THE SANGER PLANT DETECTED VINYL CHLORIDE CONCENTRATION IN EXCESS OF 1 ppm (PARTS PER MILLION) AT THESE SOURCES. ALL SAMPLES COLLECTED IN ROUTINE PRODUCTION AREAS FOUND VINYL CHLORIDE CONCENTRATIONS LESS THAN 1 ppm.

A TOTAL OF 26 AIR SAMPLES WERE COLLECTED FOR THIS STUDY: OF THESE, 22 WERE COLLECTED OVER A CONTINUOUS (47-62 MINUTE) SAMPLE PERIOD (TIME AVERAGED) AND FOUR (4) WERE "GRAB" (SHORT PERIOD) SAMPLES.

FROM A LIMITED COMPARISON OFFERED BY TWO SETS OF SAMPLES, "GRAB" SAMPLE RESULTS APPEAR TO BE ABOUT FOUR (4) TIMES GREATER THAN THE RESULTS OBTAINED FROM "CONTINUOUS" SAMPLING. NO CONCLUSIONS CAN BE MADE CONCERNING THE DIFFERING RESULTS AT THIS TIME. (PLEASE REFER TO THE DISCUSSION)

NONE OF THE 22 CONTINUOUS SAMPLES DETECTED CONCENTRATIONS OF VINYL CHLORIDE GREATER THAN 0.27 ppm. THESE SAMPLES REPRESENTED POTENTIAL PEAK CONCENTRATION AREAS SUCH AS THE THROATS OF PELLET FEED HOPPERS AND NEXT TO THE EXTRUDER HEADS, AS WELL AS THE ACTUAL BREATHING ZONE OF OPERATING PERSONNEL.

THREE OF THE FOUR "GRAB" SAMPLES FOUND VINYL CHLORIDE CONCENTRATIONS GREATER THAN 1 ppm: SAMPLES COLLECTED JUST ABOVE THE SURFACE OF FRESHLY OPENED BOXES OF PVC PELLETS (GEON 80534) AT THE LINDSEY PLANT WERE 2.0 AND 3.4 ppm RESPECTIVELY. THE THIRD "HIGH" SAMPLE (1.1 ppm) WAS COLLECTED AT THE BOTTOM OF A PVC POWDER STORAGE SILO AT THE SANGER PLANT. (THIS LATTER SAMPLE COMPARED TO A CONCENTRATION OF 0.27 ppm OBTAINED FROM "CONTINUOUS" SAMPLING.) THE FOURTH "GRAB" SAMPLE, COLLECTED AT THE WIRE LINE EXIT FROM THE HEAD OF AN EXTRUDER, DETECTED 0.54 ppm VINYL CHLORIDE AS COMPARED TO 0.13 ppm FROM A CONTINUOUS SAMPLE.

DETAILED RESULTS OF THE AIR SAMPLING CAN BE FOUND IN THE TABLE AT THE END OF THIS REPORT: RESULTS FROM THE LINDSEY PLANT ARE IN TABLE I, RESULTS FROM THE SANGER PLANT ARE IN TABLE II.

(CONT'D. ON PAGE 2)

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RECOMMENDATIONS:

ALTHOUGH NO SPECIFIC RECOMMENDATIONS ARE BEING SUBMITTED AT THIS TIME, ATTENTION SHOULD BE GIVEN TO THE TWO AREAS (THE OPENING OF FRESH BOMS OF RAW PVC PELLETS AND AT THE BOTTOM OF PVC STORAGE SILOS) WHERE RELATIVELY HIGH LEVELS OF VINYL CHLORIDE WERE DETECTED.

EQUIPMENT & STUDY PROCEDURES:

TIME AVERAGED (CONTINUOUS) SAMPLES FOR VINYL CHLORIDE WERE COLLECTED USING SAMPLE TUBES FILLED WITH ACTIVATED CARBON/CHARCOAL. A MSA MODEL G PUMP, WITH A MODIFIED FLOW RATE OF 0.1 lpm (LITER PER MINUTE) OR LESS WAS USED AS A VACUUM SOURCE. FLOW RATE WAS VERIFIED BEFORE AND AFTER EACH SAMPLE USING THE INVERTED BURETTE (100 ml) - SOAP BUBBLE TECHNIQUE.

GRAB SAMPLES WERE COLLECTED IN 250 ml SAMPLE TUBES PROVIDED AT EACH END WITH TEFLON STOPCOCKS. AIR WAS DRAWN INTO THE SAMPLE TUBE USING THE MSA MODEL G PUMP UNTIL A REPRESENTATIVE SAMPLE WAS OBTAINED.

THE LOCATIONS OF AIR SAMPLES WERE FREQUENTLY SELECTED IN ATTEMPTS TO FIND THE PRESENCE OF HIGH CONCENTRATIONS OF VINYL CHLORIDE, RATHER THAN TO SIMPLY DETERMINE ACTUAL WORKER EXPOSURES.

ALL SAMPLES WERE ANALYZED IN THE LABORATORY USING HYDROGEN FLAME DETECTION GAS CHROMATOGRAPHY TECHNIQUES. THIS TECHNIQUE IS QUITE SENSITIVE TO VINYL CHLORIDE, BUT "EXACT" DETERMINATIONS ARE NOT POSSIBLE AT THE SMALL LEVELS OF VINYL CHLORIDE AS RECORDED IN THIS STUDY AND THUS THE NUMERICAL RESULTS ARE SUBJECT TO STATISTICAL VARIATIONS.

DISCUSSION:

WHEN EVALUATING THE RESULTS OF THIS STUDY, IT SHOULD BE REMEMBERED THAT THE TYPES OF RAW PVC USED BY THE EXTRUDERS MAY EFFECT THE DETECTABLE AMOUNT OF AIRBORNE VINYL CHLORIDE.

IN REVIEWING THE ATTACHED TABLES, A TENDENCY FOR HIGHER DETECTABLE VINYL CHLORIDE LEVELS IN THE SANGER PLANT THAN IN THE LINDSEY PLANT ARE OBSERVED. AT THESE SMALL CONCENTRATIONS, AND WITH THE POTENTIAL FOR RELATIVELY HIGH STATISTICAL DEVIATION OF ANALYTICAL RESULTS, THE SIGNIFICANCE OF THE DIFFERENCES IN THE TWO PLANTS APPEARS TO BE QUESTIONABLE: ALTHOUGH A DIFFERENCE IN THE TYPE OF PVC USED IN THE TWO PLANTS IS A POSSIBLE EXPLANATION FOR THE SLIGHT INCREASE, THE PVC PELLETS USED IN THE SANGER PLANT ARE PART OF A BLEND PREPARED IN THE PLANT AND WOULD SEEMINGLY CONTAIN LESS TRAP VINYL CHLORIDE GAS THAN "RAW" PELLETS.

SAMPLE RESULT DIFFERENCES ARE NORMALLY EXPECTED BETWEEN GRAB AND TIME AVERAGED (CONTINUOUS) SAMPLES BECAUSE OF THE NATURE OF THE TWO TYPES OF SAMPLING: THE GRAB SAMPLE CAN BE COLLECTED AT THE PRECISE TIME A PEAK (HIGH) FOR "VALLEY" (LOW) CONCENTRATION EXIST WHEREAS THE CONTINUOUS - TYPE SAMPLE WOULD AVERAGE THE HIGHS AND THE LOWS. USUALLY, HOWEVER, THE RANGE IS NOT AS EXTREME FOR SAMPLES COLLECTED TO EVALUATE WHAT THEORETICALLY WOULD BE A RELATIVELY CONSTANT SOURCE (THE BOTTOM OF THE SILO AND THE EXTRUDER
(CONT'D. PAGE 3)

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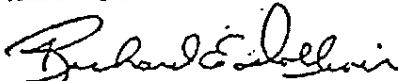
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HEAD). THE DIFFERENCES IN THE TWO TYPES OF SAMPLES ARE NOW UNDER STUDY.

AIR SAMPLING WAS BELIEVED TO BE REPRESENTATIVE OF THE LINDSEY PLANT OPERATIONS. AT THE SANGER PLANT, HOWEVER, NO SAMPLES WERE COLLECTED AT THE "STIRLING" AND THREE - INCH EXTRUDER AS BOTH WERE NOT OPERATING AT THE TIME OF THE STUDY. IN ADDITION, NO SAMPLES WERE COLLECTED WITHIN THE BLENDING ROOM AT THE SANGER PLANT AS THE "RAW" PVC IS ADDED UNDER NEGATIVE SYSTEM PRESSURE (WITHIN THE MIXER) AND AIRBORNE DUST ON THE MIXING PLATFORM WOULD PROBABLY EFFECT THE MODIFIED LOW SAMPLE FLOW RATE.

RESPECTFULLY SUBMITTED,

AMERICAN MOTORISTS INSURANCE COMPANY .



RICHARD E. DOILIVER
INDUSTRIAL HYGIENIST

The investigations which form the basis of this report were made in accordance with generally accepted industrial hygiene practice and were limited to those conditions employing such testing procedures and measuring devices, if any, noted herein. The report does not purport to refer to or guarantee compliance with local, state or federal regulations which may be applicable to other conditions.

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TABLE I
RESULTS OF AIR SAMPLING FOR VINYL CHLORIDE

<u>SAMPLE NO.</u>	<u>LOCATION (TIME) OF SAMPLE</u>	<u>RESULTS (PPM)</u>
<u>2 1/2 - INCH EXTRUDERS</u>		
C-122	AT WIRE LINE EXIT FROM HEAD OF EXTRUDER # 301, USING COMPOUND # 80644, GEON (BFG). (12:47-13:42).	0.17
C-123	SAME AS ABOVE, (14:35-15:27).	0.09
C-124	SAME AS ABOVE, (14:27-18:17).	0.05
C-125	AT HOPPER THROAT OF EXTRUDER # 301. (12:40-13:40).	0.04
C-126	SAME AS # C-125, (14:38-15:28)	0.12
C-127	AT COLOR METER THROAT OF EXTRUDER # 304, USING COMPOUND # 80644, GEON (BFG). (14:05-15:01).	0.04
C-128	GENERAL AREA - APPROXIMATE BREATHING ZONE HEIGHT IN PAY-OFF OF EXTRUDER # 302. (15:36-16:23).	0.07
C-129	BREATHING ZONE OF OPERATOR (B.S.) OF EXTRUDER # 301. (15:17-15:52).	0.07
C-130	BREATHING ZONE OF OPERATOR (K.T.) OF EXTRUDER # 303. (16:14-17:14).	0.04
<u>SWISS AREA</u>		
C-131	AT WIRE LINE EXIT FROM HEAD OF SWISS # 327. (15:51-16:49).	0.05
C-132	AT WIRE LINE EXIT FROM HEAD OF SWISS # 326. (14:20-18:10).	0.11
C-133	GENERAL AREA - APPROXIMATE BREATHING ZONE HEIGHT NEAR HOPPER OF SWISS # 326/327. (15:51-16:49).	0.08
C-134	BREATHING ZONE OF SWISS LINE OPERATOR (A.L.R.). (16:20-17:22)	0.11
C-135	BREATHING ZONE OF SECOND SWISS LINE OPERATOR (A.N.). (16:21-17:21).	0.09
<u>RAW MATERIALS</u>		
C-136	"GRAB SAMPLE" - FRESHLY OPENED BOX OF GEON 80534. SAMPLE COLLECTED ABOUT TWO (2) INCHES ABOVE PELLETS, WITH PELLETS AGITATED DURING SAMPLE PERIOD.	2.0
C-137	"GRAB SAMPLE" - SECOND BOX OF FRESHLY OPENED GEON 80534. COLLECTED AS ABOVE, BUT WITHOUT AGITATION OF PELLETS.	3.4

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NOTES:

1. THE CURRENT "EMERGENCY STANDARD" FOR VINYL CHLORIDE IS 50 PPM, HOWEVER, THIS LEVEL IS GENERALLY CONSIDERED BY MEDICAL EXPERTS TO BE EXCESSIVE. A "NO DETECTABLE LEVEL", OR ONE PART PER MILLION (1 PPM) "LOWEST DETECTABLE LEVEL" HAS BEEN PROPOSED AS AN APPROPRIATE PERMANENT STANDARD.
2. SAMPLE 122-135 WERE COLLECTED FOR A CONTINUOUS PERIOD ON ACTIVATED CARBON/CHARCOAL. SAMPLES 136-137 WERE "GRAB SAMPLES" COLLECTED OVER A BRIEF PERIOD IN 250 ml GLASS COLLECTION TUBES.
3. ALTHOUGH THE SAMPLE RESULTS ARE SUBJECT TO A RELATIVELY LARGE RANGE FLUCTUATION (STANDARD DEVIATION), THE SMALL VALUES DO INDICATE A DETECTABLE QUANTITY THAT, AT A HIGH CONFIDENCE LEVEL, IS WELL BELOW 1 PPM.

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TABLE II
RESULTS OF AIR SAMPLING FOR VINYL CHLORIDE

<u>SAMPLE NO.</u>	<u>LOCATION (TIME) OF SAMPLE</u>	<u>RESULTS (PPM)</u>
C-138	AT WIRE LINE EXIT FROM HEAD OF EXTRUDER # 103B (4½-INCH), USING V-6103 DRY BLEND. (10:33-11:25).	0.06
C-139	SAME AS ABOVE, (11:38-12:24).	0.10
C-140	BREATHING ZONE OF OPERATOR (J.C.) OF EXTRUDER # 103B. (11:00-11:55)	0.15
C-141	AT HOPPER THROAT OF EXTRUDER #102 (2-INCH), USING V-5127 GRANULES. (10:47-11:39).	0.20
C-142	SAME AS C-141, (11:54-12:48).	0.13
C-143	AT WIRE LINE EXIT FROM HEAD OF EXTRUDER # 102. (12:07-13:07).	
C-146	"GRAB SAMPLE" - AT WIRE LINE EXIT FROM HEAD OF EXTRUDER # 102. (12:40)	0.54
C-144	BREATHING ZONE OF OPERATOR (D.R.) OF EXTRUDERS 101 AND 102. (11:06-12:08).	0.21
C-145	COLLECTED AT BOTTOM OF NORTH SILO.	0.27
C-147	"GRAB SAMPLE" - COLLECTED AT BOTTOM OF NORTH SILO.	1.1

NOTES:

1. THE CURRENT "EMERGENCY STANDARD" FOR VINYL CHLORIDE IS 50 PPM, HOWEVER, THIS LEVEL IS GENERALLY CONSIDERED BY MEDICAL EXPERTS TO BE EXCESSIVE. A "NO DETECTABLE LEVEL", OR ONE PART PER MILLION (1 PPM) "LOWEST DETECTABLE LEVEL" HAS BEEN PROPOSED AS AN APPROPRIATE PERMANENT STANDARD.
2. SAMPLES 138-145 WERE COLLECTED FOR A CONTINUOUS PERIOD ON ACTIVATED CARBON/CHARCOAL. SAMPLES 146-147 WERE "GRAB SAMPLES" COLLECTED OVER A BRIEF PERIOD IN 250 ml GLASS COLLECTION TUBES.
3. ALTHOUGH THE SAMPLE RESULTS ARE SUBJECT TO A RELATIVELY LARGE RANGE FLUCTUATION (STANDARD DEVIATION), THE SMALL VALUES DO INDICATE A DETECTABLE QUANTITY THAT, AT A HIGH CONFIDENCE LEVEL, IS WELL BELOW 1 PPM.

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