WV-0029 # 4

Mr. G. B. LaRoy
740-2419

June 19, 1973

Industrial Hygiene

Mr. N. H. Ketcham, 770-440
Dr. T. M. Spencer, 791
Mr. W. R. Thompson, 740-3415
Mr. F. A. Woods, 2000-4135

Asbestos Air Sampling Results

Dear Gene:

The attached report shows asbestos air sampling results that were received during sawing of Marinite 23, approximately 40% asbestos, in the large SID shop. Make-shift vacuum systems were used to control the asbestos dust which could have caused serious contamination and personnel exposure problems in this area.

This shop is not equipped to work with asbestos via sawing, machining, drilling, etc., that is necessary to prepare the heater attachments that are periodically produced. The precautions that must be taken to cut the asbestos boards are not adequate with the types of available equipment. The vacuum cleaners must be cleaned and handled carefully to prevent personnal exposures during and following completion of the work with almost any slight mishap causing exposure to unprotected personnel.

The second result shows the potential degree of hazard that exists during this type operation. We think this was caused when the board slipped from the fingers, raising a small cloud of asbestos dust from the sawed material. The discs were dusty and required vacuuming. Almost any form of careless handling could have created a hazardous atmosphere in the vicinity of the operation.

It is recommended that the asbestos discs be cut only with equipment that contains adequate exhaust and filter systems designed for work with this material.

Yours very truly,

Fred Williams

Fred Williams
Industrial Hygienist

FW:vad

Attachment

EMPLOYEE RELATIONS

UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS
SOUTH CHARLESTON, WEST VIRGINIA

MEMORANDUM

June 19, 1973

TO: Fred Williams
FROM: G. W. Bott
SUBJECT: Air Sampling While Sawing Asbestos Material

Summary

Four of five asbestos samples collected in the 740 large scale shop area exceed the Threshold Limit Value of 5 fibers per milliliter of air greater than 5 μ in length if the job was performed as an eight-hour day operation. This particular job was done in one hour.

Discussion

On June 12, 1973, the Industrial Hygiene group collected air samples to measure asbestos fibers during the sawing of 3" x 1" discs by [redacted] a machinist in the SID department. A Rockwell drill press fitted with a disc drill was used to cut Marinite 23 in Bldg. 740 large scale shop.

Mr. Robert Kokott, Sales Representative of Johns-Manville said Marinite 23 contained approximately 40% asbestos.

Vacuum was supplied to the cutting area by an industrial-type vacuum cleaner mounted to the drill press table. The airborne fibers were collected using membrane filter media, type AA, 0.8 μ pore diameter, white, 37mm in size, at 1 liter per minute flow rate.

Five samples were taken during the cutting operation; two "personal" samples and three "area" samples. The "personal" sampler was suspended from [redacted] neck as close to the breathing zone as practical. An area sampler was taped to the cutting table six inches from the disc drill, and another sampler was located six feet from the cutting area, five feet from the floor. Duplicate samples were taken of the breathing zone and the cutting area, six inches from the cutting drill. A single sample was taken six feet away. The samples were analyzed and calculated the same day as they were collected.

MEMORANDUM

Results and Conclusions

The attached data sheet shows asbestos fibers in excess of the Threshold Limit Values of 5 fibers per milliliter of air greater than 5 μ in length in both "personal" samples for the one hour period. A high number of fibers were found in the area samples which were placed six inches from the cutting area, (we expected these samples to be high). The "area" sample, six feet from the cutting area, was relatively clean.

An additional vacuum cleaner was recommended for clean-up and to help evacuate the cutting area.

The data suggests that this operation is dirty and should not be performed in this manner. The second vacuum cleaner should have been effective in reducing the airborne concentration in the vicinity of the cutting for the balance of the discs, 70 additional were needed.

G. W. Bott

G. W. Bott

GWB:vsd

Attachment

Date: June 12, 1973
By: Bott & Elliott

ASBESTOS SAMPLING

Bldg. 740 Large Scale Shop

SAMPLE NO.	DESCRIPTION	TIME	DURATION	AVERAGE COUNT	CONCENTRATION
1	Personal (cut 15 discs)	0906-0911 0915-0943	33 min.	10.5	8.58 fibers/ milliliter
2	6" from cutter (cut 5 discs)	0906-0922	16 min.	44.8	75.5 fibers
3	6" from cutter (cut 10 discs)	0924-0943	19 min.	4.25	6.03 fibers
4	6' from cutter (cut 10 discs)	0940-1012	32 min.	1.25	1.05 fibers
5	Personal (cut 10 discs)	0943-1010	27 min.	9.85	9.83 fibers

CALCULATIONS

$$\frac{(S-B) \times A}{C \times V \times 1000} = \text{concentration, fibers per milliliter} > 5\mu$$

A = area of the millipore filter in mm^2 (the 37mm diameter filters have an effective area of 855 mm^2)

B = average net fiber count of a blank filter

C = counting area in mm^2

S = average net fiber count for sample

V = total volume of air sampled, in liters (time x flow rate)

ASBESTOS COUNT RECORD SHEET

ANALYST #1 LOCATION 740 Shop Asbestos Discs

FLOW 16pm TIME 33 VOLUME 33 DATE 6/12/73

INITIALS [redacted] F.AREA Drill Press BLK.CNT.AV. 210

AV. COUNT 10.5 CONCENTRATION 8.58 Fibers

COMMENTS Personal Filter

5
28
33

	1	2	3	4	
0	2	5	1	5	13
	3	5	3	5	16
	2	2	2	8	14
	2	1	1	1	5
	2	2	1	3	8
5	4	0	5	3	12
	2	3	3	2	10
	7	1	1	1	10
	2	1	3	2	8
	1	2	2	1	6
10	2	1	1	2	6
	3	1	0	3	7
	3	0	6	9	18
	0	2	5	2	9
	2	0	5	0	7
15	2	3	2	4	11
	3	2	4	2	11
	0	0	3	2	5
	4	1	2	2	9
	2	3	9	1	15
20	[redacted]				
					210
25					

SUB-TOTALS

$$\frac{\left(\frac{210}{20}\right) \times 855}{.0317 \times 33 \times 1000} = 8.58 \text{ fibers}$$

.0317 x 33 x 1000

ASBESTOS COUNT RECORD SHEET

SAMPLE # 2 OPERATION 740 Shop - Asbestos Discs

FLOW 1 LPM TIME 16 MIN VOLUME 16 DATE 6/12/73

INITIALS [redacted] F.AREA Drill Press BLK.CNT.AV. 896

AV.COUNT 44.8 CONCENTRATION 75.5 Fibers

COMMENTS 6" From Cutter

	1	2	3	4	
0	26	28	11	16	81
	14	36	23	27	100
	12	14	11	14	51
	11	19	12	11	153
	10	15	11	5	41
5	11	12	17	6	46
	15	11	12	10	48
	6	6	6	8	26
	5	15	10	5	35
	8	5	6	8	27
10	8	9	5	6	28
	11	14	14	7	46
	9	10	5	7	31
	10	8	13	7	38
	12	10	11	10	43
15	7	8	12	10	37
	9	5	7	8	29
	13	10	12	15	50
	9	8	13	8	40
	13	12	9	12	46
20					~~956~~
					896
25					

SUB-TOTALS

75.5 fibers

$\frac{\left(\frac{896}{20}\right) \times 855}{.0317 \times 16 \times 1000}$ = 75.5 fibers

896

ASBESTOS COUNT RECORD SHEET

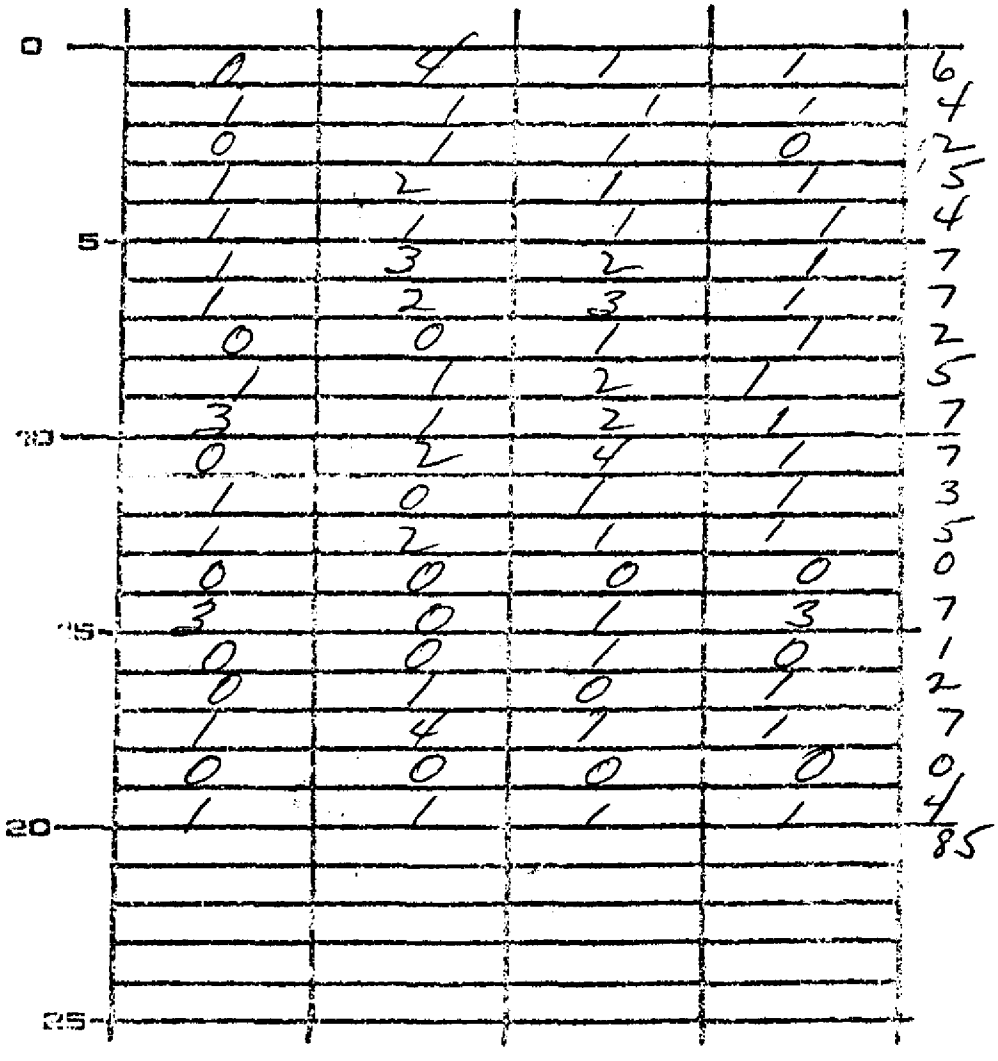
SAMPLE# #3 OPERATION 740 Shop - Asbestos Dust

FLOW 1 LPM TIME 19 min VOLUME 19 DATE 6/12/73

INITIALS [redacted] F.AREA Drill Press BLK.CNT.AV. 85

AV.COUNT 4.25 CONCENTRATION 6.03 Fibers

COMMENTS 6" From Cutter



SUB-TOTALS

$$\frac{\left(\frac{85}{20}\right) \cdot 855}{.0317 \times 19 \times 1000} = 6.03 \text{ Fibers}$$

ASBESTOS COUNT RECORD SHEET

SAMPLE NO. #1 OPERATION 740 Shop Asbestos Dust

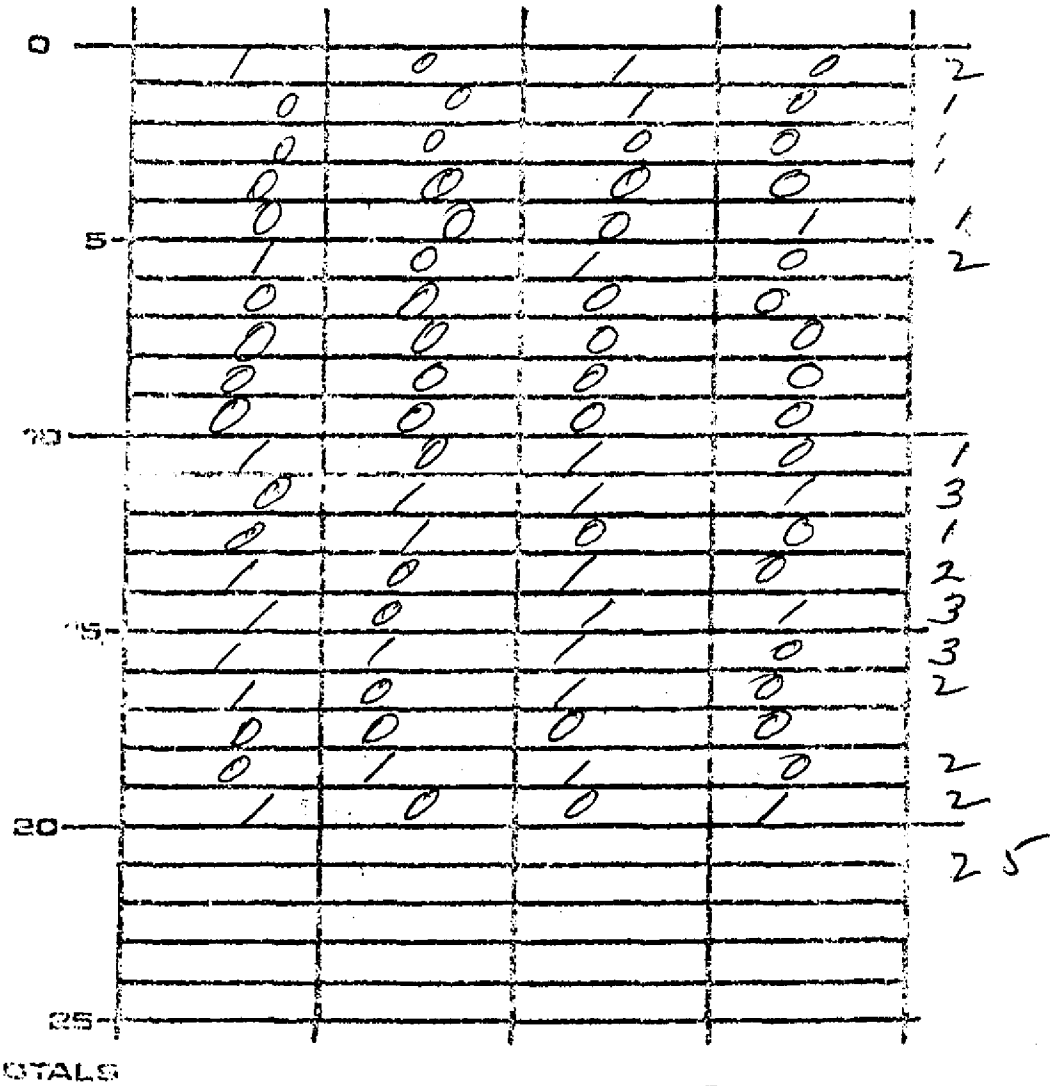
FLOW 1 LPM TIME 32 MIN. VOLUME 32 DATE 6/14/73

INITIALS [redacted] F.AREA Drill Press BLK.CNT.AV. 2.5

AV.COUNT 1.25 CONCENTRATION 1.05 Fibers

COMMENTS 6 ft from Cutter

← .1784
↔
.0091



SUB-TOTALS

29 KY-21a

$$\frac{(S-B) \times A}{\left(\frac{25}{20}\right) \times 855}$$

$$\overline{.0317 \times 32 \times 1000} = 1.05 \text{ fibers}$$

ASBESTOS COUNT RECORD SHEET

[illegible] 745 OPERATION 740 Shop - Asbestos Area

FILTER LRM TIME 27 MIN. VOLUME 27 DATE 6/[illegible]/73

INITIALS [redacted] F.AREA Drill Press BLK.CNT.AV. 197

AV.COUNT 9.85 CONCENTRATION 9.83 Fibers

COMMENTS Personal Filter (CENTER of Chest)

0	2	4	0	5	11
	1	2	4	0	7
	1	3	0	0	4
	3	2	5	1	11
	3	4	3	1	11
5	3	1	1	1	6
	2	2	2	2	8
	2	2	4	2	10
	9	6	2	3	20
	3	8	5	5	21
10	3	3	2	4	12
	2	2	2	5	11
	3	1	2	1	7
	2	3	1	1	7
	6	2	3	1	12
15	2	1	1	2	6
	1	1	1	1	4
	2	3	1	3	9
	1	2	2	4	9
	6	3	1	1	11
20					197
25					

SUB-TOTALS

$$\frac{\left(\frac{197}{20}\right) \cdot 855}{.0317 \times 27 \times 1000} = 9.83$$