

FILE NAME: RT Vanderbilt (RTV)

DATE: 2006 July 21

DOC#: RTV236

DOCUMENT DESCRIPTION: Vanderbilt Documents from Margaret Baumgardner

VIA FEDERAL EXPRESS

MARGARET J. BAUMGARDNER
RESEARCH COORDINATOR

July 21, 2006

Lawrence Madeksho
Law Offices of Lawrence Madeksho
8866 Gulf Freeway, Suite 440
Houston, TX 77017

Re: R.T. Vanderbilt

Dear Mr. Madeksho:

Enclosed are the documents from microfilm relating to R.T. Vanderbilt along with my affidavit. Below are the charges for this research. The charges include time for me to prepare an affidavit and have it notarized. Also included is time for me to prepare the INQUIRE search.

Research Coordinator's time	
1.5 hours x \$150.00 per hour	\$225.00
Production Assistant's time	
13.25 hours x \$55.00 per hour	\$728.75
Bates labels – 985 labels x \$.07 each	\$ 68.95
Copies, microfilm – 984 pages x \$.40 per page	<u>\$393.60</u>
TOTAL	\$1,416.30

Please forward a check for **\$1,416.30** payable to the *Claims Resolution Management Corporation*, to my attention in Aurora. If you have any questions, please do not hesitate to contact me.

Sincerely,



Margaret J. Baumgardner

cc: Joanne R. Marvin

Enclosures

AFFIDAVIT

STATE OF COLORADO)
) ss.
COUNTY OF JEFFERSON)

I, Margaret J. Baumgardner, being of full age and first duly sworn do hereby state:

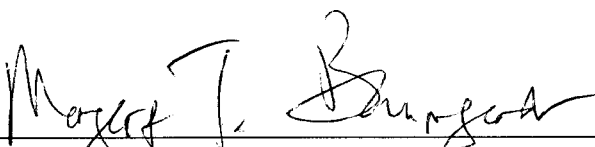
1. I am the Research Coordinator for the Claims Resolution Management Corporation ("CRMC"), a wholly owned subsidiary of the Manville Personal Injury Settlement Trust ("Trust"). The CRMC was created in December 1998 and is staffed by former Trust employees. On January 1, 1999, CRMC began providing claims resolution facility services to the Trust.

2. In this position, I manage the Asbestos Claims Research Facility ("Facility"), a document and records repository located at 3390 Peoria Street, Suite 304, Aurora, Colorado. The Facility contains the business records including but not limited to correspondence, memoranda, reports, records and data compilations ("record") of Manville Corporation or related entities ("Manville"), generally, as well as Manville records relevant to litigation of asbestos liability. The Trust has managed and operated the Facility from November 28, 1988, the date on which the Manville bankruptcy plan was consummated.

3. My experience and familiarity with the documents at the Facility began in 1983 while working for Manville. In my work as a paralegal for Manville, I assisted in locating, indexing and packing many of the records which became the foundation documents for the Facility. I continued to work for Manville until September 1987. From March 1988 to September 1988, I was hired to supervise and assist in the indexing of the first 20,000 boxes which were turned over to the Trust in November 1988. From September 1988 to January 1989, I assisted in the privilege review of documents to be given to the Trust. From November 1988 to April 1994, I worked for Freeborn & Peters and was put in charge of the Facility, managing all productions and "new" acquisitions. In September 1995, I was hired by the Trust to manage the Facility. In December 1998, I was hired by the CRMC to manage the Facility for the Trust. Accordingly, I am personally familiar with many of the records stored at the Facility, as well as how the records have been gathered.

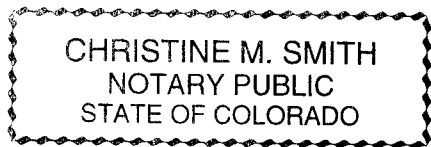
4. To the best of my knowledge, information and belief, I certify that these records were made at or near the time by, or from information transmitted by, a person with knowledge, were kept in the course of the regularly conducted business activity of Manville, and it was the regular practice and the business activity of Manville to make the records.

5. Documents from this Facility were copied for the Law Offices of Lawrence Madeksho. The copies have come from microfilm at the Facility and are bates labeled CRMC-MAD-000001 through CRMC-MAD-000985 and these documents are true and correct copies of documents found at the Facility.


Margaret J. Baumgardner

Subscribed and sworn to before
me this 21st day of July, 2006.


Notary Public



My Commission Expires 11/08/2008

C O P Y F O R M

INITIALS

DATE

BOX NUMBER

SEGMENT NO.

REQUESTING PARTY

Microfilm

Madakesha

Vanderbilt

N O T E S

CRMC-MAD-000001

FINAL REPORT

INDUSTRIAL HYGIENE STUDY OF THE GOUVERNEUR
TALC COMPANY, NUMBER ONE MINE AND MILL

Balmat, New York

Volume I

REPORT PREPARED BY
John M. Dement
Ralph D. Zumwalde

SURVEY DATE
November 3-7, 1975

FINAL REPORT DATE
June 8, 1977

Department of Health, Education, and Welfare
Center for Disease Control
National Institute for Occupational Safety and Health
Division of Surveillance, Hazard Evaluations and Field Studies
Cincinnati, Ohio

CRMC-MAD-000002

CONTENTS

Abstract	iii
Acknowledgements	iv
Introduction	1
Description of the Facilities	3
Description of Operations and Controls	5
Medical, Industrial Hygiene and Safety Programs	9
Inspection of Mine and Mill Operations	10
Potential Health Hazards	10
Housekeeping	10
Study Methods	11
Bulk Sample Collection and Analysis	11
Air Sampling and Analysis	13
Study Results	15
Bulk Sample Analyses	15
Air Samples	22
Comparison of Sampling and Analytical Methods	38
Comparison of Present and Past Exposures	45
Discussion	51
Conclusions and Recommendations	60
References	61
Appendixes	
I Mineral Product Safety Data Sheets for R.T. Vanderbilt Talcs	
II Results of Individual Air Samples and Summary Statistics for NIOSH Industrial Hygiene Study	

FIGURES

1 Gouverneur Talc Company, Inc. Simplified Flow Sheet	7
2 Aspect Ratios for Airborne Anthophyllite Fibers	32
3 Aspect Ratios for Airborne Tremolite Fibers	33
4 Electron Photomicrograph of Airborne Particulates	34
5 Electron Photomicrograph of Airborne Particulates	35
6 Electron Photomicrograph of Airborne Particulates	36
7 Comparison of Time-Weighted-Average Fiber and Respirable Dust Exposures, Mill Samples	39
8 Comparison of Fiber Concentrations by Optical and Electron Microscopy	43
9 Mean Yearly Impinger Dust Concentrations for Mine Operations	48
10 Mean Yearly Impinger Dust Concentrations for Mill Operations	49

TABLES

1 Sources of Talc Bulk Samples Obtained from Talc Suppliers	12
2 Summary of Independent Analyses of Talcs Produced at the Gouverneur Talc Company and Obtained from Suppliers	16

CONTENTS

Tables Con't

3	Summary of NIOSH Electron Microscopic Analyses of Talc Produced at the Gouverneur Talc Company and Obtained From Suppliers	17
4	Results of X-Ray Diffraction and Petrographic Microscopic Analyses of Talc Samples Collected During Study	18
5	Results of Trace Metal Analyses of Bulk Talc Samples Collected During Study	19
6	Results of Major Element Analyses of Gouverneur Talc Company Product Samples	21
7	Summary of Time-Weighted-Average Exposures by Job, Gouverneur Talc Company Number One Mine	23
8	Summary of Time-Weighted-Average Exposures by Job, Gouverneur Talc Company Number One Mill	24
9	Comparison of Optical and Electron Microscopic Fibers Concentrations	27
10	Summary of Airborne Fiber Types Determined by Analytical Electron Microscopy	28
11	Summary of Airborne Fiber Diameters for Positive Amphiboles	29
12	Summary of Airborne Fiber Lengths for Positive Amphiboles	30
13	Aspect Ratios for Positive Amphiboles Determined by Electron Microscopy	37
14	Summary of Stationary Samples for Correlation of Sampling Methods	40
15	Comparison of Impinger and Optical Fiber Count Results	42
16	Comparison of Optical and Electron Microscopic Fiber Concentrations	44
17	Summary of Historic Impinger Dust Measurements at the Gouverneur Talc Company	46
18	Summary of Historic Fiber Exposure Measurements at the Gouverneur Talc Company	47

ABSTRACT

A industrial hygiene study was undertaken at the Gouverneur Talc Company, number one mine and mill, during November 3-7, 1975. Samples were collected to evaluate exposures to respirable dust, free silica and asbestos fibers. In addition impinger samples were collected for comparison with past exposure measurements. Bulk product talc samples were also collected for mineralogical analyses by both NIOSH and independent consultant laboratories.

Results of mineralogical analyses of talc product samples by all laboratories concluded that asbestiform minerals (tremolite and anthophyllite) were present. Time-weighted-average fiber exposures in mine and mill operations were found to range from 1.7 to 9.8 fibers $> 5 \mu\text{m}/\text{cc}$ and time-weighted-average respirable dust exposures were found to range from 0.25 to 2.96 mg/m^3 . No free silica exposures were found to exceed the NIOSH recommended standard of 50 $\mu\text{g}/\text{m}^3$. Electron microscopic analyses of the airborne dusts showed 38 to 45% of airborne fibers to be anthophyllite with lesser quantities (12 to 19%) of tremolite. More than 90% of the airborne fibers were shorter than 5 μm in length.

A review of historic exposure data of these operations and epidemiological data concerning health effects of exposures to tremolite and anthophyllite are included in addition to recommendations for workplace improvements to reduce exposures.

ACKNOWLEDGEMENTS

Mike Grannan and Eric Kus of NIOSH and Jim Salois of MESA assisted in collection of the industrial hygiene samples. Mike Grannan, Robert Phillips and Kenneth M. Wallingford assisted in the optical asbestos fiber analyses and Terry Boyle and Dennis Roberts assisted in reduction of the field and laboratory data. Dr. D.R. Bowes of the University of Glasgow kindly performed major element analyses of talc bulk samples.

Analyses of talc bulk samples were performed by W.C. McCrone Associates and the Mt. Sinai School of Medicine of the City University of New York.

INTRODUCTION

The term "talc" in the mineralogical sense denotes a specific rockforming mineral of the sheet silicate category $[Mg_3 (Si_2O_5)_2 (OH)_4]$; however, "talc" in the industrial sense may represent a varied mixture of minerals with similar physical properties as talc.⁽¹⁾ Unfortunately, many past studies of the health effects of industrial talc exposures have not adequately identified the various hazardous agents which may have been present in the talcs.

The National Institute for Occupational Safety and Health (NIOSH) has underway an industrywide study of the talc mining and milling industry. These studies include both epidemiological studies of exposed worker populations to determine health effects which may be attributed to the work environment and detailed industrial hygiene studies to characterize the various agents to which these workers have been exposed.

The "talc" mining area in the vicinity of St. Lawrence County, New York, represents a complex association of amphiboles (anthophyllite, tremolite, etc.) talc, quartz, and serpentines.⁽¹⁾ Proportional mortality studies by Kleinfeld et.al.^(2,3) of talc miners and millers in this area have demonstrated significantly increased mortality due to both malignant and non-malignant respiratory diseases. Also, NIOSH analyses of talcs (Nytal 200) certified by the Vanderbilt Company not to contain asbestos have demonstrated significant contamination levels of both fibrous tremolite and fibrous anthophyllite.⁽⁴⁾ However, it has been stated that these studies are not appropriate since the mineral make-up of talc deposits in this area differ substantially with each deposit; some containing asbestos while others do not. One study⁽¹⁶⁾ has suggested differences in toxicity among these minerals.

Those questioning these studies base their arguments on the definition of a fiber (3 to 1 aspect ratio) as described in OSHA standards⁽⁸⁾ rather than mineralogical fiber identification. In order to resolve the question concerning the toxicity of these talcs, it was decided that NIOSH would conduct epidemiological mortality, morbidity, and industrial hygiene studies of the Gouverneur Talc Co. which produces Nyltal and other talcs which Vanderbilt contends do not contain asbestos. The Vanderbilt Company presently markets products from one mine and mill (#3) which the company admits to containing asbestos and are so labeled.

During November 3-7, 1975, an industrial hygiene study was conducted at the number one mine and mill of the Gouverneur Talc Company, Balmat, New York. Air samples were collected to evaluate worker exposures to asbestos fibers, respirable dust, free silica, and talc dust. A progress report of this study containing all personal exposure data was issued on May 25, 1976 which demonstrated exposures to asbestiform minerals to exceed current OSHA and MESA standards. This final report contains a description of facilities studied, sampling and analytical methods employed, sample results and conclusions and recommendations for workplace improvements to help protect employee health at this and other facilities using these or similar products.

DESCRIPTION OF THE FACILITIES

R.T. Vanderbilt began talc operations at the Gouverneur Talc Company in 1947 with one mine (#1) and one mill (#1). In 1974, the Vanderbilt Corporation acquired all talc operations of the International Talc Company. From this purchase, Vanderbilt was operating two mills (#3 and #6), one underground mine (#3 mine) and one open pit (Arnold Pit) at the time of this study. Only the #3 mine contains what the Vanderbilt Corporation considers to be fibrous anthophyllite and this ore is processed in the #3 mill.

The total employment at all R.T. Vanderbilt New York talc operations at the time of the present study was approximately 170 persons. These are broken down as follows:

Underground	- 41
Open Pit	- 13
Mills	- 67
Salaried	- 49
	170

Employees of these operations are represented by Local #4979 of United Steel Workers which organized in these talc operations in 1954. All operations were on a 54 day per week schedule with the mine operating only during the day shift while the mill operates three shifts. A list of jobs and a description of related duties in the number one mine and mill are given in Appendix II.

Approximately 19 talc products from all of the Company's New York talc operations are marketed. Mineral Product Safety Data Sheets for these products (supplied by R.T. Vanderbilt), are shown in Appendix I. These talcs are used in numerous products. Some typical uses are as follows:

1. Ceramic wall tile
2. Pottery artware
3. Electrical insulators
4. Ceramic tile glaze and flux
5. Paint filler and carrier for extenders
6. Putties and spackling compounds
7. Die castings (fibrous grades)

CRMC-MAD-000010

DESCRIPTION OF OPERATIONS AND CONTROLS

GOUVERNEUR TALC CO. MINE AND MILL (#1 MINE, ARNOLD PIT AND #1 MILL)

Surface facilities include the main office, mine office, quality control laboratory, change room, crusher building and pecker building.

Underground hard rock mining methods are employed using jackleg drills to make holes for blasting the ore in open stopes. The number one mine consists of one main shaft 1250 feet in depth with three main working levels branching off. During the present survey, ore was being mined from approximately 6 of 26 active stopes. According to Company personnel, mining follows a typical cycle: blasting is done with gelatin dynamite and ANFO; time is allowed for dust and gases to dissipate; stoping operations are begun including drilling for the next shifts, blasting, and removal of ore. However, some secondary blasting is done during the work shift.

Ore (muck) from the stoping areas is loaded into 2 ton rail cars using either gravity drawpoint loading or scraper (slusher) loading. Ore from these cars is discharged into a central jaw crusher located at the 700 ft. level although some crushing is also done on the 1110 ft. level. The crushed ore is loaded into a skip and carried to the mine headframe where a gyratory crusher reduces the ore to approximately 3/4 inch screen size. The ore is then transported by conveyor belt to one of four wet ore storage bins in the mill.

Approximately 40,000 cfm of mining ventilation is provided to this mine. In addition, the ore may be quite moist, thereby further reducing dust exposures. Drilling is usually done using wet methods. At the 700 ft. level crusher, water sprays are also used for dust suppression.

In addition to ores from the number one mine, the number one mill also receives ores for first stage crushing from the Arnold Pit located approximately one mile from the mill. Ores are mined from the Arnold Pit using traditional hard rock open pit mining methods by drilling blastholes then blasting to break the ore. A front loader is used to load ore into trucks by which the ore is transported to the primary crushers which are located at the open pit. There are no dust collectors on the open pit crusher.

In the number one mill, various grade talc products are produced by dry grinding operations. A simplified flow sheet for the milling operations is given in Figure 1.

Ores from the wet ore storage bins are periodically sampled by the quality control lab to determine appropriate product grade. The ores are first ground in a cone crusher followed by drying in a rotary dryer. The dry ore is next further reduced using a gyratory disc crusher to produce a minus 12 to 14 mesh product. The product is next screened on vibratory screens and transported to one of six dry ore silos. Fine grind products are made from these ores using either Hardinge pebble mills in closed circuit with Raymond separators or impact crushers in closed circuit with fluid energy mills.

The fine ground powder is stored in one of several concrete silos. These silos are filled using a bottom filling technique patented by R.T. Vanderbilt. Material from these silos is withdrawn by air slides and pumped to the packaging and shipping areas.

FIGURE 1

GOUVERNEUR TALC COMPANY, INC.

SIMPLIFIED FLOW SHEET

Underground Mine* - 5 Grades of ore

Underground Jaw Crusher

(Minus 4" Material)

Main Shaft - 6 Ton Skip

Hoisting Capacity - 90 Tons per hour

Surface Gyratory Crusher

(Minus 1" Material)

Belt Conveyor to Mill

Automatic Sampler*

4 Wet Ore Bins - Capacity-90 Tons each

Fine Crushing and Drying Circuit

(Minus 12 Mesh Material)

5 Dry Ore Silos - Capacity-500 Tons Each

Pebble Mill Grinding Circuit*

3 - 10 ft. x 66" Pebble Mills
in closed circuit with 3
Air Separators

Coarsely Ground
Material

Fluid Energy Grinding Circuit*

14 Fluid Energy Mills using
heated compressed air

Finished Product

Finished Product

Total Capacity of Grinding Circuits is 600 Tons per day

Vibrating Screens

Vibrating Screen

(To remove tramp material)

(To remove tramp material)

Low Pressure Air Conveying System

Low Pressure Air Conveying System

Alpine Classifying Circuit*

4 - Mikroplex 800 units

L.P. Air Conveying System

(Note - All finished product silos filled from bottom
for better mixing of silo contents)

6 Finished Product Silos

2 Finished Product Silos

5 Finished Product Silos

Capacity - 90 to 400
Tons each

Capacity - 400 Tons each

Capacity - 70 to 1500
Tons each

Low Pressure Air Conveying Systems

Bag Packing Plant

Hopper Cars*

for bulk shipments

50 lb. multi wall bags

Track Scales

Box Cars*

Trucks*

CRMC-MAD-000013

* - Sampling Point

Talc may be either sold in bulk or packaged in 50 lb. valve type Kraft paper bags. Bag packaging is done using pneumatic packing machines.

In general, ventilation systems within the mill are quite good. Most material transfer points are provided with local exhaust ventilation and bucket elevators and conveyors are maintained under negative pressure. At the bagging machines, local exhaust ventilation is provided at the filling spout in addition to downdraft ventilation at the bag hopper. For bulk car loading, the telescopic loading spout is provided with a local exhaust ventilation collar.

Air pollution controls consist largely of baghouse dust collectors, although a cyclone is used on the mine headframe gyratory crushers. Much of the collected material is recycled to the product streams. No products from the number one mine or Arnold Pit were being labeled with the OSHA asbestos warning at the time of this study.

OTHER MINES AND MILLS

The #3 mine was not observed during this study. The #3 and #6N mills were observed during a previous visit. The #3 mill produces products considered by the Company to contain anthophyllite asbestos. These products are labeled with the OSHA asbestos warning label. Milling operations at these mills are basically the same as those previously described for the #1 mill with minor variations. Dust control measures are not, however, as effective as those observed in the #1 mine and are being further improved.

MEDICAL, INDUSTRIAL HYGIENE AND SAFETY PROGRAMS

Only first-aid medical facilities are available at the Gouverneur Talc Co. New employees are given a pre-employment examination consisting of a work history, medical history, physical examination, and chest x-ray. Periodic examinations including a chest x-ray have been given at yearly intervals. All examinations are given by a local physician who consults with the Plant.

Plant safety is handled by a Plant Safety Director (Floyd Robinson). Monthly departmental safety inspections are conducted by Union and Plant personnel in addition to monthly safety meetings. Personnel protective equipment presently used in the mine includes hard hats, mine lights, personnel rescuers, safety glasses, and safety boots all of which are provided by the Company. In the mill, safety glasses are encouraged and workers at talc bagging operations are provided with dust masks which, according to observations made during this study, are only sporadically used. Hearing protection is provided for specific operations in the mill and mine. In 1974, there were 9 reported (lost time) accidents in the mine and 2 in the mill.

The Company presently does not maintain the services of a full time industrial hygienist. Some sampling is conducted by the Plant Safety Director in addition to yearly sampling by the insurance carrier. Air sampling in these operations has also been conducted by the New York Division of Industrial Hygiene and the Mining Enforcement and Safety Administration (MESA).

INSPECTION OF MINE AND MILL OPERATIONS

POTENTIAL HEALTH HAZARDS

The following are potential health hazards noted during this visit:

1. Respiratory exposures to mineral dusts (fibrous and non-fibrous tremolite and anthophyllite, talc, serpentine, quartz, etc.) in mining and milling operations.
2. Excessive noise exposures in selected plant operations.
3. Exposures to blasting gases in mining operations during secondary blasting.

HOUSEKEEPING

In general, housekeeping in these operations was judged to be acceptable. Some loose talc was, however, noted on the floors in the talc bagging operations. Numerous leaks at material transfer points were noted in the mill.

Table 1

Sources of R.T. Vanderbilt Talcs Produced at
the Gouverneur Talc Company, Number One Mine
and Mill and Obtained from Suppliers

Product Name	Source	NIOSH #
Nytal 300	Crone Chemical	001
Nytal 400	P.O. Box 14042 Houston, Texas 77021	002
5X		003
325		004
X	Paul Crazier Company 1115 Silver St.	005
FT	Houston, Texas 77007	006
3X		007

STUDY METHODS

BULK SAMPLE COLLECTION AND ANALYSIS

Bulk samples of products being produced and bagged during the industrial hygiene study were collected for laboratory mineralogical assay. In addition, seven talc samples produced at this mine and mill were collected from independent talc suppliers (Table 1) for mineralogical assay. Several ore samples were also collected during mine sampling.

Analyses of collected bulk samples were performed by both NIOSH and independent consultant laboratories. The seven talc bulk samples collected from talc suppliers were submitted to both Walter C. McCrone Associates Incorporated and to the Mount Sinai School of Medicine for independent analysis by x-ray diffraction, optical microscopy and electron microscopy. These same samples were also analyzed by NIOSH for the presence of asbestiform fibers by electron microscopy using electron diffraction and energy dispersive x-ray analysis for fiber identification. (7)

Bulk samples collected during the industrial hygiene study were submitted to Walter C. McCrone Associates Incorporated for mineralogical analyses by x-ray diffraction (using step scanning methods) and optical microscopic analyses. These same samples were analyzed by NIOSH for selected trace metals by atomic absorption spectroscopy (after acid digestion).

In addition to the above analyses, several products produced at the number one mine and mill and submitted to NIOSH by Vanderbilt were analyzed for chemical composition by Dr. D.R. Bowes of the Department of Geology, the

CRMC-MAD-000018

University of Glasgow. For these analyses, Dr. Bowes used spectrophotometry for SiO_2 , TiO_2 , Al_2O_3 , total Fe (Fe_2O_3 by difference from FeO) and P_2O_5 determinations. Atomic absorption analysis was used for MnO, MgO and CaO. Flame photometry was used for Na_2O and K_2O and wet chemical assay was used for FeO. (10)

AIR SAMPLING AND ANALYSIS

Personal air samples were collected from the breathing zone (miners and millers) to determine time-weighted-average exposures to respirable dust, free silica, and asbestos fibers. Personal samples for respirable dust and free silica were collected at a flow rate of 1.7 lpm using 37 mm diameter polyvinyl chloride filters (pre-weighed) preceded by 10 mm nylon cyclone separators. Samples for asbestos fiber analysis were collected on open faced 37 mm diameter Millipore Type AA filters (0.3 μm pore size) at a flow rate of 1.7 lpm. Respirable samplers were allowed to operate for the full work shift while asbestos samples were changed periodically during the work shift as needed to prevent overloading of filters.

Free silica concentrations were determined using x-ray diffraction as specified in the NIOSH Silica Criteria Document. (5) All asbestos samples were analyzed using the NIOSH phase contrast counting technique. (6) In addition, a representative portion of the asbestos samples were randomly chosen and analyzed by electron microscopy using selected area electron diffraction and energy dispersive x-ray analysis for fiber identification. Electron microscopy was also used to determine airborne fiber concentrations, and size (diameter and length) distributions. (7) Samples for electron microscopic analysis were prepared using a modification of methods described by Ortiz. (9)

In order to relate results of the present industrial hygiene study to past studies in these operations, midget impinger samples also were taken in a manner identical to past sampling techniques. Breathing zone impinger samples were collected in ethyl alcohol at a flow rate of 0.1 cfm with sampling periods ranging from 15 to 30 minutes. These samples were counted at the end of each work shift using Dunn counting cells and bright field optical microscopy (100X). Two preparations were made for each sample and allowed to settle for 30 minutes and counts made by two counters. When counts differed by more than 10%, new preparations were made and recounted.

In addition to personal sampling, stationary samples were taken to further attempt correlations between impinger counts, respirable mass concentrations, total mass concentrations, and asbestos fiber concentrations. Midget impingers were collected as described above using a sequential sampler (24 samplers) such that the entire work shift was sampled. Simultaneously, respirable and total mass samples were collected at flow rates of 10 lpm using 37 mm diameter polyvinyl chloride filters (pre-weighed). The respirable samples were collected using stainless steel cyclone and free silica analyses of the respirable dust performed using x-ray diffraction.⁽⁵⁾ Asbestos count samples were collected and analyzed as described above for personal samples.

STUDY RESULTS

BULK SAMPLE ANALYSES

Results of analyses of the seven talc samples obtained from suppliers are shown in Tables 2 and 3. Copies of the reports submitted by McCrone and Mt. Sinai and analytical data obtained by NIOSH are given in Volume II of this report. These reports all concluded that asbestiform tremolite and anthophyllite were present in these samples. In addition, Mt. Sinai and NIOSH reported trace quantities of chrysotile in some samples. The only major discrepancy notable is a higher quartz content for each sample reported by Mt. Sinai. NIOSH analyses tend to support the lower McCrone results which is substantiated by the air sample results.

Results of NIOSH electron microscopic analyses of these talcs, given in Table 3, show that a majority of the fibrous particles in these samples are anthophyllite (67 to 88%) with smaller quantities of tremolite (4 to 12%). A large majority of the tremolite identified by x-ray diffraction is not fibrous. Anthophyllite fibers with very large aspect ratios (1000/1) were observed. A close association between talc and tremolite has been demonstrated by Stemple and Brindley. (15)

Results of further x-ray diffraction and petrographic microscopic analyses (McCrone) of product samples collected during the study are shown in Table 4. These results are in basic agreement with previous results given in Table 2. As can be seen in Table 5, all trace metals for which analyses were performed, with the exception of iron and manganese, were essentially absent. Only insignificant quantities of iron and manganese were detected.

Table 2

Summary of Independent Analyses of
Tales Produced at the Gouverneur Talc
Company Number One Mine and Mill.
Samples Obtained From Talc Suppliers

Mineral Phase	Percent Composition By Weight						
	Nyral 400	Nyral 300	5X	X	3X	FT	325
Tremolite McCrone Mt. Sinai	50-60 24	40-50 18	40-50 27	>50-60 50-60	50-60 32	50-60 17	~60 24
Anthophyllite McCrone Mt. Sinai	Present 2-3	* 4-5	Present 7-9	Present ---	* *	* *	* 5-7
Quartz McCrone Mt. Sinai	0.5-1.0 7-10	2 9-10	~1.5 8-9	<0.5 9-10	0.5-1.0 7-8	** **	~1.5 3-4
Serpentines McCrone Mt. Sinai	10-15 14-18	10-15 14-18	10-12 14-18	~15 26-30	~30 31-35	~20 26-30	10-12 19-23

* Below detection limits using x-ray diffraction (line scan by McCrone, step scanning by Mt. Sinai).

** Below detection limits by step scanning.

Table 2

Summary of Independent Analyses of
Tales Produced at the Gouverneur Talc
Company Number One Mine and Mill.
Samples Obtained From Talc Suppliers

Mineral Phase	Percent Composition By Weight						
	Nyral 400	Nyral 300	5X	X	3X	FT	325
Tremolite McCrone Mt. Sinai	50-60 24	40-50 18	40-50 27	>50-60 50-60	50-60 32	50-60 17	~60 24
Anthophyllite McCrone Mt. Sinai	Present 2-3	* 4-5	Present 7-9	Present ---	* *	* *	* 5-7
Quartz McCrone Mt. Sinai	0.5-1.0 7-10	2 9-10	~1.5 8-9	<0.5 9-10	0.5-1.0 7-8	** **	~1.5 3-4
Serpentines McCrone Mt. Sinai	10-15 14-18	10-15 14-18	10-12 14-18	~15 26-30	~30 31-35	~20 26-30	10-12 19-23

* Below detection limits using x-ray diffraction (line scan by McCrone, step scanning by Mt. Sinai).

** Below detection limits by step scanning.

Table 3

Summary of NIOSH Electron Microscopic
Analyses of Talc Produced at the
Gouverneur Talc Company
Number One Mine and Mill
Samples Obtained From Talc Suppliers

Talc Sample	Range of Fiber Aspect Ratios	Fiber Identification (Percent)**				
		Positive Amphiboles		Positive Chrysotile	Non Asbestos	Not* Identified
		Tremolite	Anthophyllite			
Ytal 400	3/1 to 1000/1	8	88	N.D.	4	---
Ytal 300	3/1 to 100/1	12	72	N.D.	4	12
5X	5/1 to 100/1	11	80	Trace	4	5
X	8/1 to 80/1	6	80	N.D.	2	12
2X	5/1 to 100/1	12	67	N.D.	4	16
11	3/1 to 50/1	16	72	N.D.	4	8
125	3/1 to 50/1	4	88	Trace	7	---

Selected area diffraction patterns not sufficient for positive identification

Percent = % of all fibers analyzed by count and not by mass. All fiber lengths analyzed

None Detected

Table 4

Results of X-Ray Diffraction and Petrographic Microscopic
Analyses of Bulk Talc Samples Collected During Study
Gouverneur Talc Company, Number One Mine and Mill

Mineral Component	Sample Analyses, % By Weight					
	Talc FT	Nyral 100	Ceramatalc HDT	Nyral 200	Nyral 300	Nyral 200
Talc	31-36	43-48	30-35	33-38	35-40	~14
Fremolite	~40	~37	~49	~43	~38	~59
Anthophyllite	~10	~4.5	~5	~8	10	15
Quartz	2.6	<0.25	<0.25	0.7	0.8	1.1
Calcite	1	<0.5	0	0	<0.5	<1
Dolomite	1	<0.5	<0.5	<0.5	<0.5	<0.5
Serpentines *	10-15	10-15	10-15	10-15	10-15	~10

* Includes lizardite and antigorite.

Table 5

Results of Trace Metal Analyses of Bulk Tale
 Samples Collected during Study
 Governed Tale Company, Number One Mine and Mill

Product Name	Date Collected	Trace Metal, ppm*						
		Cr	Co	Fe	Mn	Ni	Zn	Cd
Tale 11	11/4/75	3	1	1100	1700	7	20	<1
Nyral 100	11/4/75	3	<1	1000	840	5	19	<1
Nyral 100 EBT	11/4/75	2	2	890	1000	6	17	<1
Nyral 200	11/4/75	3	2	970	1300	7	20	<1
Nyral 300	11/3/75	2	3	1000	1700	5	23	<1
Nyral 200	11/3/75	3	2	900	1400	5	22	<1

* Trace metals determined by atomic absorption spectroscopy

Results of major element analyses by Dr. Bowes are shown in Table 6. The high CaO content of these talcs correlates reasonably well with the observed high tremolite content. Other carbonates except traces of calcite are absent or negligible in these talcs as demonstrated by low CO₂ values.⁽¹³⁾ The Fe and Mn analyses are consistent with the results shown in Table 5. These major element analyses are in basic agreement with results obtained by Ross et.al.⁽¹⁴⁾ for talcs in the Arnold Pit and by Dreessen⁽¹⁸⁾ for talcs in this area. Ross et.al. also suggested that an additional manganese-rich amphibole, tirodite, may be found in trace quantities in these deposits. Also, the major element analyses shown in Table 6 do show 0.12 to 0.22% MnO; however, no manganese-rich amphiboles were detected by the electron microscope analyses using selected area electron diffraction and microchemical analysis.

Table 6

Results of Major Element Analyses of Gouverneur
Talc Company, Number One Mill, Product Samples*

Major Element	Sample Analyses, % By Weight*							
	Nyral 100	Nyral 200	Nyral 400	Ceramitalc 1	Ceramitalc 10A	Ceramitalc 10AC	Ceramitalc HDT	Talc Stds**
SiO ₂	54.85	54.52	56.11	56.14	52.81	52.47	55.47	61.49
TiO ₂	0.04	0.15	0.07	0.03	0.08	0.04	0.07	0.01
Al ₂ O ₃	0.38	0.32	0.13	0.13	0.16	0.11	0.13	1.20
Fe ₂ O ₃	0.10	0.13	0.08	0.11	0.08	0.06	0.11	0.38
FeO	0.04	0.03	0.05	0.03	0.03	0.01	0.03	1.07
MnO	0.21	0.20	0.22	0.15	0.12	0.10	0.12	0.00
MgO	28.40	28.78	29.40	29.56	30.20	30.56	29.10	30.54
CaO	9.02	8.53	7.50	7.40	8.15	8.30	8.25	0.46
Na ₂ O	0.28	0.44	0.18	0.25	0.38	0.16	0.18	--
K ₂ O	0.10	0.17	0.10	0.10	0.10	0.10	0.13	--
P ₂ O ₅	0.03	0.03	0.03	0.03	0.03	0.03	0.03	--
H ₂ O	5.37	5.07	5.00	5.56	6.07	6.67	5.24	5.00
CO ₂	1.35	1.15	1.03	0.96	1.30	0.98	0.84	5.00
Loss	100.17	99.52	99.90	100.45	99.51	99.59	99.59	

Samples submitted to NIOSH by R.T. Vanderbilt, Analyses performed by Dr. D.R. Bowes, University of Glasgow.

*From talc standard analyses in reference 10.

CRMC-MAD-000028

AIR SAMPLES

A brief description of each job, sampling and analytical methods used, results of all individual samples and appropriate summary statistics are shown in Appendix II. Jobs are identified by 4 digit job codes. Tabular summaries of time-weighted-average exposures by job category for the mine and mill are given in Tables 7 and 8, respectively.

Tables 7 and 8 show free silica exposures to be very low. The highest time-weighted-average free silica exposure observed was 0.040 mg/m^3 which is below the 8 hour time-weighted-average exposure value of 0.05 mg/m^3 recommended by NIOSH for this material.⁽⁵⁾ Respirable dust exposures ranged from 0.25 to 2.96 mg/m^3 . No respirable dust standard has been determined for the mineral talc or talc containing fibrous tremolite or anthophyllite.

Breathing zone impinger concentrations ranged from 0.5 to 15.8 million particles per cubic foot of air (mppcf) with highest concentrations being observed in the mine. The present OSHA and MESA standard for "talc" containing $< 1\%$ free silica and no asbestos fibers is 20 mppcf .⁽⁸⁾

Due to its fiber content, the occupational asbestos exposure standard must be applied to exposures to materials from these mining and milling operations. Time-weighted-average asbestos fiber exposures in excess of five fibers $> 5 \text{ }\mu\text{m/cc}$ were observed for the following job categories:

- (1) Mine Crusher Operator
- (2) Trammer
- (3) Mine Cageman

Table 7

Summary of Time-Weighted-Average Exposures
By Job, Gouverneur Talc Co. Number One Mine

Job Code	Job Title	Asbestos fibers > 5 $\mu\text{m}/\text{cc}$ (Optical Microscopy)	Resp. Mass mg/m^3	Impinger mppcf	Free SiO_2 mg/m^3
0102	Crusher Operator	9.8 (4)	--	--	--
0103	Trammer	5.6 (25)	0.64 (3)	10.1 (3)	0.020 (3)
0104	Scraper Man	--	1.29 (3)	11.8 (5)	0.012 (3)
0105	Underground Laborer	--	0.58 (1)	--	0.006 (2)
0106	Driller	3.0 (5)	0.98 (3)	00.7 (1)	0.014 (2)
0114	Mucker	--	--	15.8 (1)	--
0115	Cageman	9.5 (5)	0.23 (1)	2.0 (1)	--
0301	Repairman	--	1.14 (1)	--	--
0302	Repairman's Helper	--	0.86 (1)	3.6 (1)	0.000 (1)
0303	Blacksmith	2.6 (3)	--	--	--
0304	Maintenance Mechanic	1.7 (12)	0.42 (1)	1.5 (1)	0.000 (1)

() = Number of samples used for calculation of time-weighted-average values for each job category. Samples for respirable mass and free SiO_2 were full shift samples.

CRMC-MAD-000030

Table 8

Summary of Time-Weighted-Average Exposures
By Job, Gouverneur Tale Co. Number One Mill

Job Code	Job Title	Asbestos fibers > 5 $\mu\text{m}/\text{cc}$ (Optical Microscopy)	Resp. Mass mg/m^3	Impinger mppcf	Free SiO_2 mg/m^3
0201	Mill Foreman	5.3 (9)	0.58 (2)	2.9 (2)	0.013 (2)
0203	General Laborer	5.6 (5)	1.14 (1)	0.5 (1)	0.014 (1)
0204	Crusher Operator	5.1 (16)	0.85 (2)	2.6 (4)	0.020 (2)
0206	Harding Operator	7.9 (14)	1.09 (2)	3.4 (2)	0.012 (1)
0208	Wheeler Operator	8.4 (14)	1.56 (2)	3.1 (2)	0.012 (1)
0209	Packer	5.1 (48)	0.59 (9)	3.6 (6)	0.010 (7)
0211	Packer Serviceman	3.6 (11)	0.42 (2)	2.1 (1)	0.007 (2)
0212	Packhouse Foreman	1.5 (5)	0.25 (2)	--	0.014 (2)
0213	Fork Lift Operator	4.0 (15)	0.35 (3)	1.6 (2)	0.000 (1)
0214	Car Liner	3.4 (4)	0.31 (1)	--	0.000 (1)
0220	Bulk Car Loader	2.0 (3)	0.25 (1)	--	0.016 (1)
0401	Millwright	1.9 (3)	2.37 (2)	--	0.040 (2)
0402	Instrument Repairman	2.8 (6)	0.59 (2)	--	0.000 (1)
0403	Machinist	1.8 (3)	0.40 (1)	--	0.016 (1)
0405	Millwright Helper	4.0 (2)	2.96 (1)	--	0.000 (1)
0406	Sheet Metal Worker	1.7 (3)	0.50 (1)	--	0.013 (1)
0410	Oiler	4.0 (4)	0.72 (1)	--	0.016 (1)
0411	Welder	1.9 (3)	0.75 (1)	--	

() = Number of samples used for calculation of time-weighted-average values for each job category. Samples for respirable mass and free SiO_2 were full shift samples.

CRMC-MAD-000031

- (4) Mill Foreman
- (5) Mill Laborer
- (6) Crusher Operator
- (7) Hardinge Operator
- (8) Wheeler Operator
- (9) Packer

In addition, 17 of the 24 job categories samples had time-weighted-average exposures exceeding the current OSHA standard of 2.0 fibers > 5 $\mu\text{m}/\text{cc}$ ⁽⁸⁾ and all operations exceeded the OSHA proposed standard of 0.5 fibers > 5 $\mu\text{m}/\text{cc}$.⁽¹²⁾

The following job categories had exposures in excess of the OSHA and MESA allowable ceiling value of 10 fibers > 5 $\mu\text{m}/\text{cc}$:

- (1) Mine Crushers Operator
- (2) Trammer
- (3) Mine Cageman
- (4) Mill Foreman
- (5) Mill Laborer
- (6) Crushers Operator
- (7) Hardinge Operator
- (8) Wheeler Operator
- (9) Packer

Individual sample results, as determined by electron microscopy, are shown in Table 9 and time-weighted-average fiber concentrations by job are shown in Table 14 of Appendix II. In these tables, "positive asbestos" means only those identified by electron diffraction; therefore these concentrations

represent minimum estimates of true total airborne asbestos concentrations. As shown in Appendix II, time-weighted-average positive asbestos fiber exposures as determined by electron microscopy ranged from 9.5 to 70.6 fibers/cc (all lengths) with concentrations in the mill tending to be slightly higher. As shown in Table 9, total fiber concentrations (all types and lengths) for individual samples ranged from 11.6 to 189.5 fibers/cc.

A summary of airborne fiber types as determined by electron microscopy is shown in Table 10. In the mine, 38% of the airborne fibers were identified as anthophyllite while 19% were tremolite and 39% were unidentified. In the mill, 45% of the fibers were anthophyllite, 12% tremolite and 38% unidentified. Three percent of the fibers in the mine and 2% in the mill gave chrysotile electron diffraction patterns. The presence of chrysotile in the air samples is consistent with the results of bulk sample analyses by Mt. Sinai and NIOSH where trace quantities of chrysotile were noted in some samples. All chrysotile fibers observed in the air samples were less than 1 μ m in length. Nearly all of the serpentine minerals identified in the bulk samples is lizardite.

Results of airborne fiber size determinations (diameter and length) for tremolite and anthophyllite fibers are shown in Tables 11 and 12 with appropriate summary statistics. As was expected, tremolite fibers tended to be larger in diameter and shorter in length than anthophyllite fibers with size distributions for these minerals being similar for the mine and mill. Median fiber diameters of 0.19 and 0.13 μ m were observed for tremolite and anthophyllite, respectively. In the mine, median fiber lengths of 1.6 μ m for tremolite and 1.5 μ m for anthophyllite were observed. Similar lengths

Table 9

Comparison of Optical and Electron Microscopic Fiber
Concentrations, Gouverneur Talc Company, Number One Mine and Mill

Sample #	Job Code	Job Title	Fibers/cc			
			Electron Microscopy			Optical ≥ 5µm
			Post. Asbestos*	Total Fibers	All ≥ 5µm	
G194	0103	Trammer	20.2	42.1	1.2	3.5
G156	0103	Trammer	22.6	29.8	5.9	2.7
G149	0103	Trammer	13.2	27.8	2.4	4.2
G237	0103	Trammer	8.9	19.1	2.0	4.7
G246	0106	Driller	9.5	14.4	1.3	No count
G223	0115	Cageman	17.5	30.3	2.2	6.0
G04	0201	Mill Foreman	18.4	28.8	5.3	5.8
G42	0201	Mill Foreman	33.7	70.0	7.0	5.3
G98	0203	General Laborer	36.6	64.9	9.3	5.9
G146	0203	General Laborer	9.0	14.9	1.3	2.9
G77	0204	Crusher Operator	9.0	45.5	2.8	3.3
G38	0204	Crusher Operator	15.6	27.2	4.4	2.2
G101	0206	Hardinge Operator	102.7	189.5	6.2	8.9
G22	0206	Hardinge Operator	33.6	51.5	4.2	5.5
G144	0208	Wheeler Operator	18.2	31.8	4.1	6.8
G02	0208	Wheeler Operator	25.5	37.4	4.0	6.0
G96	0209	Packer	31.9	57.5	4.8	1.2
G47	0209	Packer	41.8	73.5	8.5	3.2
G85	0211	Packer Serviceman	7.3	11.6	0.5	1.6
G10	0211	Packer Serviceman	26.7	34.7	4.4	4.2
G113	0212	Packhouse Foreman	13.6	18.4	1.4	1.6
G05	0212	Packhouse Foreman	16.2	28.4	5.7	1.1
G31	0213	Fork Lift Operator	36.0	71.9	8.7	3.3
G197	0304	Maintenance Mechanic	16.7	26.6	1.7	2.3
G180	0403	Machinist	24.9	42.5	3.6	3.6
G197	0411	Welder	9.9	14.6	2.1	3.1

* Includes only those giving identifiable electron diffraction patterns; therefore, represents a conservatively low estimate.

CRMC-MAD-000034

Table 10

Summary of Airborne Fiber Types Determined By
Analytical Electron Microscopy
Gouverneur Talc Company, Number One Mine and Mill

Operation	Percent of Airborne Fibers (All Lengths)				
	Positive Amphiboles*		Positive Chrysotile	Non Asbestos	Not Identified***
	Tremolite**	Anthophyllite**			
Mine	19	38	3	1	39
Mill	12	45	2	2	38

* Airborne fibers were identified as positive amphiboles by selected area electron diffraction.

** Amphiboles differentiated by energy dispersive microchemical analysis.

*** Electron diffraction patterns not sufficient for identification; however, many had x-ray spectra identical to tremolite.

Table 11

Summary of Airborne Fiber Diameters for Positive Amphiboles
Gouverneur Talc Company, Number One Mine and Mill

Operation and Fiber Type	Median Diameter μm	Geo. Std. Deviation	95% Conf. Interval for Median Diameter μm	% $\leq 0.5 \mu\text{m}$ in Diameter
<u>Mine*</u>				
Tremolite (N=83)	0.19	2.3	0.16-0.23	88
Anthophyllite (N=164)	0.13	2.4	0.12-0.15	93
<u>Mill*</u>				
Tremolite (N=160)	0.19	2.4	0.17-0.22	87
Anthophyllite (N=687)	0.13	2.9	0.12-0.14	90

* Results of all samples combined for distribution analysis.

N = Number of individual fibers analyzed.

Table 12

Summary of Airborne Fiber Lengths for Positive Amphiboles
Gouverneur Talc Company, Number One Mine and Mill

Operation and Fiber Type	Median Length μm	Geo. Std. Deviation	95% Conf. Interval for Median Length μm	% $\leq 5 \mu\text{m}$ in Length
<u>Mine*</u>				
Tremolite (N=33)	1.6	1.8	1.4-1.8	97
Anthophyllite (N=164)	1.5	2.6	1.3-1.7	90-92
<u>Mill*</u>				
Tremolite (N=160)	1.5	1.9	1.4-1.7	97
Anthophyllite (N=687)	1.4	2.9	1.3-1.5	90

* Results of all samples combined for distribution analysis.

N = Number of individual fibers analyzed.

were seen in the mill. In the mine and mill, only 3% of the tremolite fibers were longer than 5 μ m whereas 8-10% of the anthophyllite fibers were longer than this length.

The trend for airborne anthophyllite fibers to have larger aspect ratios can be observed by inspection of Figures 2 and 3 and Table 13. Median aspect ratios of 9.5 and 7.5 were observed for anthophyllite and tremolite, respectively. Only 30% of the tremolite fibers had aspect ratios greater than 10 to 1 whereas 48% of the anthophyllite fibers had aspect ratios greater than this value.

Typical electron photomicrographs of airborne particulates from the mine and mill are shown in Figures 4,5 and 6. In addition to large amounts of analytical data already presented, the asbestiform nature of these fibers may be further appreciated by observation of their "fibril" structures.

FIGURE 2

Aspect Ratios For Airborne Anthophyllite Fibers
Number One Mine and Mill (Combined)

ASPECT RATIO (Length to Width)

CUMULATIVE % OF VALUES $\leq$ GIVEN RATIO

MEDIAN = 9.5

$\sigma_g = 2.1$

N = 852

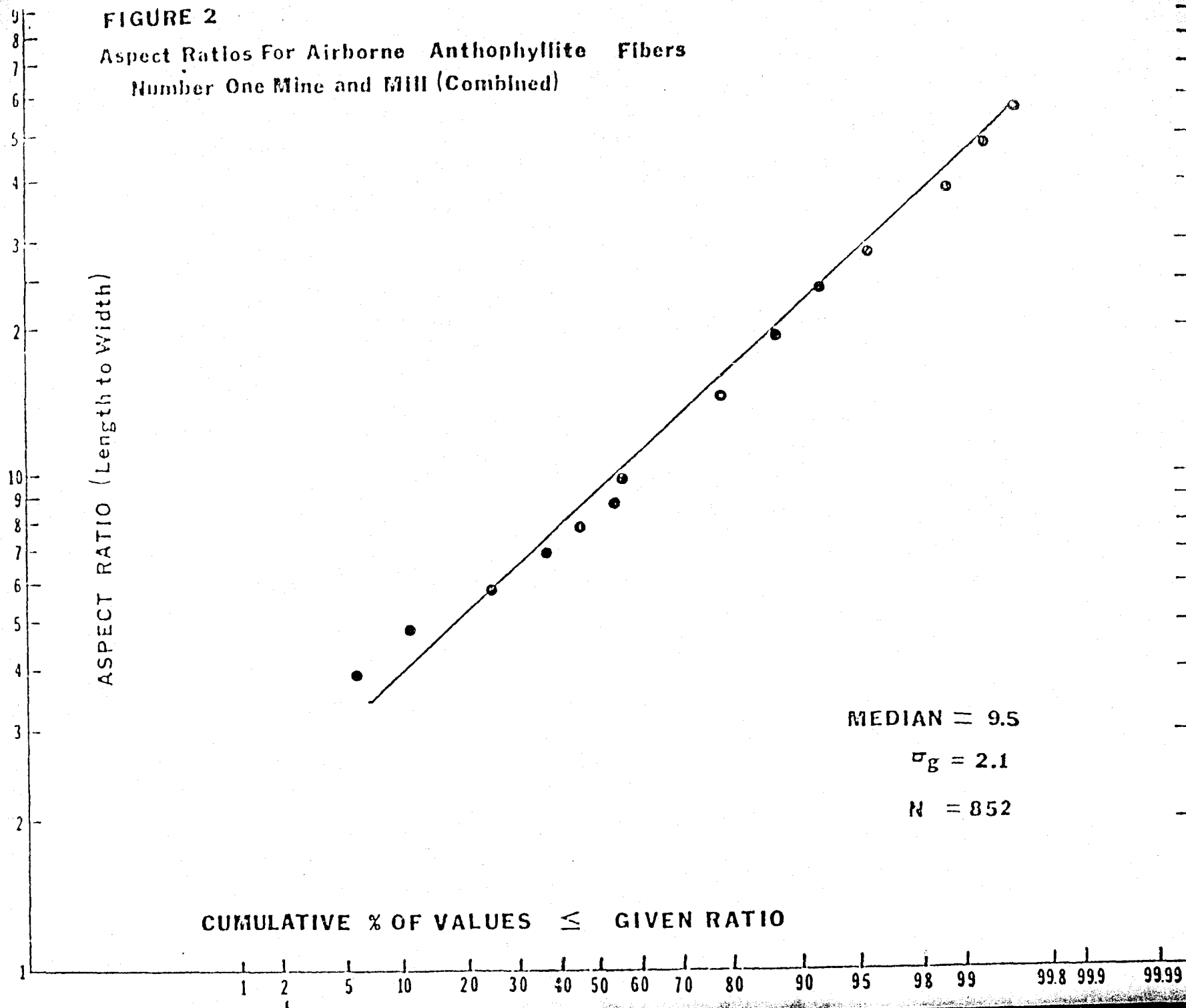


FIGURE 3
Aspect Ratios For Airborne Tremolite Fibers
Number One Mine and Mill (Combined)

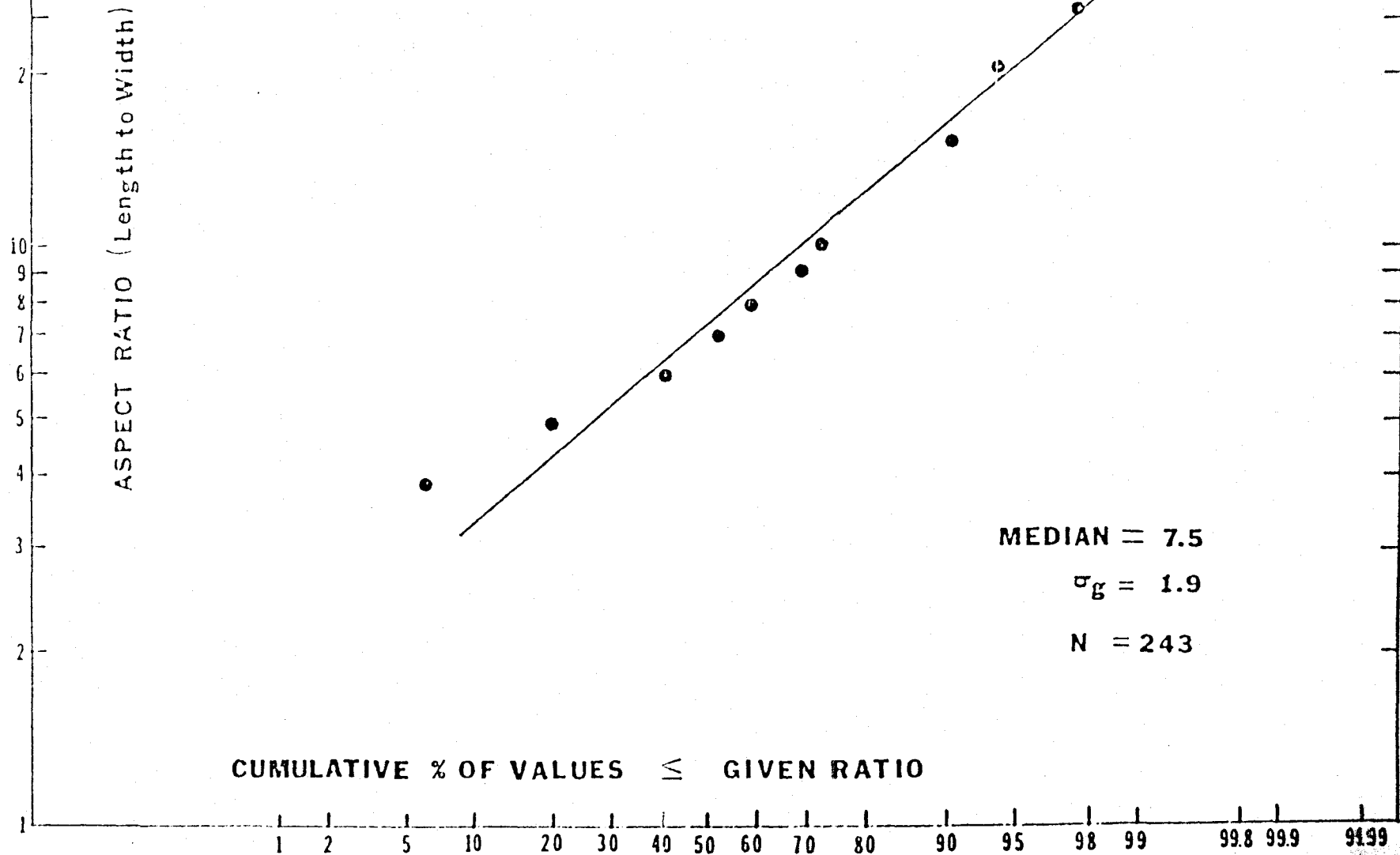
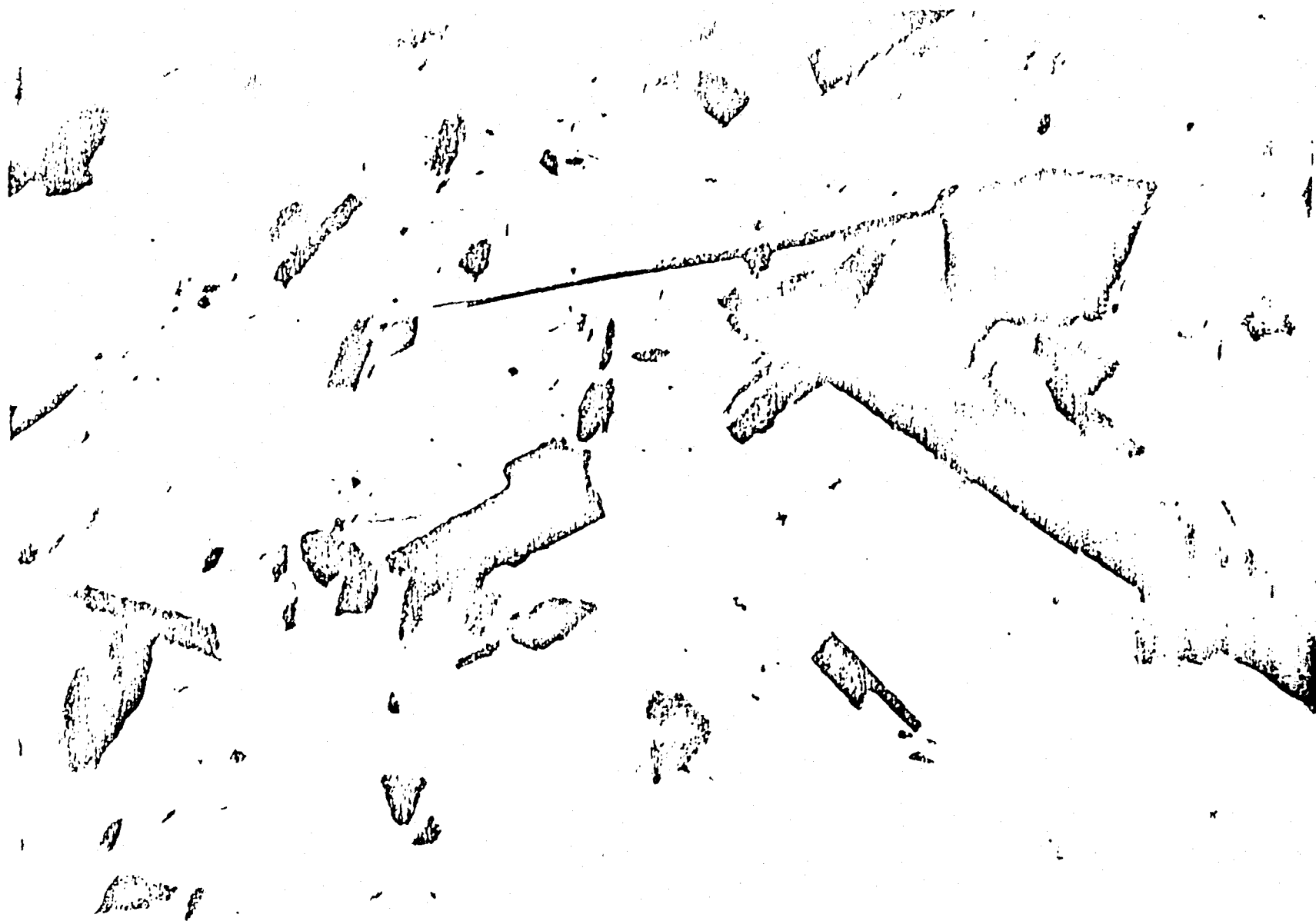


Figure. 4: Electron Photomicrograph of Airborne Particulates from number one Mill and Mine



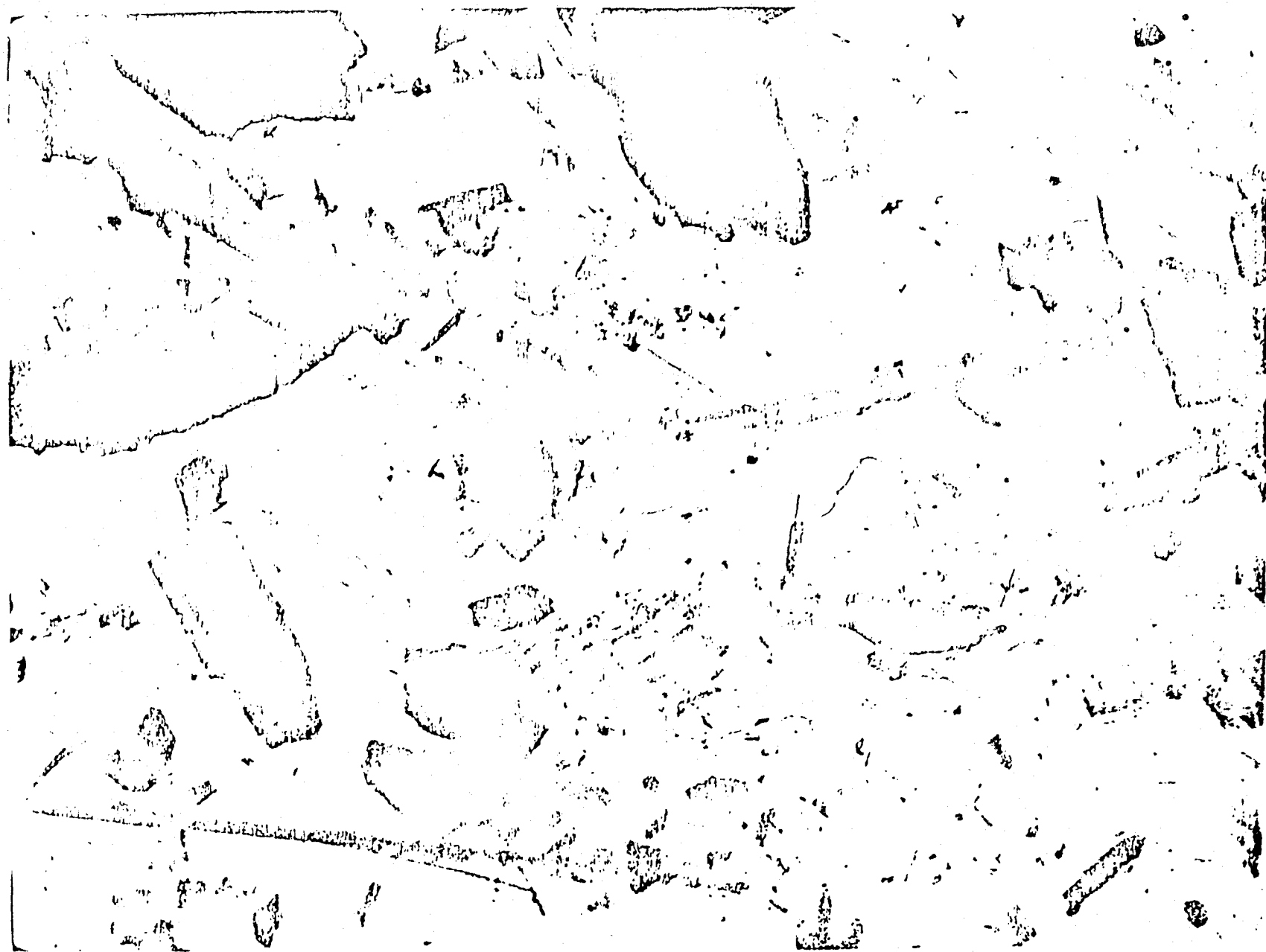
CRMCMAD-000041

Figure 5: Electron Photomicrograph of Airborne Particulates from Number one Mine and Mill



CRMCMAD-000042

Figure 6: Electron Photomicrograph of Airborne Particulates from number one Mine and Mill



CRM-MAD-000043

Table 13

Aspect Ratios for Positive Amphiboles Determined by Electron Microscopy
Gouverneur Talc Company, Number One Mine and Mill

Aspect Ratio Measurement	Tremolite*		Anthophyllite*	
	Mine	Mill	Mine	Mill
Median Aspect Ratio	7.5	7.5	9.5	9.5
Aspect Ratio				
$\leq 5/1$	23%	24%	17%	15%
$\leq 10/1$	70%	70%	52%	52%
$\leq 20/1$	96%	96%	85%	88%
$\leq 50/1$	>99%	>99%	99%	>99%

* Data shown are for all fiber lengths

COMPARISON OF SAMPLING AND ANALYTICAL METHODS

In order to compare results of the present study with historic dust measurements, several comparisons were made. Results of the stationary samples for correlation of sampling and analysis methods are shown in Table 14. Based on these limited data, the following average relationships were calculated:

Ratio	Average	Range
resp. dust, mg/m^3 / mppcf	0.22	0.12-0.29
fibers > 5 $\mu\text{m}/\text{cc}$ / resp. dust mg/m^3	6.7	3.1-11.9
fibers > 5 $\mu\text{m}/\text{cc}$ / mppcf	1.2	0.9-1.4

These data also show that an average of 28 percent of the airborne dust in the mill is respirable.

A further comparison of fiber concentrations determined by optical microscopy and respirable dust concentrations is afforded by the paired personal dust measurements made in the mill. A linear regression analysis of these time-weighted-average values is shown in Figure 7. The regression line was forced through the null points after this null hypothesis was tested⁽¹¹⁾ and could not be rejected. A good correlation ($r=0.73$) was found between these two sampling methods. The results of this analysis demonstrated the following relationship:

$$\text{fibers} > 5 \mu\text{m}/\text{cc} / \text{resp. dust, mg}/\text{m}^3 = 6.3$$

FIGURE 7

Comparison of Time Weighted Average
Fiber and Respirable Dust Exposures,
Mill Samples

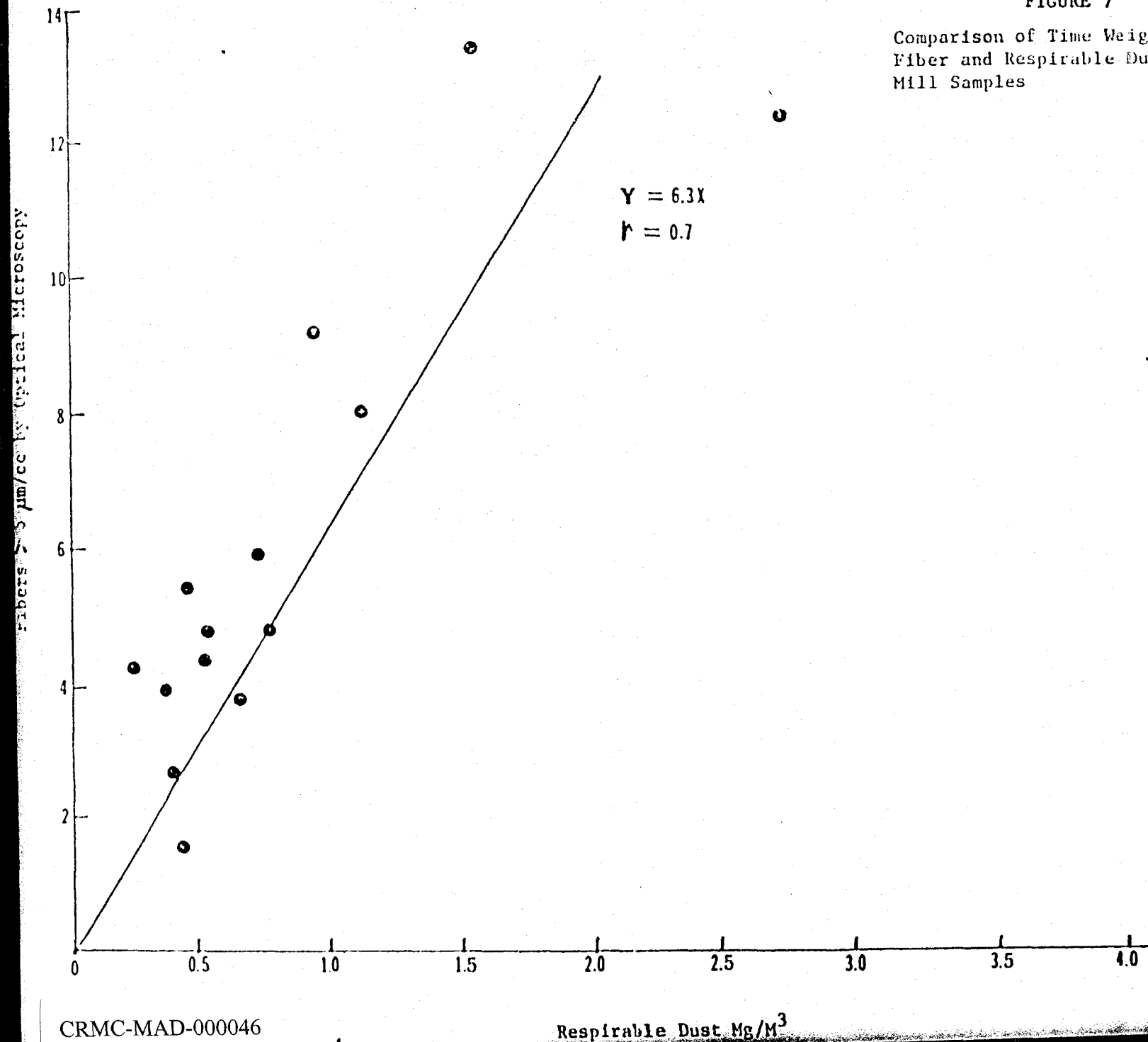


Table 14

Summary of Stationary Samples for Correlation of Sampling Methods
Gouverneur Talc Company, Number One Mill

Sample Station	Time-Weighted-Average Concentrations			
	Total Dust mg/m ³	Resp. Dust mg/m ³	Impinger mppcf	Asbestos Fibers > 5um/cc
1	2.44 (N=1)	0.88 (N=1)	3.5 (N=12)	4.4 (N=3)
2	1.47 (N=1)	0.36 (N=1)	3.0 (N=5)	4.3 (N=3)
3	8.81 (N=1)	2.14 (N=1)	7.2 (N=6)	6.7 (N=2)

N = Number of individual samples collected.

CRMC-MAD-000047

The 95% confidence interval for this ratio was calculated to be 4.1 to 8.5. . These results are consistent with those shown in Table 14 for the stationary mill samples.

A comparison was also made between time-weighted-average fiber exposures (fibers > 5 $\mu\text{m}/\text{cc}$) and impinger dust exposures (mppcf) for individuals in the mine and mill. These results are shown in Table 15. As can be seen, no consistent conversion between these sampling methods was obtained although some differences in conversion values in the mine and mill are evident. A median conversion ratio (fibers > 5 $\mu\text{m}/\text{cc}/\text{mppcf}$) of 0.5 was obtained for mine samples whereas a median ratio of 1.7 was obtained for the mill. These differences are statistically significant ($p < 0.001$). Several possible explanations exist for this difference; however, the most plausible is that fine grinding, which takes place in the mill, liberates greater numbers of "free" fibers from the host rock. In addition, finer dust particles in the mill are less efficiently collected and counted by the impinger method.

A graphical comparison between total fiber concentrations by electron microscopy and fibers > 5 μm by optical microscopy is shown in Figure 8. These data were found to be highly scattered with no consistent correlation. These data are summarized in Table 16 and show a significantly different ratio of total fibers by electron microscopy to fibers > 5 μm by optical microscopy between mine and mill samples although no single predictive values can be estimated.

Table 15

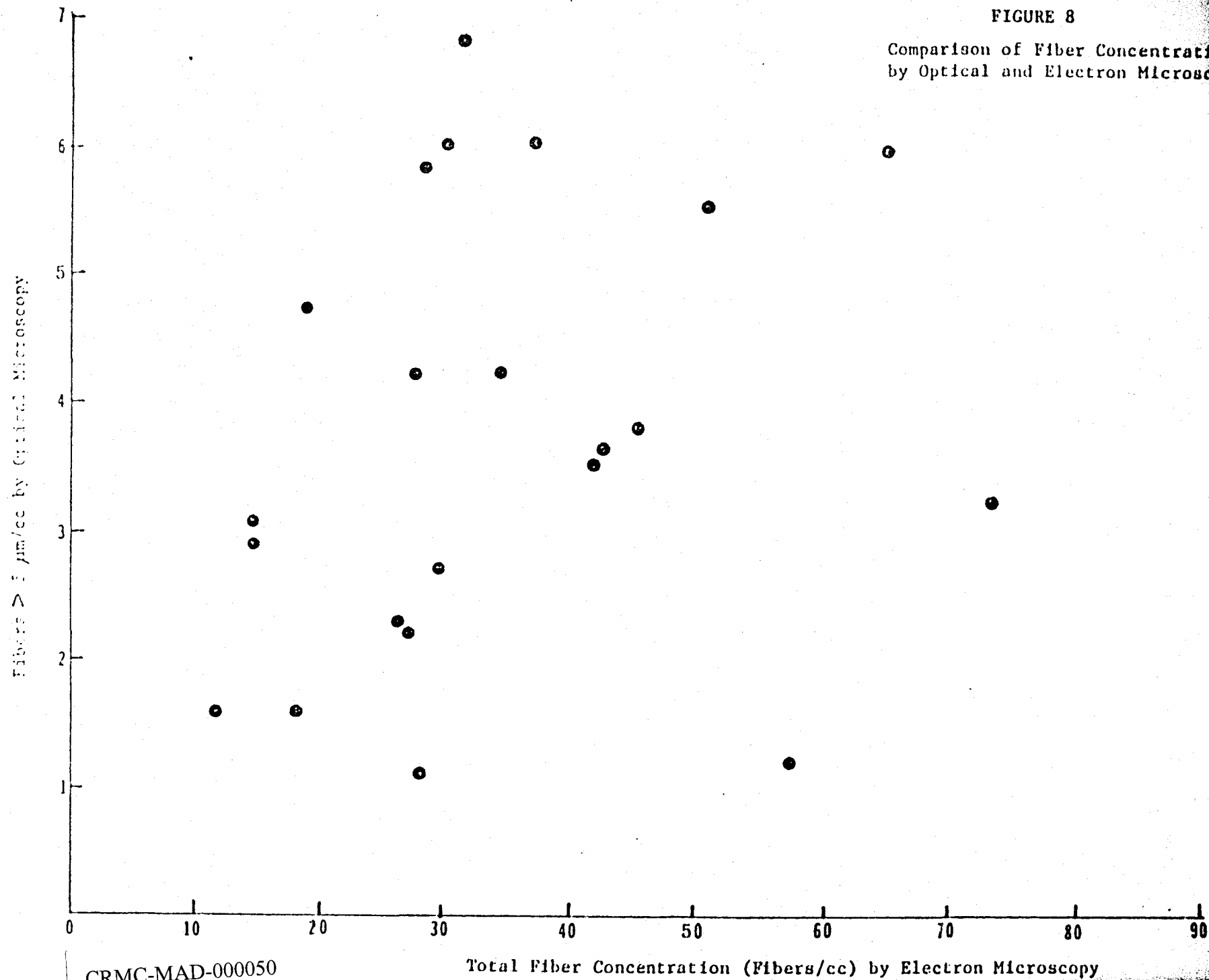
Comparison of Impinger and Optical Fiber Count Results
Gouverneur Talc Company, Number One Mine and Mill

Summary Statistic	Ratio (fibers > 5 $\mu\text{m}/\text{cc}/\text{mppcf}$)	
	Mine	Mill
Median Ratio	0.5	1.7
Range of Ratios	0.2-1.2	0.6-3.4
Number of Comparisons	6	15
95% Conf. Interval for Median Ratio*	0.3-0.8	1.3-2.2

* Based on log - normal distribution model.

FIGURE 8

Comparison of Fiber Concentrations
by Optical and Electron Microscopy



CRMC-MAD-000050

Table 16

Comparison of Optical and Electron Microscopic Fiber Concentrations
Gouverneur Talc Company, Number One Mine and Mill

Summary Statistic	Ratio (EM total fiber/cc/Opt. fiber > 5 μ m/cc	
	Mine	Mill
Median Ratio	7.1	11.0
Range of Ratios	4.1-12.0	4.7-47.9
Number of Comparisons	5	17
95% Conf. Interval* for Median Ratio	6.7-7.5	10.7-11.3

* Based on log - normal distribution model.

COMPARISON OF PRESENT AND PAST EXPOSURES

The present studies demonstrate elevated exposures to asbestiform minerals in nearly all mine and mill process operations. Comparisons between present dust (mppcf) and fiber (fibers > 5 $\mu\text{m}/\text{cc}$) exposures and historic exposure measurements are shown in Tables 17 and 18, respectively. These data were gathered from a number of sources.

Trends in dust concentrations as a function of calendar time are difficult to interpret for several reasons. First and most important is the relative paucity of data on some operations prior to approximately 1970. Secondly, very few samples were taken in any given year and the representativeness of these samples is unknown.

For visual inspection of trends in dust concentrations, average values for mine and mill operations by year were calculated and are shown in Figures 9 and 10, respectively. Inspection of Figure 9 shows no consistent trends in dust concentrations when all mine operations are considered. On the other hand, the mine exposures for such operations as drilling, dragline loading, tramming and mucking show relatively consistent exposure levels over the years with only slight deviations. This might be expected as wet drilling has been a routine practice. In addition, ores being mined are relatively wet. Primary crushing and hoist loading operations show somewhat of a decreasing trend. Such controls as water sprays for dust suppression at the primary crusher are the most probable explanation for this trend.

Table 17

Summary of Historic Impinger Dust Measurements at the
Gouverneur Talc Company, Number One Mine and Mill

Job or Operation	Mean Dust Concentration (mppcf)										Median Yearly Average
	1954	1958	1963	1964	1969	(1) 1970	(2) 1972	(2) 1973	(2) 1975	NIOSH 1975	
<u>Mine</u>											
Drilling	5		5		13	7	4	5	3	12	5
Dragline Loading			7			10	8	3	5	12	8
Tramming & Buckling					29	11	10	3	5	10-15	10
Primary Crushing	2	26	23	18	13	48	11	5	18		18
Hoist Loading				70	140	14	18	10	15	2	14
<u>Mill</u>											
Secondary Crushing	12	23	8	10	12	13	3	8	3	3	9
Wheeler Grinding	15	13	5	3	11	19		4	10	3	10
Hardinge Grind- ing	18	14	4	7		8			10	3	8
Bagging	25	15	5	9	4	8		8	9	4	8
Palletizing	40			25	10	6		8	15	2	10
Bulk Loading						10					35
Loading Bags		109	39	31		62					50
<u>Other</u>											
Millwright								4		4	
Maintenance								12		2	

(1) Values for 1954 - 1970 taken from reference 16.

(2) Calculated from MESA reports references 33-42

Table 18

Summary of Historic Fiber Exposure Measurements at the
Gouverneur Talc Company, Number One Mine and Mill

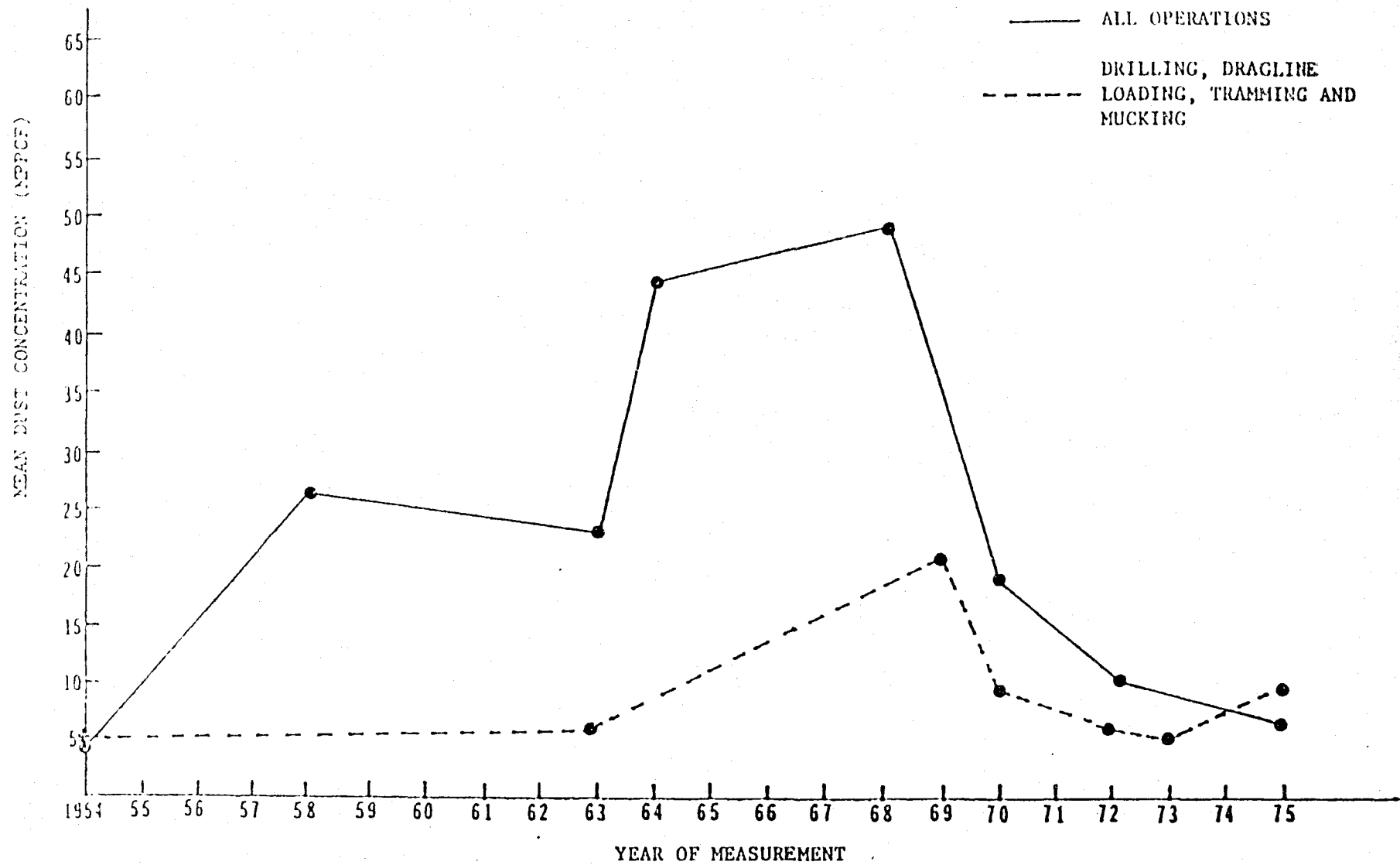
Job or Operation	Mean Fiber Concentration (fiber > 5 $\mu\text{m}/\text{cc}$)						
	(1) 1970	(2) 1972	(2) 1973	(2) 1974	(2) 1975	NIOSH 1975	(2) 1976
<u>Mine</u>							
Drilling	8	4	1	1	1	3	24
Dragline Loading	16	6	1	2		6	
Tramming & Mucking	22	6	1		3	6	8
Primary Crushing	260	22	5	9	20	10	25
Hoist Loading	29	5	10	13	3	10	12
<u>Mill</u>							
Secondary Crushing	13	5	14	6	9	5	18
Wheeler Grinding	30		14	13	17	8	14
Hardinge Grinding	33			13	10	8	14
Bagging	30		11	15	6	5	14
Palletizing	27		8	15		4	
Bulk Loading	8					2	
Loading Bags						3	
<u>Other</u>							
Millwright			9			2	
Maintenance			14			2-4	38

(1) Taken from reference 16

(2) Calculated from MESA reports, references 33-43

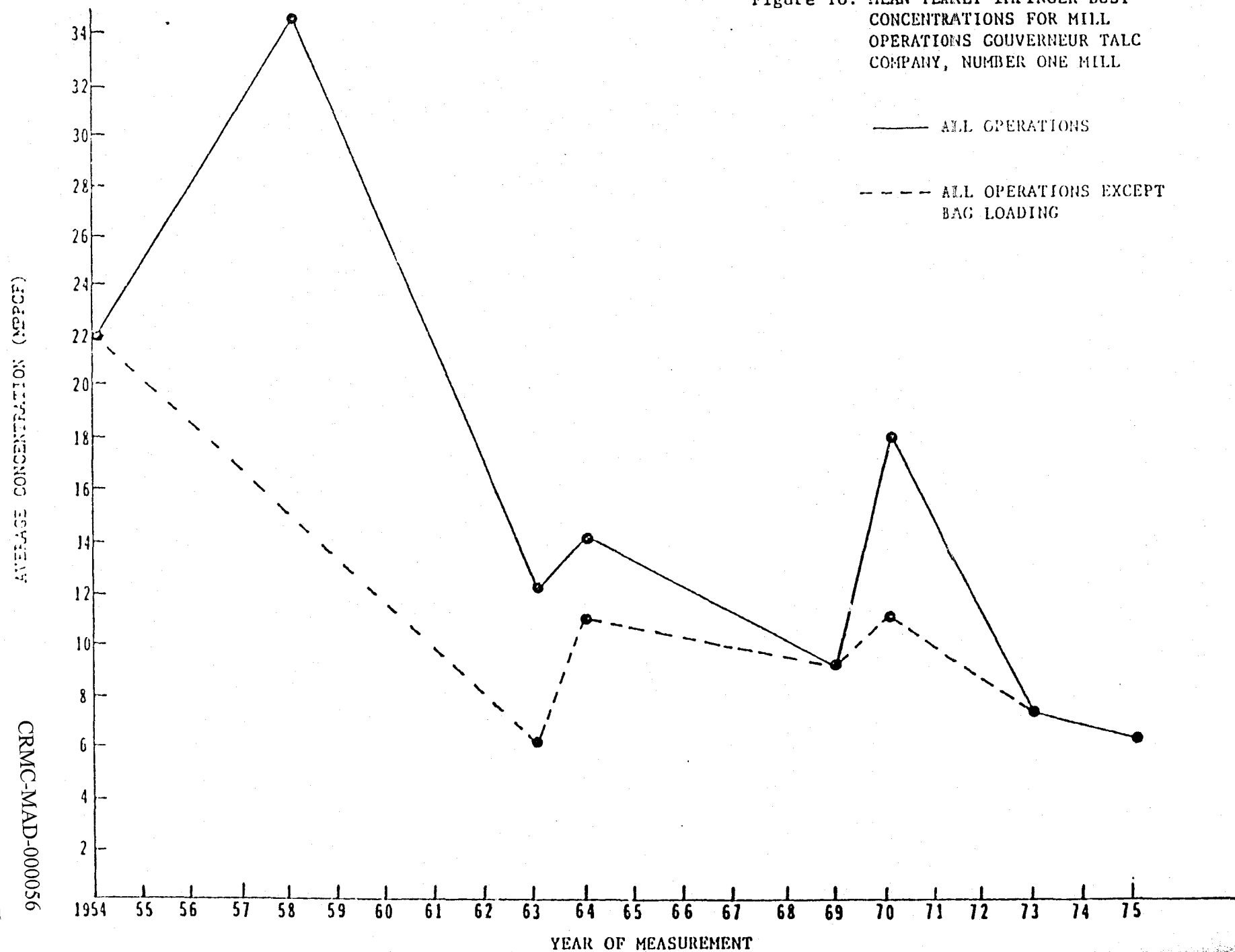
CRMC-MAD-000054

FIGURE 9: MEAN YEARLY IMPINGER DUST
CONCENTRATIONS FOR MINE
OPERATIONS, GOUVERNEUR TALC
COMPANY, NUMBER ONE MINE



CRM-MAD-000055

Figure 10: MEAN YEARLY IMPINGER DUST
CONCENTRATIONS FOR MILL
OPERATIONS COUVERNEUR TALC
COMPANY, NUMBER ONE MILL



A greater trend for decreasing dust concentrations in mill operations is demonstrated in Figure 10 for all mill operations combined. Figure 10 also shows a greater decreasing trend in exposure when the uncontrolled operation of loading bagged talc into box cars is excluded from the calculated yearly averages. Engineering controls for talc milling operations have improved with time.

As shown in Table 18, fiber exposure measurements have only been made since 1970. Results of the NIOSH 1975 survey tend to show a reduction in fiber exposure when contrasted with earlier data for most operations.

Radon daughter measurements have been made in the number one mine by the Mining Enforcement and Safety Administration (MESA). Measurements taken in 1973 and 1976 showed only nil to trace levels. (44,45)

DISCUSSION

Results of the present industrial hygiene study and past surveys demonstrate significant exposures to airborne fibers in both mine and mill operations at this facility. Electron microscopic analyses of both bulk talcs and airborne dust samples have shown that these airborne fibers are largely asbestiform tremolite and anthophyllite with airborne fibers sizes (length and diameter) consistent with those found for industrial processes using asbestos.⁽¹⁷⁾ By any reasonable mineralogical or physiological definition of "fiber", one must consider tremolite and anthophyllite fibers in these talcs to be asbestiform.

More than four decades have elapsed since the first epidemiological data were published demonstrating adverse health effects of tremolite talc exposure. In 1933, Dreessen⁽¹⁸⁾ published the results of a chest x-ray study of 57 workers engaged in the mining and milling of talcs containing up to 45% tremolite and little free silica. This study showed that all workers with greater than 10 years exposure had increased lung markings ranging from increased fibrosis to what was termed "second stage" pneumoconiosis. Among these 17 workers, no cases of active tuberculosis were observed. Dreessen stated that the observed pneumoconiosis had not led to disability.

The respiratory effects of exposures to talc containing 10% "bladed" tremolite in two Georgia talc mines and mills were reported by Dreessen and Dalla Valle in 1935.⁽¹⁹⁾ A total of 66 workers were given physical examinations and chest x-rays of which 19 were exposed for more than 10 years with only 2 having 20 or more years of exposure. Twenty two of these workers demonstrated pneumoconiosis with varying severity. Approximately half of the mill workers exposed to an average dust concentration of 300 mppcf

were diagnosed as having pneumoconiosis with 8 having frank symptoms such as dyspnea, cough, chest pain, rales, and finger clubbing. Examination of 9 former talc workers who had been separated from exposure more than 3 years demonstrated pneumoconiosis in all cases with 4 cases in advanced stages causing these authors to conclude that the lung changes were permanent.

Additional case studies of New York tremolite talc workers were reported by Porro et.al. (20) Fifteen pneumoconiosis deaths in talc workers were studied in addition to 5 autopsy studies. Thirteen of these deaths were considered to be directly attributable to the pneumoconiosis confirming the disabling character of this exposure. These authors concluded that the disabling tissue changes were due to tremolite talc exposure. Some calcifications were noted.

Siegal et.al. (21,22) reported a study of roentgenological findings among New York talc workers in addition to an assessment of their exposures. These talcs were described as containing fibrous tremolite and anthophyllite and less than 1% free SiO_2 . A total of 221 talc workers in three mines and five mills were given chest x-ray examinations. Of the 221 men examined, 32 showed marked fibrosis. Those workers with 10 or more years employment demonstrated an incidence of fibrosis of 29.9% whereas those employed for more than 30 years had a fibrosis incidence of 74%. This fibrosis was described as disabling and often accompanied by dyspnea, cough and fatigue. "Talc plaques" were identified in 6.3% of the workers examined. These authors described the fibrosis observed as resembling that seen among asbestos workers.

The 32 cases of pneumoconiosis identified by Siegal et.al.^(21,22) were followed prospectively by Kleinfeld et.al.⁽²³⁾ In the 14 year period after the Siegal study, 19 of the 32 workers died with the ages at death ranging from 48 to 84 years. Four of these 19 deaths were believed to be directly attributable to talc pneumoconiosis. One death due to pleural mesothelioma was reported. Medical examinations of the 13 living workers were performed including a physical examination, chest x-ray, EKG and peripheral blood studies (Hgb, RBC, WBC, Diff Count). Dyspnea was found in all workers of such severity as to limit ordinary physical activity. Moderate to severe progression of lung x-ray findings were seen in 10 of these workers and "talc plaques" were seen in all but one worker. Six out of 11 demonstrated an abnormal electrocardiogram. Peripheral blood findings were not considered of significance. These authors also reported the presence of "asbestos bodies" histologically. Similar findings were reported in a latter study of six pneumoconiosis with autopsy studies.⁽²⁵⁾

A comparative clinical and environmental study of workers exposed to fibrous and non-fibrous talcs in New York State was reported by Messite et.al.⁽²⁴⁾ Three talc operations in St. Lawrence County (fibrous) and one operation in Lewis County (non-fibrous) were selected for study and a total of 299 workers were given physical examinations and chest x-rays. Among miners, the incidence of pulmonary fibrosis was low for both the St. Lawrence and Lewis County cohorts; however, the mean duration of exposure was only 12.7 and 10.3 years, respectively. Among millers, the incidence of fibrosis was 12.2% and 4.3% respectively for the St. Lawrence and Lewis cohorts. Exposure levels in the plants were described as being similar with all talcs

having a low free silica content. These authors concluded that both types of talc were capable of producing pulmonary fibrosis although the tremolite (fibrous) variety was more pathogenic. In addition, these investigators stated that no cases of fibrosis was found in millers of either talc variety whose average exposure was less than 20 mppcf or whose duration of exposure was less than 10 years.

In a follow-up study, Kleinfeld et.al.⁽²⁸⁾ made additional comparisons, including lung function, between the St. Lawrence and Lewis County New York cohorts described above. Thirty workers exposed to fibrous and 13 exposed to non-fibrous talcs were given chest x-rays and pulmonary function tests. Dyspnea was present in 16 of 30 workers in the fibrous talc exposed group and 6 of 13 in the non-fibrous talc exposed group. Abnormal auscultatory findings (rales, rhonchi, wheezing) were found in 8 of the 30 workers and 6 of 13 workers exposed to fibrous and non-fibrous talc, respectively. The incidence of pulmonary infiltration as seen in chest films was 13 of 30 for the fibrous group and 3 of 13 for the non-fibrous group. Both groups showed pulmonary function changes with 4 of 13 workers in the group exposed to non-fibrous talc and 14 of 30 workers in the group exposed to fibrous talc showing significantly reduced vital capacity. Exposures to both groups were considerably in excess of 20 mppcf.

Several additional studies of lung function have been conducted among talc workers in New York State.^(26,27,29) Kleinfeld et.al.⁽²⁶⁾ studied the lung function of sixteen tremolite talc workers who ranged from 39 to 69 years of age (mean age 54.8 years). All had been exposed to talc dust in milling operations for 10 or more years and had no previous occupational dust

exposures. The clinical examinations showed 14 of the 16 workers studied to have dyspnea on exertion, 10 had rales or wheezing and clubbing of the fingers was found in 6 workers. Increased lung pulmonary infiltration was noted in the chest x-rays of all workers studied and cardiac enlargement was noted in 5 of these 16 workers. The lung function studies showed 7 of 16 to have reduced vital capacities and one worker was found to have a lung function consistent with restrictive lung disease. The mean duration of exposure for these 16 workers was 20.4 years and the mean weighted average exposure was 68.9 mppcf. Thirteen of the 16 workers studied gave a positive smoking history (30 cigarettes per day for a minimum of 5 years).

In a subsequent study Kleinfeld⁽²⁷⁾ performed similar studies as those described above among a group of 43 tremolite talc workers and 41 controls of similar age and smoking history. In the talc cohort, 29 had dyspnea versus only 2 in the control population. Eleven talc workers gave a history of chronic cough and none in the controls and 8 talc workers showed finger clubbing whereas no clubbing was noted among controls. Sixteen of 43 talc workers had positive x-ray findings of pulmonary infiltration and none in controls and, in addition, reduced vital capacity was found in 13 talc workers and one control. These talc workers had a mean exposure duration of 19 years and a weighted average exposure of 62.3 mppcf.

A study of chest x-ray findings and clinical symptoms among miners and millers at the Gouverneur Talc Company, number one mine and mill has been reported by Kleinfeld et.al.⁽¹⁶⁾ Thirty nine workers with a mean exposure of 16.2 years (range 11-22 years) were studied in addition to 41 controls who lived

in the same geographic area and who were of the same sex and mean age but having no occupational dust exposure. Dyspnea was present in 23.1% of the talc workers versus 7.3% for controls, a finding similar to that seen in anthophyllite asbestos workers.⁽³³⁾ One worker studied was said to have radiologic findings compatible with pneumoconiosis whereas no cases were found among controls. These authors suggested that talc containing tremolite and anthophyllite may be less fibrogenic than chrysotile or amosite asbestos at similar exposure levels and exposure duration; however, these authors did not preclude the possible existence of pneumoconiosis among these workers as no lung function studies were conducted.

Although the above studies have demonstrated the presence of pneumoconiosis among tremolite talc miners in New York, these study designs were insensitive for detection of carcinogenic risks. However, two retrospective proportional mortality studies have demonstrated an increased risk of cancer of the lung and pleura among these workers.^(2,3) The initial study by Kleinfeld et.al.⁽³⁾ included 220 talc miners and millers employed in 1940 who had 15 or more years of exposure to talc dust in addition to those who achieved a minimum of 15 years of exposure between 1940 and 1965. Among this cohort there were 91 deaths of which 10 (11%) were due to malignancies of the lung or pleura whereas only 2.9 (3.2%) were expected. In addition, 28 deaths were due to pneumoconiosis or its complications. One of the respiratory cancers was a fibrosarcoma of the pleura.

In a subsequent follow-up study, Kleinfeld et.al.⁽²⁾ extended the observation of the previous cohort from 1960 to 1969. This cohort consisted of 260 workers.

among which there were 108 deaths. Thirteen of these deaths (12%) were due to respiratory cancer whereas only 4 (3.7%) were expected. Twenty nine deaths were due to pneumoconiosis or its complications. These authors analyzed mortality patterns by 5 year intervals between 1940 and 1969 and concluded that the respiratory cancer risk approached expected values after the period 1960-64. The validity of this conclusion must be questioned as an analysis of mortality in relation to cancer latency was not undertaken. In addition, the limitations of proportional mortality studies in the presence of an elevated pneumoconiosis risk are now well known.

An excess cancer risk has been demonstrated among workers exposed to anthophyllite asbestos. (30,31,32) Kiviluoto and Meurman⁽³⁰⁾ studied 1,092 anthophyllite asbestos workers who had worked for more than 3 months between 1936 and 1967 and compared cause specific mortality with rates for Finland. In addition, chest x-rays were read for 252 living workers. Twenty one lung cancers were observed whereas only 12 were expected which was statistically significant. Thirteen of these lung cancer victims had been exposed less than 10 years and only one of these cases was known to have asbestosis. No pleural or peritoneal mesotheliomas were observed.

Nurminen⁽³¹⁾ has also reported on the mortality experience of anthophyllite asbestos workers in Finland. This study included 1030 workers who had been employed for three months or more from 1936 to 1966 and followed until 1968. Expected cause specific deaths were calculated using Finland national rates for 1951-1964. There were 224 deaths in this cohort whereas 204 were expected with a mean age at death of 53.4 years. Twenty five deaths (12%)

had asbestosis as an underlying cause and, in addition, there was a highly significant excess risk of respiratory cancer (13 obs. versus 6 exp., $p < 0.01$). No mesotheliomas were detected. The mean latency between first exposure and death due to asbestosis was 19 years.

One of the most comprehensive studies of mortality and morbidity among anthophyllite asbestos workers was reported by Meurman et.al. (32) A cohort of 1092 workers who had worked at least 3 months between January 1936 and June 1967 was obtained from two mining operations; one of which produced anthophyllite asbestos and the other produced mainly tremolite talc. For calculation of expected age, cause specific deaths, proportional rates for Finland were used for 1958 which was the median year of death for these workers. In addition, a control group matched for date of birth and sex was chosen from a local population registry.

Of the 1092 employees, 248 deaths were observed. Thirteen deaths due to asbestosis were observed for the cohort and none in the controls. Twenty one lung cancers were observed in the worker cohort versus 13 in the control group. The most significant cancer risk was observed in those with ten or more years of exposure. These authors adjusted lung cancer rates for smoking habits and concluded that a non-smoking asbestos worker had a relative risk of 1.4 whereas the smoking asbestos worker had a relative risk of 17.0. No cases of mesothelioma were reported.

All of the above epidemiological studies of workers exposed to fibrous tremolite or anthophyllite have demonstrated an excess risk of both pneumoconiosis and lung and pleural cancer. No evidence of an excessive risk of mesothelioma

among such exposed workers has yet been demonstrated; however, an excessive incidence of pleural changes including pleural calcifications have been observed in chest films.

CRMC-MAD-000066

CONCLUSIONS AND RECOMMENDATIONS

Results of the present industrial hygiene study show numerous operations in both the number one mine and mill to have excessive exposures to airborne fibers. Analyses of both bulk talcs samples and airborne dust samples by analytical electron microscopy have shown that a majority of these fibers are asbestiform tremolite and anthophyllite. Based on these studies and on exhaustive review of the epidemiological literature concerning health effects of such exposures, it is concluded that immediate corrective actions to reduce exposures must be taken as recommended in the Progress Report issued on May 25, 1976. Specific actions include the following:

1. Mine ventilation should be evaluated with considerations for increasing air volume and distribution. Water sprays should be installed at the ore pockets.
2. During the present study, numerous leaks were observed at material transfer points within the mill. More emphasis should be placed on maintaining equipment in proper working order.
3. At the packing stations, ventilation improvements are needed. Local exhaust hoods at these machines are located too far from the filling spout to be effective. Hood designs at these machines should be further evaluated. In addition, bursting bags at these stations are a significant source of exposure; therefore, use of bags with a greater bursting strength should be considered.
4. Until ventilation and work practice improvements are made and asbestos fiber exposures reduced to acceptable levels, employees should be provided with respiratory protection as specified in the OSHA asbestos standard. (8)

CRMC-MAD-000067

5. All provisions for medical examinations specified in the OSHA asbestos standard⁽⁸⁾ should be followed.

The asbestiform mineral content of products from the number one mine and mill make it imperative that these talcs be labeled with the OSHA warning label.⁽⁸⁾

REFERENCES

1. Ross, M. Geology, Asbestos, and Health. Environment Health Perspect. 9: 123-124, 1974
2. Kleinfeld, M., Messite, J. and Zaki, H. Mortality Experiences Among Talc Workers: A Follow-up study. Journal of Occupational Med. 16, No. 5: 345-349, 1974.
3. Kleinfeld, M., Messite, J. and Kooyman, O. Mortality Among Talc Miners and Millers in New York State. Industrial Hygiene Review, New York Department of Labor. 9: 3-12, 1967.
4. Peter J. Bernnan versus Borg Warner Corporation, Plumbing Products Division. CSAHRC Docket No. 10757, Richland County Administration Building, Mansfield, Ohio. Complaints Exhibit No. 19, April 2, 1975.
5. Criteria for a Recommended Standard: Occupational Exposure to Crystalline Silica. U.S. DHEW, CDC, National Institute for Occupational Safety and Health, 1974.
6. Criteria for a Recommended Standard: Occupational Exposure to Asbestos. U.S. DHEW, CDC, National Institute for Occupational Safety and Health, 1972.
7. Gillam, J.D., Dement, J.M., Lemen, R.A., Wagoner, J.K. and Archer, V.E. Mortality Patterns Among Hard Rock Miners Exposed to an Asbestiform Mineral. Ann. N.Y. Acad. Sc. 271: 336-344, 1976.
8. U.S. Department of Labor, Occupational Safety and Health Administration. Occupational Safety and Health Standards. Federal Register 39: Number 125, June 27, 1974 as recoded, May 28, 1975.
9. Ortiz, L.W. and Isom, B.L.: Transfer Technique for Electron Microscopy of Membrane Filter Samples. Amer. Ind. Hyg. Assoc. J.: 423-425, 1974.
10. Rohl, A.N., Langer, A.M., Selikoff, I.J., Tordini, A., Klimentidis, R., Bowes, D.R. and Skinner, D.L. Consumer Talcums and Powders: Mineral and Chemical Characterization. Jour. Tox and Env. Hlth. 2: 225-294, 1976.
11. Snedecor, G.W. and Cochran, W.G.: Statistical Methods. The Iowa State University Press. 6th Ed., 1967.
12. U.S. Department of Labor, Occupational Safety and Health Administration. Notice of Proposed Rulemaking, Occupational Exposure to Asbestos. Federal Register, October, 1975. Docket No. II-033.

REFERENCES

13. Pask, J.A. and Warner, M.F.: Fundamental Studies of Talc I. Constitution of Talcs. Journ. of the Amer. Ceramic Society 37 No. 3: 118-128, March 1954.
14. Ross, M., Smith, W.L. and Ashton, W.H.: Triclinic Talc and Associated Amphiboles from the Gouverneur Mining District, New York Amer. Mineralogist 53: 751-769, May-June, 1968.
15. Stemple, I.S. and Brindley, G.W.: A Structural Study of Talc and Talc-Tremolite Relations. Journ. of the Amer. Ceramic Society 43 No. 1: 34-42, January, 1960.
16. Kleinfeld, M., Messite, J. and Langer, A.M.: A Study of Workers Exposed to Asbestiform Minerals in Commerical Talc Manufacture. Env. Research 6: 132-143, 1973.
17. Lynch, J.R., Ayer, H.E. and Johnson, D.L.: The Interrelationships of Selected Asbestos Exposure Indices. Amer. Ind. Hyg. Assoc. Journal 31: Sept.-Oct., 1970.
18. Dreessen, W.C.: Effects of Certain Silicate Dusts on the Lungs. Jour. Ind. Hyg. 15 No. 2: 66-78, March, 1933.
19. Dreessen, W.C. and Dalla Valle, J.M.: The Effects of Exposure to Dust in Two Georgia Talc Mills and Mines. Public Health Reports 50 No. 5: 131-141, 1935.
20. Porro, F.W., Patton, J.R. and Hobbs, A.A.: Pneumoconiosis in the Talc Industry. Amer. Journ. of Roentgenology and Radium Therapy 47 No. 4: 507-524, 1942.
21. Siegal, W., Smith, A.R. and Greenburg, L.: The Dust Hazard in Tremolite Mining, Including Roentgenological Findings in Talc Workers. Amer. Journ. of Roentgenology and Radium Therapy XLIX: 11-29, 1943.
22. Siegal, W., Smith, A.R. and Greenburg, L.: Study of Talc Miners and Millers. Industrial Bull. 22: 3-12, 1943.
23. Kleinfeld, M., Messite, J. and Tabershaw, I.: Talc Pneumoconiosis. A.M.A. Archives of Ind. HLTH 12: 66-72, 1955.
24. Messite, J., Reddin, G. and Kleinfeld, M.: Pulmonary Talcosis, A Clinical and Environmental Study A.M.A. Archives of Ind. Health 20: 408-413, 1959.
25. Kleinfeld, M., Giel, C.P., Majeraonowski, J.F. and Messite, J.: Talc Pneumoconiosis: A report of Six Patients with Post Mortem Findings. Ind. Hyg. Review 6: 5-29, 1964.

REFERENCES

26. Kleinfeld, M., Messite, J., Kooyman, O. and Shapiro, J.: Pulmonary Ventilatory Function in Talcosis of Lung. Ind. Hyg. Review 7: 14-23, 1965.
27. Kleinfeld, M., Messite, J., Shapiro, J. and Swencicki, R.: Effect of Talc Dust Inhalation on Lung Function. Ind. Hyg. Review 7: 25-36, 1965.
28. Kleinfeld, M.J., Messite, J. Shapiro, J., Kooyman, O. and Swencicki, R.: Lung Function in Talc Workers: A Comparative Physiologic Study of Workers Exposed to Fibrous and Granular Talc Dusts. Ind. Hyg. Review 7 No. 1: 3-13, 1965.
29. Kleinfeld, M., Messite, J., Shapiro, J., Swencicki, R. and Sarfaly, J.: Lung Function Changes in Talc Pneumoconiosis. Journ. of Occup. Med. 7 No. 1: 12-17, 1965.
30. Kiviluoto, R. and Meurman, L.: Results of Asbestos Exposure in Finland. In: International Conference on Pneumoconiosis. Johannesburg: 107-108, 1969.
31. Nurminen, M.: A Study of the Mortality of Workers in an Anthophyllite Asbestos Factory in Finland. Work Env. Health 9: 112-118, 1962.
32. Meurman, L.O., Kiviluoto, R. and Hakama, M.: Mortality and Morbidity Among the Working Population of Anthophyllite Asbestos Mines in Finland. Brit. Journ. of Ind. Med. 31: 105-112, 1974.
33. New York Department of Labor and Industry, Division of Ind. Hyg.: Report of Field Investigation, Gouverneur Talc Co., Balmat Mine, July 23, 1972.
34. New York Department of Labor and Industry, Division of Ind. Hyg.: Report of Field Investigation, Gouverneur Talc Co., Balmat Mill, August 10, 1972.
35. New York Department of Labor and Industry, Division of Ind. Hyg.: Report of Field Investigation, Gouverneur Talc Co., Balmat Mine Sec. Crusher, July 11, 1972.
36. New York Department of Labor and Industry, Division of Ind. Hyg.: Report of Field Investigation, Gouverneur Talc Co., Balmat Mine, June 20, 1973.
37. New York Department of Labor and Industry, Division of Ind. Hyg.: Report of Field Investigation, Gouverneur Talc Co., Balmat Mill, November 20, 1973.

REFERENCES

38. U.S. Department of Interior, Mining Enforcement and Safety Administration: Dust Survey of the American Talc Mill, Gouverneur Talc Co., Balmat, N.Y., Sept. 19-20, 1973.
39. New York Department of Labor and Industry, Division of Ind. Hyg.: Report of Field Investigation, Gouverneur Talc Co., Balmat Mill, July 18, 1974.
40. U.S. Department of Interior, Mining Enforcement and Safety Administration: Memorandum to Lewis Roberts, Evaluation of Airborne Dust Samples, Gouverneur Talc Co., St. Lawrence County, N.Y., Oct. 22, 1974.
41. New York Department of Labor and Industry, Division of Ind. Hyg.: Report of Field Investigation, Gouverneur Talc Co., Balmat Mine, July 18, 1974.
42. U.S. Department of Interior, Mining Enforcement and Safety Administration: Memorandum dated September 23, 1976, Gouverneur Talc Co., Inc, Samples, Denver Technical Support Center File HLS 3-1-6h.
43. U.S. Department of Interior, Mining Enforcement and Safety Administration: Memorandum dated February 10, 1977, Fiber Counts for Gouverneur Talc, No. 1 Mine/No. 1 Mill, Balmat, New York, Denver Technical Support Center File HLS 3-1-6, HLS5.
44. U.S. Department of Interior, Bureau of Mines Health and Safety Activity: Health and Safety Report, Health and Safety Spot Inspection (Radiation), American Mine, Gouverneur Talc Co., Inc., Balmat, St. Lawrence County, N.Y., February 28, 1973.
45. U.S. Department of Interior, Mining Enforcement and Safety Administration: Health and Radiation Inspection Report, Gouverneur Talc Co., Mine No. 1 and Mill, Balmat, N.Y., March 24, 1976.

CRMC-MAD-000072

APPENDIX I

Mineral Product Safety Data Sheets
For R.T. Vanderbilt Products
(Supplied by R.T. Vanderbilt)

NOTE: Exposure to all airborne mineral dusts is subject to OSHA regulations in accordance with Section 1910.93 of the Occupational Health and Safety Administration Standard as published in the Federal Register of October 18, 1972, starting on page 22139.

SECTION I

TRACE NAME AND SYNONYMS	Π FIBER No. 1, Π Fiber 6N	Industrial Fibrous Talc
MINERAL FAMILY	Hydrous silicates	
CHEMICAL COMPOSITION	Complex hydrous calcium magnesium silicates	

SECTION II INGREDIENTS

MATERIAL	% RANGE
Asbestiform talc and/or asbestiform anthophyllite	20 - 40
Talc - non-asbestiform	5 - 15
Non-asbestiform tremolite and/or anthophyllite	40 - 60
Quartz	1 - 5
Serpentine	10 - 20

SECTION III PHYSICAL DATA

COLOR	White	SPECIFIC GRAVITY (H ₂ O = 1)	±2.7
APPEARANCE	Fibrous		
OTHER PROPERTIES			

SECTION IV HEALTH HAZARD DATA

MATERIAL	* TLV
Asbestiform talc and asbestiform anthophyllite	5 fibers/cc > 5µm. in length
Talc - non-asbestiform	20 Mocc/f
Non-asbestiform tremolite and anthophyllite	20 Mocc/f
Serpentine	50 Mocc/f
Quartz	30 mg./cu.m. ÷ % Quartz + 2

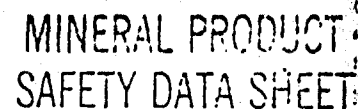
SECTION V SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Avoid breathing dust. Use respirator if TLV's exceeded.

CRMC-MAD-000074

DATE: May 1, 1975

OVER FOR FURTHER INFORMATION



SECTION I

Industrial Fibrous Talc

MINERAL FAMILY Hydrous silicates

CHEMICAL COMPOSITION Complex hydrous calcium magnesium silicates

SECTION II INGREDIENTS

MATERIAL

% RANGE

~~Asbestiform talc and/or asbestiform anthophyllite~~

40 - 60

Talc - non-asbestiform

5 - 15

Non-asbestiform tremolite and/or anthophyllite

30 - 60

Quartz

1 - 5

Serpentine

5 - 10

SECTION III PHYSICAL DATA

COLOR

White

SPECIFIC GRAVITY (H₂O = 1)

 ± 2.7

APPEARANCE

Fibrous

OTHER PROPERTIES

SECTION IV HEALTH HAZARD DATA

MATERIAL

* 227

Asbestiform talc and asbestiform anthophyllite

5 fibers/cc > 5 μ m. in length

Talc - non-asbestiform

20 Мое:

Non-asbestiform

20 МРС:

Serpentine

50 Manuf

Quartz

$$30 \text{ mg./cu.m.} \div \% \text{ Quartz} = 2$$

SECTION V SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid breathing dust. Use respirator if TLV's exceeded.

CRMC-MAD-000075



REINTEGRITY CORPORATION

MINERAL PRODUCT SAFETY DATA SHEET

NOTE: Exposure to all airborne mineral dusts is subject to OSHA regulations in accordance with Section 1910.93 of the Occupational Health and Safety Administration Standard as published in the Federal Register of October 18, 1972, starting on page 22139

SECTION I

TRADE NAME AND SYNONYMS	NYTAL 99, NYTAL 100, NYTAL 100HR	Industrial Talc
MINERAL FAMILY	Hydrous silicates	
CHEMICAL COMPOSITION	Complex hydrous calcium magnesium silicates	

SECTION II INGREDIENTS

MATERIAL	% RANGE
Talc	20 - 30
Non-asbestiform tremolite and/or anthophyllite	50 - 70
Serpentine	20 - 30
Quartz	1 - 5

SECTION III PHYSICAL DATA

COLOR	White	SPECIFIC GRAVITY (H ₂ O = 1)	±2.8
APPEARANCE	Powder		
OTHER PROPERTIES			

SECTION IV HEALTH HAZARD DATA

MATERIAL	*TLV
Talc	20 Mppcf
Non-asbestiform tremolite and anthophyllite	20 Mppcf
Serpentine	50 Mppcf
Quartz	30 mg./cu.m. ÷ % Quartz + 2

SECTION V SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Avoid breathing dust. Use respirator if TLV's exceeded.

CRMC-MAD-000076

MINERAL PRODUCT SAFETY DATA SHEET

NOTE: Exposure to all airborne mineral dusts is subject to OSHA regulations in accordance with Section 1910.93 of the Occupational Health and Safety Administration. Standard is published in the Federal Register of October 18, 1972, starting on page 22139.

SECTION I

TRADE NAME AND SYNONYMS	NYTAL 200, NYTAL 300, NYTAL 400	Industrial Talc
MINERAL FAMILY	Hydrous silicates	
CHEMICAL COMPOSITION	Complex hydrous calcium magnesium silicates	

SECTION II INGREDIENTS

MATERIAL	% RANGE
Talc	20 - 40
Non-asbestiform tremolite and/or anthophyllite	40 - 60
Serpentine	20 - 30
Quartz	1 - 5

SECTION III PHYSICAL DATA

COLOR	White	SPECIFIC GRAVITY (H ₂ O = 1)	±2.8
APPEARANCE	Powder		
OTHER PROPERTIES			

SECTION IV HEALTH HAZARD DATA

MATERIAL	*TLV
Talc	20 Mppcf
Non-asbestiform tremolite and anthophyllite	20 Mppcf
Serpentine	50 Mppcf
Quartz	30 mg./cu.m. ÷ % Quartz + 2

SECTION V SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Avoid breathing dust. Use respirator if TLV's exceeded.
CRMC-MAD-000077

MINERAL PRODUCT SAFETY DATA SHEET

NOTE: Exposure to all airborne mineral dusts is subject to OSHA regulations in accordance with Section 1910.93 of the Occupational Health and Safety Administration Standard as published in the Federal Register of October 19, 1972, starting on page 22139.

SECTION I

TRADE NAME AND SYNONYMS	CERAMIT-ALC 10AC, CERAMIT-ALC HDT	Industrial Talc
MINERAL FAMILY	Hydrous silicates	
CHEMICAL COMPOSITION	Complex hydrous calcium magnesium silicates	

SECTION II INGREDIENTS

MATERIAL	% RANGE
Talc	20 - 30
Non-asbestiform tremolite and/or anthophyllite	50 - 70
Serpentine	20 - 30
Quartz	1 - 5

SECTION III PHYSICAL DATA

COLOR	White	SPECIFIC GRAVITY (H ₂ O = 1)	±2.8
APPEARANCE	Powder		
OTHER PROPERTIES			

SECTION IV HEALTH HAZARD DATA

MATERIAL	* TLV
Talc	20 Mppcf
Non-asbestiform tremolite and anthophyllite	20 Mppcf
Serpentine	50 Mppcf
Quartz	30 mg./cu.m. ÷ % Quartz + 2

SECTION V SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Avoid breathing dust. Use respirator if TLV's exceeded.
CRMC-MAD-000078

DATE: May 1, 1975

OVER FOR FURTHER INFORMATION

MINERAL PRODUCT SAFETY DATA SHEET

NOTE: Exposure to all airborne mineral dusts is subject to OSHA regulations in accordance with Section 1910.93 of the Occupational Health and Safety Administration Standard as published in the Federal Register of October 18, 1972, starting on page 22139.

SECTION I

TRADE NAME AND SYNONYMS	CERAMITALC No. 1, CERAMITALC 10-A, IT 3X	Industrial Talc
MINERAL FAMILY	Hydrous Silicates	
CHEMICAL COMPOSITION	Complex hydrous calcium magnesium silicates	

SECTION II INGREDIENTS

MATERIAL	% RANGE
Talc	20 - 40
Non-asbestiform tremolite and/or anthophyllite	40 - 60
Serpentine	20 - 30
Quartz	1 - 5

SECTION III PHYSICAL DATA

COLOR	White	SPECIFIC GRAVITY (H ₂ O = 1)	±2.8
APPEARANCE	Powder		
OTHER PROPERTIES			

SECTION IV HEALTH HAZARD DATA

MATERIAL	*TLV
Talc	20 Mppcf
Non-asbestiform tremolite and anthophyllite	20 Mppcf
Serpentine	50 Mppcf
Quartz	30 mg./cu.m. ÷ % Quartz + 2

SECTION V SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Avoid breathing dust. Use respirator if TLV's exceeded.

CRMC-MAD-000079

DATE May 1, 1975

OVER FOR FURTHER INFORMATION

MINERAL PRODUCT SAFETY DATA SHEET

NOTE: Exposure to all airborne mineral dusts is subject to OSHA regulations in accordance with Section 1910.93 of the Occupational Health and Safety Administration Standard as published in the Federal Register of October 18, 1972, starting on page 22139.

SECTION I

TRADE NAME AND SYNONYMS	IT X, IT 3X, IT 5X, IT FT, IT 325, IT 625	Industrial Talc
MINERAL FAMILY	Hydrous Silicates	
CHEMICAL COMPOSITION	Complex hydrous calcium magnesium silicates	

SECTION II INGREDIENTS

MATERIAL	% RANGE
Talc	20 - 40
Non-asbestiform tremolite and/or anthophyllite	40 - 60
Serpentine	20 - 30
Quartz	1 - 5

SECTION III PHYSICAL DATA

COLOR	White	SPECIFIC GRAVITY (H ₂ O = 1)	±2.8
APPEARANCE	Powder		
OTHER PROPERTIES			

SECTION IV HEALTH HAZARD DATA

MATERIAL	* TLV
Talc	20 Mppcf
Non-asbestiform tremolite and anthophyllite	20 Mppcf
Serpentine	50 Mppcf
Quartz	30 mg./cu.m. ÷ % Quartz = 2

SECTION V SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Avoid breathing dust. Use respirator if TLV's exceeded.
CRMC-MAD-000080

APPENDIX II

Results of Individual Air Samples
And Summary Statistics for
NIOSH Industrial Hygiene Study

GOVERNOR TALC CH.

GOVERNOR TALC CH.

DATE OF STUDY 11/03/75 - 11/07/75

AGENT STUDIED TALC
COMMUNIST, LAWRENCE

SIC CULF 11000

PAGE 1

CRMC-MAD-000082

1. JOB DICTIONARY

CODE JOB TITLE

0101 MINE TENDER

0102 CRUSHER OPERATOR

0103 TRAMMER

0104 SCRAPPER MAN

0105 UNDERGROUND LABORER

0106 DRILLER

0107 DIAMOND DRILLER

0108 RAISE BORING MACHINE OPERATOR

0109 RAISE BORING MACHINE HELPER

0110 UNDERGROUND MUISTMAN

0111 MUISTMAN

0112 UNDERGROUND STOCK CLERK

0113 SUPPLY MAN

0114 ELMOO MAN(MUCKER)

CRMC-MAD-000083

DUTIES

UNDERGROUND SUPERVISOR

TO REGULATE AND CONTROL
FLOW OF MATERIAL FROM CRUDE ORE PACKET THROUGH THE
CRUSHING CIRCUIT TO EITHER STOCK PILES OR LOADING FA-
CILITIES.

FILLS ORE CARS WITH
BROKEN ORE OR WASTE FROM DRIFTS, RAISES OR STOPES AND
TRANSPORTS TO ORE POCKETS, ORE PASSES OR OTHER PLACES
AS DIRECTED.

LOAD ORE INTO TRAM CARS

PERFORMS GENERAL LABOR
WORK SUCH AS DIGGING, SHOVELING, CLEANING DRIFTS, HANDL-
ING TIMBER, MINE SUPPLIES, ETC.

OPERATES ALL REQUIRED
DRILL EQUIPMENT AND MOVES EQUIPMENT IN AND OUT OF
BLASTING AREA

TO OPERATE DIAMOND CORE
DRILL FOR DRILLING TEST AND BLAST HOLES.

MOVE, SET UP AND OPERATE
RAISE BORING MACHINE TO DRILL HOLES.

TO ASSIST RAISE BORING
MACHINE OPERATOR TO MOVE, SET UP AND OPERATE MACHINE.

TO OPERATE HOIST AND
RELATED EQUIPMENT DURING WINZE AND SHAFT DEVELOPMENT
WORK

TO OPERATE HOIST
LOWER OR RAISE CAGE AND SKIP AS SIGNED AND OPERATE
MINE AIR COMPRESSOR

RESPONSIBLE FOR RECEIV-
ING, RECLAIMING, REPAIR, STORAGE AND CONSIGNMENT OF MINE
UNDERGROUND STOCK EQUIPMENT, PARTS ETC., AND PREPARES
AND CUSTONS DAILY EXPLOSIVE SUPPLIES

PROCURES AND DISTRIBUTES
THE SUPPLIES NECESSARY FOR THE OPERATION OF THE MINE
SURFACE AND UNDERGROUND WORKINGS

LOADS BROKEN ORE FR. ORE
POCKETS INTO TRAM CARS USING 1 MAN LOADING MACHINE

1. JOB DICTIONARY

CODE JOB TITLE

0115 FACEMAN

0201 MILL FOREMAN

0202 MILLER

0203 GENERAL LABOURER

0204 CRUSHER OPERATOR

0205 FULLER-KATYON OPERATOR

0206 HANDLING OPERATOR

0207 PROCESS AIR OPERATOR

0208 WHEELER OPERATOR

0209 PACKER

0210 PACKHOUSE UTILITY MAN

0211 PACKER SERVICEMAN

CRMC-MAD-000084

DUTIES

(FINCO MACHINE)

OPERATES THE COMBINED
CAGE AND SKIP TO TRANSPORT MEN, MATERIAL AND EQUIPMENT
TO AND FROM SURFACE TO UNDERGROUND STATION LEVELS AND
THE HAULAGE OF ORE OR WASTE FROM ORE POCKETS TO SUR-
FACE

SUPERVISES MILL GRIND-
ING, DRYING AND PRODUCT BLENDING

GENERAL MILL WORKER

TO PERFORM ALL TYPES OF
LABOR WORK AS ASSIGNED IN AND ABOUT THE MILL YARDS,
AND BUILDING

OPERATES THE DRYER,
SECONDARY CRUSHERS AND ALL AUXILIARY EQUIPMENT IN THE
SECONDARY CRUSHER AREA TO DRY AND REDUCE THE ORE IN
SIZE FOR THEIR PROCESSING

TO SERVICE PACKAGING
OPERATION BY OPERATING F-K EQUIPMENT AND TO LOAD BULK-
PRODUCT INTO DESIGNATED CARRIER

TO OPERATE THE HARDINGE
GRINDING MILLS, SEPARATORS, ALPINE CLASSIFIERS AND ALL
ASSOCIATED EQUIPMENT TO PRODUCE FINISHED PRODUCT AND
AN INTERMEDIATE PRODUCT FOR USE AS FEED TO OTHER SEC-
TIONS

OPERATES THE MILL AIR
COMPRESSOR, ALCOURN HEATER, AND ALL AUXILIARY EQUIPMENT
IN THE PROCESS AIR AREA

OPERATES THE WHEELER
MILL GRINDING EQUIPMENT, THE DUSTEX CYCLONE AND ALL
ASSOCIATED EQUIPMENT

OPERATES THE SEMI-AUTO-
MATIC PACKER AND LOADS BAGGED, FINISHED PRODUCT IN
RAILROAD CARS AND TRUCKS

TO SERVICE PACKING
OPERATION BY MAINTAINING BAG SUPPLY, OPERATING LIFT
TRUCK, AND ASSISTING IN OTHER SERVICE DUTIES IN THE
PACKHOUSE AS DIRECTED

TO SERVICE PACKING
AND CHECKING WEIGHT OF BAGGED, FINISHED PRODUCT
OPERATION BY MAINTAINING AND STENCILLING BAG SUPPLY

E 1. JOB DICTIONARY

CODE JOB TITLE

0212 BAKHOUSE FOREMAN

0213 FORK LIFT OPERATOR/TOW MOTOR OPER.

0214 CAR LINER

0215 TRUCK DRIVER

0216 STOCK CLERK

0217 STENCIL AND CHECKWEIGH MAN

0218 SUPERVISOR OF INVENTORY CONTROL

0219 CALIFORNIA PROCESS OPERATOR

0220 BULK CAN LOADER

0301 REPAIRMAN(MINE)

0302 REPAIRMAN'S HELPER

0303 BLACKSMITH

0304 MAINTENANCE MECHANIC

0305 MOBILE EQUIPMENT MECHANIC

CRMC-MAD-000085

DUTIES

SUPERVISES TALC BAGGING

OPERATES THE TUM MOTOR
AND MAINTAINS WAREHOUSE INVENTORY RECORDS

PREPARES EMPTY RAILROAD
CARS AND TRUCKS FOR LOADING AND PREPARES COMPLETED
CARS FOR SHIPMENT

OPERATES SERVICE VEHICLE
TO TRANSPORT VARIOUS MATERIALS IN OR OUTSIDE PLANT
AREA, LOADS AND UNLOADS VEHICLE

RESPONSIBLE FOR RECEIV-
ING, STORING AND CONSIGNMENT OF EQUIPMENT, SUPPLIES AND
SPARE PARTS, ETC., AND ASSISTS IN MAINTAINING ADEQUATE
STOCK LEVELS OF SUPPLIES AND SPARE PARTS

LABELS TALC BAGS-SHIPMEN

PROPERTY CONTROL

LOADS TALC INTO RAIL BU-
LK CARS USING PNEUMATIC FILLING SYSTEM

TO MAINTAIN AND REPAIR
MINE EQUIPMENT SUCH AS TUGGER-WHISTS, AND INSTALL,
CONSTRUCT AND REPAIR VARIOUS WOOD AND CONCRETE STRUC-
TURES

TO ASSIST THE REPAIRMAN
AND MAINTENANCE MECHANIC IN THE CONSTRUCTION, INSTALL-
ATION, MAINTENANCE AND REPAIR OF MINE MACHINERY AND
EQUIPMENT

TO FORGE, HAMMER-WELD,
HEAT TREAT AND FUSE BY WELDING METAL MATERIALS RE-
QUIRED IN THE CONSTRUCTION, MAINTENANCE AND MINE SUR-
FACE AND UNDERGROUND MACHINERY AND EQUIPMENT

PERFORM THE LAYOUT,
ASSEMBLY, INSTALLATION, REPAIR AND MAINTENANCE OF MINE
SURFACE AND UNDERGROUND MACHINERY, EQUIPMENT AND WOOD
WORK CONSTRUCTION

INSPECT, TEST, ADJUST,
DISMANTLE AND REPLACE UNIT ASSEMBLIES OR PARTS, AND
MAKE COMPLETE REPAIRS TO GASOLINE, ELECTRIC AND DIESEL-
POWERED EQUIPMENT

E 1. JOB DICTIONARY

CODE JOB TITLE

0401 MILLWRIGHT

0402 INSTRUMENT REPAIRMAN

0403 MACHINIST

0404 REPAIRMAN(MILL)

0405 MILLWRIGHT HELPER

0406 SHEET METAL WORKER

0407 QUALITY CONTROL TECH.

0408 LAB TECHNICIAN

0409 ASSISTANT LAB TECHNICIAN

0410 OILER

0411 WELDER

0501 ELECTRICIAN AND ELECTRIC APPRENTICE

0502 JANIITOR

0503 WELDER

CRMC-MAD-000086

DUTIES

TO INSPECT, REPAIR, REPLACE, INSTALL, ADJUST AND MAINTAIN ALL MECHANICAL EQUIPMENT IN THE MILL

TO INSTALL, REPAIR, CALIBRATE, TEST AND ADJUST ANY TYPE OF INTEGRATING, INDICATING, OR GRAPHIC ELECTRICAL OR MECHANICAL INSTRUMENT

TO LAY OUT WORK, SET UP AND OPERATE MACHINE TOOLS, AND PERFORM ANY DISMANTLING, FITTING OR ASSEMBLY WORK REQUIRED FOR PLANT MAINTENANCE OR CONSTRUCTION

INSPECT, REPAIR, REPLACE, INSTALL, ADJUST AND MAINTAIN ALL MECHANICAL EQUIPMENT IN THE MILL

ASSIST TO INSPECT, REPAIR, REPLACE, INSTALL, ADJUST AND MAINTAIN ALL MECHANICAL EQUIPMENT IN THE MILL

TO PERFORM ANY TIN OR SHEET METAL WORK REQUIRED FOR PLANT MAINTENANCE AND CONSTRUCTION

TAKES TALC SAMPLES FOR LAB ANALYSIS

ASSIST IN HC ANALYSIS

RESPONSIBLE FOR THE PROPER LUBRICATION OF ALL MACHINERY AND EQUIPMENT

GENERAL WELDING IN MILL

TO INSPECT, REPAIR, AND WIRE ALL ELECTRICAL APPARATUS, DEVICES, AND CIRCUITS OF ANY VOLTAGE IN THE PLANT OR ASSIGNED AREA INCLUDING POWER TRANSMISSION LINES, TRANSFORMERS, AND RELATED EQUIPMENT

TO SWEEP AND CLEAN FLOOR OF MINE, MILL, OFFICES, LAVATORIES, CHANGE AND DINING ROOMS AND LABORATORY

TO PERFORM ALL KINDS OF WELDING, BRAZING AND CUTTING ON ANY TYPE OF METAL USING GAS AND ELECTRIC WELDING EQUIPMENT

LE 1. JOB DICTIONARY

CODE	JOB TITLE
------	-----------

0504	MOBILE UTILITY OPERATOR
------	-------------------------

0505	WATCHMAN
------	----------

0506	MINE AND MILL ENGINEER
------	------------------------

0601	ASSISTANT RESIDENT MANAGER
------	----------------------------

0602	MINE SUPERINTENDANT
------	---------------------

0603	MILL SUPERINTENDANT
------	---------------------

0604	GENERAL MANAGER
------	-----------------

0605	PERSONNEL AND SAFETY DIRECTOR
------	-------------------------------

0606	OFFICE MANAGER
------	----------------

0607	ENGINEER
------	----------

0608	ENGINEERING TECHNICIAN(DRAFTSMAN)
------	-----------------------------------

0609	SHIPPING AND INVENTORY COORDINATOR
------	------------------------------------

0610	INVENTORY CONTROL CLERK
------	-------------------------

0611	ACCOUNTS PAYABLE CLERK
------	------------------------

0612	SHIPPING CLERK
------	----------------

0613	SECRETARY
------	-----------

0614	RECEPTIONIST
------	--------------

0615	OFFICE CLERK
------	--------------

0616	DRAFTSMAN
------	-----------

CRMC-MAD-000087

DUTIES

TO OPERATE MOBILE EQUIP-
MENT IN VARIOUS CAPACITIES SUCH AS CLEANING UP WASTE,
DIRT AND DEBRIS, SNOW REMOVAL, ETC.

HOME AND HILL SECURITY

OFFICE DUTIES

OFFICE DUTIES

OFFICE DUTIES

OFFICE DUTIES

OFFICE DUTIES

OFFICE DUTIES

2. SAMPLING PROCEDURES

SAMPLING METHOD ANALYTICAL TECH.

GRAVIMETRIC

POST-PRE WEIGHT

IMPINGER SAMPLE OPTICAL MICRO.

CRMCMAD-000088

RESPIRABLE MASS SAMPLES ARE COLLECTED ON MSA POLY-VINYL CHLORIDE FILTERS(5.0UM PORE SIZE) WITH FLOW 1.7 LITERS PER MINUTE. NYLON CYCLONES (10UM) ARE USED FOR SIZE SEPARATION. FILTERS ARE WEIGHED TO THE NEAREST 0.1MG USING A CANN GRAH ELECTROBALANCE AND DUST CONCENTRATIONS REPORTED AS MG/M3.

HIDGEY IMPINGER SAMPLES ARE COLLECTED USING ETHYL ALCOHOL AS THE COLLECTING MEDIUM WITH FLOW 2.83 LITERS PER MINUTE. AFTER DILUTION, SAMPLES ARE PIPETTED INTO DIHM COUNTING CELLS ALLOWING A 30 MINUTE SETTLING TIME. PARTICLE COUNTS ARE MADE BY TWO COUNTERS USING BRIGHT FIELD OPTICAL MICROSCOPY AT 100X. CONCENTRATIONS ARE REPORTED AS MILLIONS OF PARTICLES PER CUBIC FOOT OF AIR(MPPCF).

3. INDIVIDUAL SAMPLE RESULTS

TEST ANALYTICAL TECHNICAL GRAVIMETRIC				POST-PRE WEIGHT		
SHEET	SAMPLE	DATE	TIME	TIME	VOLUME	CONC.
MAY 1975	NO.		ON	OFF	ML	
19	1408	11/06/75	0655	1455	0.8159	0.846
WEIGHTED AVE. = 0.846						
14	1402	11/06/75	0654	1456	0.8193	0.952
WEIGHTED AVE. = 0.952						
18	1421	11/06/75	0703	1455	0.8023	0.125
WEIGHTED AVE. = 0.125						
14	1409	11/06/75	0653	1459	0.8261	0.581
WEIGHTED AVE. = 0.581						
18	1434	11/06/75	0659	1455	0.8091	1.569
WEIGHTED AVE. = 1.569						
17	1403	11/06/75	0700	1455	0.8006	1.723
WEIGHTED AVE. = 1.723						
13	1423	11/06/75	0700	1455	0.8074	0.582
WEIGHTED AVE. = 0.582						
10	1400	11/06/75	0656	1405	0.7292	1.001
WEIGHTED AVE. = 1.001						
14	1419	11/06/75	0658	1340	0.6833	1.419
WEIGHTED AVE. = 1.419						
18	1407	11/06/75	0706	1415	0.7242	0.535
WEIGHTED AVE. = 0.535						
14	1401	11/06/75	0659	1459	0.8159	0.233
WEIGHTED AVE. = 0.233						
14	1419	11/04/75	0719	1420	0.7156	0.643
WEIGHTED AVE. = 0.643						
24	1406	11/03/75	1513	2238	0.7564	0.516
WEIGHTED AVE. = 0.516						
15	1419	11/04/75	0731	1430	0.7122	1.137

CRMC-MAD-000089

UNITS

HG/M3

HG/M3

MOVED TO 700 LEVEL AT 830

HG/M3

HG/M3

DAGGING TO 700 FOOT LEVEL LUNCH TAKEN 1136 TO 1240

HG/M3

SCRAPPING TO 700 FOOT LEVEL

HG/M3

HG/M3

UNDERGROUND LABORER

HG/M3

LUNCH TAKEN FROM 1130 TO 1240

HG/M3

HG/M3

HG/M3

HG/M3

HG/M3

HG/M3

GENERAL LABORER

3. INDIVIDUAL SAMPLE RESULTS

TEST TYPE			ANALYTICAL TECHNIQUE		GRAVIMETRIC		POST-PIRE WEIGHT	
SUBJECT	SAMPLE	DATE	TIME ON	TIME OFF	VOLUME M3	CONC.		
	1000000 AVE. =	1.137						
13	1002	11/04/75	0719	1425	0.7241	1.132		
	1000000 AVE. =	1.132						
21	1000	11/03/75	1438	2238	0.8159	0.600		
	1000000 AVE. =	0.600						
12	1001	11/04/75	0708	1425	0.7428	1.561		
	1000000 AVE. =	1.561						
23	1050	11/03/75	1406	2237	0.8006	0.649		
	1000000 AVE. =	0.649						
11	1056	11/04/75	0707	1430	0.7530	2.735		
	1000000 AVE. =	2.735						
22	1029	11/03/75	1404	2236	0.8023	0.449		
	1000000 AVE. =	0.449						
15	1055	11/04/75	0740	1417	0.6748	0.756		
	1000000 AVE. =	0.756						
15	1031	11/04/75	0743	1420	0.6748	0.415		
	1000000 AVE. =	0.415						
16	1032	11/04/75	0745	1421	0.6731	0.728		
	1000000 AVE. =	0.728						
17	1064	11/04/75	0711	1427	0.7411	0.391		
	1000000 AVE. =	0.391						
18	1059	11/04/75	0711	1426	0.7394	0.460		
	1000000 AVE. =	0.460						
19	1069	11/04/75	0714	1429	0.7394	0.433		
	1000000 AVE. =	0.433						
27	1072	11/03/75	1520	2248	0.7615	0.499		
	1000000 AVE. =	0.499						
24	1045	11/03/75	1526	2253	0.7598	0.947		
	1000000 AVE. =	0.947						
29	1030	11/03/75	1520	2250	0.7649	0.719		
	1000000 AVE. =	0.719						
18	1027	11/04/75	0730	1428	0.7105	0.436		

CRMC-MAD-000090

UNITS

HG/M3

HG/M3

HG/M3

HG/M3

HG/M3

HG/M3

HG/M3

HG/M3

HG/M3

HG/M3

HG/M3

HG/M3

HG/M3

HG/M3

HG/M3

HG/M3

3. INDIVIDUAL SAMPLE RESULTS

SHEET ANALYTICAL TECHNIQUE GRAVIMETRIC				POST-PRE WEIGHT			
SHEET	SAMPLE	DATE	TIME ON	TIME OFF	VOLUME H3	CONC.	
1	24	1057	11/03/75	1525	2252	0.7598	0.395
WEIGHTED AVE. =		0.436					
2	11	1060	11/04/75	0810	1428	0.6425	0.218
WEIGHTED AVE. =		0.218					
2	25	1077	11/03/75	1521	2300	0.7802	0.282
WEIGHTED AVE. =		0.282					
3	10	1359	11/04/75	0737	1424	0.6918	0.231
WEIGHTED AVE. =		0.231					
3	14	1043	11/04/75	0715	1424	0.7292	0.439
WEIGHTED AVE. =		0.439					
3	26	1032	11/03/75	1524	2247	0.7530	0.372
WEIGHTED AVE. =		0.372					
14	10	1028	11/04/75	0737	1429	0.7003	0.314
WEIGHTED AVE. =		0.314					
20	14	1036	11/04/75	0755	1413	0.6425	0.249
WEIGHTED AVE. =		0.249					
01	11	1453	11/06/75	0654	1455	0.8176	1.137
WEIGHTED AVE. =		1.137					
02	12	1435	11/06/75	0655	1455	0.8159	0.858
WEIGHTED AVE. =		0.858					
04	15	1648	11/06/75	0701	1455	0.8057	0.422
WEIGHTED AVE. =		0.422					
01	14	1005	11/07/75	0715	1327	0.6323	0.158
WEIGHTED AVE. =		0.158					
01	10	1400	11/07/75	0723	1325	0.6153	4.647
WEIGHTED AVE. =		4.647					
02	16	1650	11/07/75	0729	1336	0.6238	0.593
WEIGHTED AVE. =		0.593					
02	14	1470	11/07/75	0746	1300	0.5337	0.581
WEIGHTED AVE. =		0.581					

CRMC-MAD-000091

UNITS

HG/M3

HG/M3

HG/M3

HG/M3

HG/M3

HG/M3

HG/M3

HG/M3

HG/M3

HG/M3

HG/M3

WORKING AT SHAFT STATION

HG/M3

HG/M3

HG/M3

HG/M3

3. INDIVIDUAL SAMPLE RESULTS

TEST TYPE		ANALYTICAL TECHNIQUE		GRAVIMETRIC		/POST-PIRE WEIGHT	
SHEET	SAMPLE	DATE	TIME	TIME	VOLUME	CONC.	
			ON	OFF	ML		
3	14 10-4	11/07/75	0712	1324	0.0323	0.395	
	WEIGHTED AVE. =	0.395					
5	18 1344	11/07/75	0725	1331	0.0221	2.457	
	WEIGHTED AVE. =	2.457					
2	10 1144	11/07/75	0710	1325	0.0238	0.497	
	WEIGHTED AVE. =	0.497					
0	15 1002	11/04/75	0707	1427	0.1419	0.722	
	WEIGHTED AVE. =	0.722					
1	18 1073	11/07/75	0727	1327	0.0119	0.752	
	WEIGHTED AVE. =	0.752					

CRMC-MAD-000092

UNITS

MG/H3

MG/H3

MG/H3

MG/H3

MG/H3

7. INDIVIDUAL SAMPLE RESULTS

TEST: TALS
 SAMPLE METHOD/ANALYTICAL TECHNIQUE: IMPINGER SAMPLE/OPTICAL MICRO

SHEET NO.	SAMPLE NO.	DATE	TIME ON	TIME OFF	VOLUME CF	CONC.
3	10	0135	11/06/75		3.0000	12.708
WEIGHTED AVE. = 12.708						
3	10	0020	11/06/75	0112	0129	1.0990 12.424
3	10	0554	11/06/75	1204	1312	2.7985 5.951
WEIGHTED AVE. = 8.396						
4	11	0005	11/06/75	0845	0915	3.0000 4.308
WEIGHTED AVE. = 4.308						
4	12	0445	11/06/75	0800	0830	3.0000 3.844
WEIGHTED AVE. = 3.844						
4	17	0145	11/06/75		2.0000	18.372
4	17	0215	11/06/75		3.0000	18.743
4	17	0375	11/06/75		1.0000	24.536
WEIGHTED AVE. = 19.505						
6	10	0535	11/06/75	0938	0953	1.5017 11.670
WEIGHTED AVE. = 11.670						
14	14	0233	11/06/75		3.0000	15.774
WEIGHTED AVE. = 15.774						
15	18	0001	11/06/75		3.0000	1.972
WEIGHTED AVE. = 1.972						
201	14	0344	11/04/75	1145	1215	3.0000 3.940
WEIGHTED AVE. = 3.940						

CRMC-MAD-000093

UNITS

MPPCF USING A PICK AND A SLEDGE ON BIG PIECES OF ORE, NO RESPIRATOR

MPPCF SAMPLER WAS HOOKED ONTO TRAMMER CAR FOR 17 MINUTES

MPPCF SAMPLER HOOKED ONTO TRAMMING CAR FOR 20 MINUTES

MPPCF SCRAPPERRMAN PULLING ORE TO 700 LEVEL

MPPCF SCRAPING ORE DOWN TO 700 FOOT LEVEL, NO RESPIRATOR

MPPCF

MPPCF

MPPCF

MPPCF DRILLING HOLES INTO ROCK STARTING AT 800 FEET AND WORKING DOWN TO 900 FEET NO RESPIRATOR.

MPPCF PICKING UP ORE WITH HUCKING MACHINE AND PUTTING IN CARS, RESPIRATOR WAS NOT WORKING

MPPCF

MPPCF CHECKING INSTRUMENTS, CONVEYER AND COLLECTIONS ON ROOF FOR 20 MINUTES, 10 MINUTE IN CONTROL ROOM, DOES THIS 2 TIMES PER SHIFT

4. INDIVIDUAL SAMPLE RESULTS

TABLE

REPRODUCIBILITY OF INSTRUMENT RESPONSE SAMPLE/OPTICAL MICRO.

SHEET NO.	SAMPLE NO.	DATE	TIME IN	TIME OFF	VOLUME CF	CONC.
20	0415	11/03/75			3.0000	1.813

WEIGHTED AVE. = 1.813

19	0201	11/04/75	1325	1355	3.0000	0.546
----	------	----------	------	------	--------	-------

WEIGHTED AVE. = 0.546

14	0694	11/06/75	1230	1300	3.0000	2.911
----	------	----------	------	------	--------	-------

14	0704	11/06/75	0908	0938	3.0000	2.656
----	------	----------	------	------	--------	-------

WEIGHTED AVE. = 2.784

13	0783	11/04/75	0944	1014	3.0000	3.515
----	------	----------	------	------	--------	-------

WEIGHTED AVE. = 3.515

21	0274	11/03/75			3.0000	1.204
----	------	----------	--	--	--------	-------

WEIGHTED AVE. = 1.204

12	0241	11/04/75	1038	1108	3.0000	3.926
----	------	----------	------	------	--------	-------

WEIGHTED AVE. = 3.926

23	0131	11/03/75			3.0000	2.884
----	------	----------	--	--	--------	-------

WEIGHTED AVE. = 2.884

11	0705	11/04/75	0833	0903	3.0000	3.579
----	------	----------	------	------	--------	-------

WEIGHTED AVE. = 3.579

22	0613	11/03/75			3.0000	2.540
----	------	----------	--	--	--------	-------

WEIGHTED AVE. = 2.540

CRMC-MAD-000094

UNITS

MPPCF

CHECKING INSTRUMENTS FOR 12 MINUTES, IN CONTROL ROOM
FOR REMAINING 18 MINUTES, WORE RESPIRATOR

MPPCF

MOVING SCRAP IRON OUTSIDE

MPPCF

PROCESSING WET ORE FROM 1100 LEVEL

MPPCF

SECONDARY CRUSHER OPERATOR RUNNING CRUSHER AT HEAD
FRAME

MPPCF

WATCHED BIN SIFT AND CHECKED CONVEYOR, STAYED IN
CONTROL ROOM MOST OF TIME

MPPCF

CHECKING INSTRUMENTS FOR 7 MINUTES, STAYED IN CONTROL
ROOM FOR 23 MINUTES, NO RESPIRATOR

MPPCF

WEIGHING OUT SAMPLES AND CHECKING INSTRUMENTS FOR TO-
TAL TIME OF 30 MINUTES, HEAVY EXPOSURE, WORE RESPIRA.

MPPCF

TAKING HOURLY SAMPLE FOR 5 MINUTES, STAYED IN CONTROL
ROOM FOR OTHER 25 MINUTES, WEARS RESPIRATOR

MPPCF

LEAK CORRECTIONS AND INSTRUMENTATION CHECK FOR 7
MINUTES, REMAINDER 23 MINUTES OUTSIDE OF CONTROL R.

MPPCF

INSPECTING SCALES, COMPRESSOR AND DUST COLLECTORS ON
ROOF FOR 10 MINUTES, 20 MINUTES IN CONTROL ROOM, WORE
RESPIRATOR

LE 4. INDIVIDUAL SAMPLE RESULTS

ANALYST		ANALYTICAL TECHNIQUE		IMPINGER SAMPLE		OPTICAL MICRO.	
NO.	SHORT NAME	SAMPLE	DATE	TIME IN	TIME OFF	VOLUME CF	CONC.
09	1E	0745	11/04/75			3.0000	0.384
1	WEIGHTED AVE. =		0.359				
19	1E	0650	11/04/75			3.0000	3.733
29	1E	0645	11/04/75			3.0000	1.968
2	WEIGHTED AVE. =		2.051				
09	27	0516	11/03/75			3.0000	2.481
2	WEIGHTED AVE. =		2.481				
09	28	0163	11/03/75			3.0000	2.964
19	28	0643	11/03/75			3.0000	3.977
2	WEIGHTED AVE. =		3.471				
211	2A	0436	11/03/75			3.0000	2.131
2	WEIGHTED AVE. =		2.131				
213	1P	0645	11/04/75			3.0000	1.638
2	WEIGHTED AVE. =		1.638				
213	26	0553	11/03/75			3.0000	1.638
2	WEIGHTED AVE. =		1.638				
302	12	0774	11/06/75			2.3992	3.633
2	WEIGHTED AVE. =		3.633				
304	15	0264	11/06/75	1255	1325	3.0000	1.469
2	WEIGHTED AVE. =		1.469				

CRMC-MAD-000095

UNITS

HPPCF

HPPCF

HPPCF

HPPCF

HPPCF

HPPCF

FILLING SACKS WITH PRODUCT BY MACHINE, SEVERAL BAGS
BURST DURING SAMPLING

HPPCF

HPPCF

HPPCF

HPPCF

HPPCF

WORKING AT SHAFT STATION

E 5. STATISTICS

TEST TYPE

PLC METHOD/ANALYTICAL TECHNIQUE: GRAVIMETRIC

/POST-PHE WEIGHT

JOB	NO. OF SAMPLES	RANGE MG/M3 (HI-LOW)	MEAN MG/M3	MEDIAN MG/M3	I.M. AVE. DEVIATION	STANDARD DEVIATION
0103	003	000.452-000.125	0.641	0.646	0.644	0.450
0104	003	001.723-001.581	1.291	1.509	1.285	0.620
0105	001	000.582-001.582	0.582	0.582	0.582	0.000
0106	003	001.414-001.535	0.955	1.001	0.976	0.442
0115	001	000.233-000.233	0.233	0.233	0.233	0.000
AREA						
01	011	001.723-000.125	0.679	0.846		0.527
0201	002	000.643-000.516	0.580	0.580	0.578	0.090
0203	001	001.137-001.137	1.137	1.137	1.137	0.000
0214	002	001.132-000.600	0.866	0.866	0.850	0.376
0205	002	001.501-000.649	1.105	1.105	1.088	0.645
0208	002	002.733-000.449	1.592	1.592	1.556	1.616
0209	004	000.447-000.371	0.594	0.449	0.594	0.197
0211	002	000.430-000.395	0.416	0.416	0.415	0.029
0212	002	000.202-000.218	0.250	0.250	0.253	0.045
0213	003	000.434-000.231	0.347	0.372	0.350	0.106
0214	001	000.314-000.314	0.314	0.314	0.314	0.000
0220	001	000.249-000.249	0.249	0.249	0.249	0.000
AREA						
02	027	002.733-000.218	0.656	0.460		0.521
0301	001	001.137-001.137	1.137	1.137	1.137	0.000
0302	001	000.858-000.858	0.858	0.858	0.858	0.000
0304	001	000.422-000.422	0.422	0.422	0.422	0.000
AREA						
03	003	001.137-000.422	0.806	0.858		0.360
0401	002	004.647-000.158	2.403	2.403	2.372	3.174
0402	002	000.593-000.581	0.587	0.587	0.587	0.008
0403	001	000.395-000.395	0.395	0.395	0.395	0.000
0405	001	002.457-002.457	2.457	2.457	2.457	0.000
0406	001	000.497-000.497	0.497	0.497	0.497	0.000
0410	001	000.722-000.722	0.722	0.722	0.722	0.000
0411	001	000.752-000.752	0.752	0.752	0.752	0.000
AREA						
04	009	004.647-000.158	1.256	0.593		1.514
PLANT TOTAL						
050	004	004.647-000.125	0.820	0.582		0.794

CRMC-MAD-000096

STANDARD	JOB TITLE
FRHJR	
0,200	TRAMMER
0,350	SCRAPPER MAN
0,000	UNDERGROUND LABORER
0,255	DRILLER
0,000	CAGEMAN
0,159	
0,063	HILL FOREMAN
0,000	GENERAL LABORER
0,206	CRUSHER OPERATOR
0,456	HARDINGE OPERATOR
1,143	WHEELER OPERATOR
0,066	PACKER
0,020	PACKER SERVICEMAN
0,032	PACKHOUSE FOREMAN
0,061	FORK LIFT OPERATOR/TON MOTOR OPER.
0,000	CAR LINER
0,040	BULK CAR LOADER
0,100	
0,000	REPAIRMAN(MINE)
0,000	REPAIRMAN'S HELPER
0,000	MAINTENANCE MECHANIC
0,208	
2,244	MILLWRIGHT
0,006	INSTRUMENT REPAIRMAN
0,000	MACHINIST
0,000	MILLWRIGHT HELPER
0,000	SHEET METAL WORKER
0,000	OILER
0,000	WELDER
0,505	
0,112	

LE 6. STATISTICS

ESTIMATE
SAMPLE METHOD/ANALYTICAL TECHNIQUE/IMPINGER SAMPLE/OPTICAL METHOD

DATE	NO. OF SAMPLES	RANGE PPMCF (HI-LOW)	MEAN PPMCF	MEDIAN PPMCF	1.0. AVE. DEVIATION	STANDARD ERROR	STANDARD ERROR
0103	003	012,100-005,451	19,301	12,424	10,121	3,822	2,207
0104	005	024,530-003,044	13,401	10,372	11,830	4,350	4,181
0106	001	011,070-011,078	11,070	11,070	11,070	0,000	0,000
0114	001	015,774-015,774	15,774	15,774	15,774	0,000	0,000
0115	001	001,472-001,472	1,472	1,472	1,472	0,000	0,000
AREA 01	011	024,530-001,472	11,840	12,424		7,217	2,176
0201	002	005,440-001,013	2,877	2,877	2,877	1,504	1,063
0203	001	000,540-000,540	0,540	0,540	0,540	0,000	0,000
0204	004	003,515-001,200	2,572	2,184	2,572	0,980	0,490
0206	002	003,420-002,084	3,405	3,405	3,405	0,737	0,521
0208	002	003,514-002,540	3,000	3,000	3,000	0,735	0,519
0209	000	000,504-001,408	3,585	3,349	3,585	1,564	0,638
0211	001	002,131-002,131	2,131	2,131	2,131	0,000	0,000
0213	002	001,030-001,030	1,030	1,030	1,030	0,000	0,000
AREA 02	020	000,304-000,540	2,821	2,770		1,287	0,288
0302	001	003,033-003,033	3,033	3,033	3,033	0,000	0,000
0304	001	001,409-001,409	1,409	1,409	1,409	0,000	0,000
AREA 03	002	003,033-001,409	2,551	2,551		1,530	1,082
PLANT TOTAL	033	024,530-000,540	5,813	3,574		6,009	1,046

END OF REPORT

CRMC-MAD-000097

JOB TITLE

TRAMMER
SCRAPPER MAN
DRILLER
EIMCO MAN (HUCKER)
CAGE MAN

MILL FOREMAN
GENERAL LABORER
CRUSHER OPERATOR
HARDINGE OPERATOR
WHEELER OPERATOR
PACKER
PACKER SERVICE MAN
FORK LIFT OPERATOR/TOM MOTOR OPER.

REPAIRMAN'S HELPER
MAINTENANCE MECHANIC

GOVERNOR TALL CO.

GOVERNMENTAL.

DATE OF STUDY 11/03/75 - 11/07/75

AGENT STUDIED SILICA
COUNTYIST, LAWRENCE

SIC CODE 11496

CRMC-MAD-000098

7. SAMPLING PROCEDURES

PAGE 1 18

SAMPLING METHOD ANALYTICAL TECH.

GRAVIMETRIC XRAYDIFFRACTION

RESPIRABLE MASS SAMPLES ARE COLLECTED ON HSA POLY-
VINYL CHLORIDE FILTERS (5.0UM PORE SIZE) AT A FLOW
RATE OF 1.7 LITER PER MINUTE. NYLON CYCLONES (10MM)
ARE USED FOR SIZE SEPARATION. FREE SILICA DETERMINA-
TIONS ARE MADE USING QUANTITATIVE X-RAY DIFFRACTION
AND SILICA CONCENTRATIONS REPORTED AS MG/M3.

CRMC-MAD-000099

E. B. INDIVIDUAL SAMPLE RESULTS

CELL: 01103

ANALYTICAL TECHNIQUE: GRAVIMETRIC

ANALYTICAL FRACTION

LS	SHEET	SAMPLE	DATE	TIME ON	TIME OFF	VOLUME M3	CONC.
103	14	1404	11/06/75	0655	1455	0.8159	0.025
WEIGHTED AVE. =			0.025				
103	15	1404	11/06/75	0654	1450	0.8193	0.024
WEIGHTED AVE. =			0.024				
103	16	1424	11/06/75	0703	1455	0.8023	0.012
WEIGHTED AVE. =			0.012				
104	1A	1409	11/06/75	0653	1459	0.8261	0.012
WEIGHTED AVE. =			0.012				
104	1E	1358	11/06/75	0659	1455	0.8091	0.012
WEIGHTED AVE. =			0.012				
104	17	1403	11/06/75	0704	1455	0.8006	0.012
WEIGHTED AVE. =			0.012				
105	1F	1441	11/06/75	0659	1459	0.8159	0.012
WEIGHTED AVE. =			0.012				
105	13	1423	11/06/75	0700	1455	0.8074	0.000
WEIGHTED AVE. =			0.000				
106	1C	1445	11/06/75	0656	1405	0.7292	0.000
WEIGHTED AVE. =			0.000				
106	16	1419	11/05/75	1240	1340	0.6833	0.028
WEIGHTED AVE. =			0.028				
106	18	1437	11/06/75	0706	1415	0.1019	0.000
WEIGHTED AVE. =			0.000				
0201	14	1449	11/04/75	0719	1420	0.7156	0.014
WEIGHTED AVE. =			0.014				
0201	24	1406	11/05/75	1513	2230	0.7564	0.013
WEIGHTED AVE. =			0.013				

CRMC-MAD-000100

UNIT 13

MG/H3

CLEANED UP AND PERFORMED DUTIES AS A TRAMMER.
PUMP TURNED OFF BETWEEN 11:46 AND 12:40

MG/H3

MOVED TO 700 LEVEL AT 8:30

MG/H3

MG/H3

PUMP TURNED OFF BETWEEN 11:36 AND 12:40.
DRAGGING TO 700 FOOT LEVEL; LUNCH TAKEN 11:36 TO 12:14

MG/H3

SCRAPPED DOWN TO 700 FOOT LEVEL.
PUMP TURNED OFF BETWEEN 11:30 AND 12:40

MG/H3

MG/H3

MG/H3

MG/H3

MG/H3

MG/H3

X RAY ANALYSIS IMPOSSIBLE DUE TO INTERFERENCE

MG/H3

MG/H3

B. INDIVIDUAL SAMPLE RESULTS

SILICA		GRAVIMETRIC		XRAY DIFFRACTION		
SHEET NO.	SAMPLE NO.	DATE	TIME MIN.	TIME MIN.	VOLUME ML	CONC.
15	1419	11/04/75	0731	1430	0.7122	0.014
-EIGHTED AVE. =		0.014				
13	1402	11/04/75	0719	1425	0.7241	0.028
-EIGHTED AVE. =		0.028				
21	1430	11/03/75	1438	2230	0.8159	0.012
-EIGHTED AVE. =		0.012				
12	1401	11/04/75	0708	1425	0.8159	0.000
23	1454	11/03/75	1406	2237	0.8006	0.012
-EIGHTED AVE. =		0.012				
11	1456	11/04/75	0707	1430	0.8006	0.000
22	1429	11/03/75	1404	2236	0.8023	0.012
-EIGHTED AVE. =		0.012				
18	1445	11/04/75	0740	1417	0.6748	0.015
-EIGHTED AVE. =		0.015				
16	1431	11/04/75	0743	1420	0.6748	0.000
-EIGHTED AVE. =		0.000				
15	1439	11/04/75	0745	1421	0.6748	0.000
17	1404	11/04/75	0711	1427	0.7411	0.000
-EIGHTED AVE. =		0.000				
14	1459	11/04/75	0711	1426	0.7411	0.000
19	1459	11/04/75	0714	1429	0.7394	0.014
-EIGHTED AVE. =		0.014				
27	1472	11/03/75	1520	2248	0.7015	0.013
-EIGHTED AVE. =		0.013				
24	1445	11/03/75	1526	2253	0.7598	0.013
-EIGHTED AVE. =		0.013				
29	1430	11/03/75	1520	2250	0.7049	0.013
-EIGHTED AVE. =		0.013				

CRMC-MAD-000101

UNITS

HG/H3

GENERAL LABORER

HG/H3

HG/H3

HG/H3

X-RAY ANALYSIS IMPOSSIBLE DUE TO INTERFERENCES

HG/H3

HG/H3

X RAY ANALYSIS IMPOSSIBLE DUE TO INTERFERENCES

HG/H3

HG/H3

HG/H3

HG/H3

X-RAY ANALYSIS IMPOSSIBLE DUE TO INTERFERENCES

HG/H3

HG/H3

X-RAY ANALYSIS IMPOSSIBLE DUE TO INTERFERENCES

HG/H3

HG/H3

HG/H3

HG/H3

E 8. INDIVIDUAL SAMPLE RESULTS

AT: SIOCCA

PLE METHOD/ANALYTICAL TECHNIQUE: GRAVIMETRIC / XRAY DIFFRACTION

	SHIFT	SAMPLE	DATE	TIME ON	TIME OFF	VOLUME M3	CONC.
E	MAN 10, 11, 12						
11	14	1427	11/04/75	0730	1428	0.7105	0.000
E	WEIGHTED AVE. =	0.000					
11	24	1457	11/03/75	1525	2252	0.7598	0.013
E	WEIGHTED AVE. =	0.013					
12	11	1460	11/04/75	0810	1428	0.6425	0.016
E	WEIGHTED AVE. =	0.016					
12	25	1477	11/03/75	1521	2300	0.7002	0.013
E	WEIGHTED AVE. =	0.013					
13	10	1354	11/04/75	0737	1424	0.7002	0.000
13	14	1443	11/04/75	0715	1424	0.7002	0.000
13	26	1432	11/03/75	1524	2247	0.7530	0.000
E	WEIGHTED AVE. =	0.000					
14	10	1428	11/04/75	0737	1429	0.7003	0.000
E	WEIGHTED AVE. =	0.000					
20	14	1436	11/04/75	0755	1413	0.6425	0.016
E	WEIGHTED AVE. =	0.016					
301	11	1453	11/06/75	0654	1455	0.6425	0.000
302	11	1435	11/06/75	0655	1455	0.8159	0.000
E	WEIGHTED AVE. =	0.000					
304	15	1648	11/06/75	0701	1455	0.8057	0.000
E	WEIGHTED AVE. =	0.000					
401	14	1405	11/07/75	0715	1327	0.6323	0.016
E	WEIGHTED AVE. =	0.016					
401	10	1300	11/07/75	0723	1325	0.6153	0.065
E	WEIGHTED AVE. =	0.065					
402	10	1450	11/07/75	0729	1336	0.6153	0.000
402	14	1470	11/07/75	0746	1300	0.5337	0.000
E	WEIGHTED AVE. =	0.000					

CRMC-MAD-000102

UNITS

HG/H3

HG/H3

HG/H3

HG/H3

HG/H3

X-RAY ANALYSIS IMPOSSIBLE DUE TO INTERFERENCES

HG/H3

HG/H3

HG/H3

HG/H3

HG/H3

X-RAY ANALYSIS IMPOSSIBLE DUE TO INTERFERENCES

HG/H3

HG/H3

WORKING AT SHAFT STATION.

HG/H3

HG/H3

HG/H3

X-RAY ANALYSIS IMPOSSIBLE DUE TO INTERFERENCES

HG/H3

E 8. INDIVIDUAL SAMPLE RESULTS

PAGE 122

SILICA

SILICA ANALYSIS BY GRAVIMETRIC

/XRAY DIFFRACTION

SHEET	SAMPLE	DATE	TIME	TIME	VOLUME	CONC.	UNITS
			ON	OFF	ML		
E	MA-01, SI,						
3	1A	11/07/75	0712	1324	0.6323	0.000	MG/H3
	WEIGHTED AVE. =	0.000					
4	1A	11/07/75	0725	1331	0.6221	0.016	MG/H3
	WEIGHTED AVE. =	0.016					
6	1C	11/07/75	0718	1325	0.6238	0.000	MG/H3
	WEIGHTED AVE. =	0.000					
8	1B	11/04/75	0707	1427	0.7479	0.013	MG/H3
	WEIGHTED AVE. =	0.013					
1	1A	11/07/75	0727	1327	0.6119	0.016	MG/H3
	WEIGHTED AVE. =	0.016					

SAMPLE WAS DELETED FROM THE STATISTICAL RESULTS (TABLE 4) AND THE TIME WEIGHTED AVERAGES

CRMCMAD-000103

LE 9. STATISTICS

TEST: SELECT

MODEL: METROANALYTICAL TECHNIQUES GRAVIMETRIC

XRAY DIFFRACTION

DATA	N. OF	RANGE	MEAN	MEDIAN	I. A.	STANDARD
CASE	SAMPLES	(MIN-MAX)	MG/MS	MG/MS	AVE. DEVIATION	DEVIATION
0153	003	000,025-000,012	0,020	0,024	0,020	0,007
0154	003	000,012-000,012	0,012	0,012	0,012	0,000
0155	002	000,012-000,000	0,000	0,000	0,000	0,008
0156	002	000,028-000,000	0,014	0,014	0,014	---

AREA

01	010	000,008-000,000	0,013	0,012		0,059
0201	002	000,014-000,013	0,014	0,014	0,013	0,000
0203	001	000,014-000,014	0,014	0,014	0,014	0,000
0204	002	000,020-000,012	0,020	0,020	0,020	0,011
0206	001	000,012-000,012	0,012	0,012	0,012	0,000
0208	001	000,012-000,012	0,012	0,012	0,012	0,000
0209	007	000,015-000,000	0,010	0,013	0,010	0,007
0211	002	000,013-000,000	0,007	0,007	0,007	0,009
0212	002	000,010-000,013	0,015	0,015	0,014	0,002
0213	001	000,000-000,000	0,000	0,000	0,000	0,000
0214	001	000,000-000,000	0,000	0,000	0,000	0,000
0220	001	000,010-000,010	0,010	0,010	0,010	0,000

AREA

02	021	000,020-000,000	0,011	0,013		0,007
0302	001	000,000-000,000	0,000	0,000	0,000	0,000
0304	001	000,000-000,000	0,000	0,000	0,000	0,000

AREA

03	002	000,000-000,000	0,000	0,000		0,000
0401	002	000,005-000,010	0,041	0,041	0,040	0,035
0402	001	000,000-000,000	0,000	0,000	0,000	0,000
0403	001	000,000-000,000	0,000	0,000	0,000	0,000
0405	001	000,010-000,010	0,010	0,010	0,010	0,000
0406	001	000,000-000,000	0,000	0,000	0,000	0,000
0410	001	000,013-000,013	0,013	0,013	0,013	0,000
0411	001	000,010-000,010	0,010	0,010	0,010	0,000

AREA

04	000	000,005-000,000	0,010	0,015		0,021
----	-----	-----------------	-------	-------	--	-------

PLANT TOTAL

041	000,028-000,000	0,012	0,013		0,031
-----	-----------------	-------	-------	--	-------

END OF REPORT

CRMC-MAD-000104

STANDARD	JOB TITLE
0,004	TRAMPER
0,003	SCRAPPER MAN
0,006	UNDERGROUND LABORER
---	DRILLER
0,019	
0,000	HILL FOREMAN
0,000	GENERAL LABORER
0,008	CRUSHER OPERATOR
0,000	HARDINGE OPERATOR
0,000	WHEELER OPERATOR
0,002	PACKER
0,000	PACKER SERVICEMAN
0,001	PACKHOUSE FOREMAN
0,000	FORK LIFT OPERATOR/TOW MOTOR-OPER,
0,000	CAR LINER
0,000	BULK CAR LOADER
0,002	
0,000	REPAIRMAN'S HELPER
0,000	MAINTENANCE MECHANIC
0,000	
0,024	MILLWRIGHT
0,000	INSTRUMENT REPAIRMAN
0,000	MACHINIST
0,000	MILLWRIGHT HELPER
0,000	SHEET METAL WORKER
0,000	OILER
0,000	WELDER
0,007	
0,005	

GOVERNMENT TALK CO.

GOVERNMENT, N.Y.

DATE OF STUDY: 11/03/75 - 11/07/75

AGENT STUDIED: ASBESTOS
COUNTY: LAWRENCE

SIC CODE: 1496

CRMC-MAD-000105

10. SAMPLING PROCEDURES

SAMPLING METHOD ANALYTICAL TECH.

ST03

FIBER COUNT

OPTICAL MICRO.

ST03

FIBER COUNT

ELECTRON MICRO.

CRMC-MAD-000106

AIRBORNE FIBERS ARE COLLECTED ON MILLIPORE TYPE AA MEMBRANE FILTERS AT A FLOW OF 1.7 LITERS PER MINUTE. FIBERS GREATER THAN 5 MICROMETERS IN LENGTH ARE COUNTED WITH PHASE CONTRAST MICROSCOPY AT 430X AS DESCRIBED IN NIOSH CRITERIA DOCUMENT FOR ASBESTOS (1972).

AIRBORNE FIBERS ARE COLLECTED ON MILLIPORE TYPE AA MEMBRANE FILTERS AT A FLOW OF 1.7 LITERS PER MINUTE. SAMPLES ARE MOUNTED ON 200 MESH (CARBON COATED) COPPER GRIDS USING THE JAFFE METHOD WITH ACETONE. ASBESTOS FIBERS ARE IDENTIFIED USING SELECTED AREA ELECTRON DIFFRACTION AND ENERGY DISPERSIVE XRAY ANALYSIS. ASBESTOS FIBERS ARE COUNTED AND SIZED USING THE GRID OPENING TO DEFINE THE COUNTING FIELD AND CALIBRATED MARKS ON THE MICROSCOPE SCREEN FOR FIBER SIZING.

2 II. INDIVIDUAL SAMPLE RESULTS

MT 25-6505

2.2 POLYMER/ANALYTICAL TECHNIQUE: FIBER COUNT OPTICAL MICRO.

	SHEET	SAMPLE	DATE	TIME ON	TIME OFF	VOLUME LITERS	CONC.
E	11	G198	11/05/75	0936	1025	83,3000	14,673
2	11	G220	11/05/75	1025	1149	83,3000	0,000
2	11	G221	11/05/75	0852	0805	124,1000	7,714
2	11	G225	11/05/75	0805	0936	154,7000	8,874
2	11	G241	11/05/75	1259	1415	129,2000	9,740
E	WEIGHTED AVE. =		9,792				
03	1A	G155	11/05/75	1250	1403	124,1000	2,571
03	1A	G218	11/05/75	1112	1144	54,4000	9,625
03	1A	G224	11/05/75	0846	1112	248,2000	2,863
03	1A	G236	11/05/75	0700	0846	180,2000	5,079
E	WEIGHTED AVE. =		4,067				
03	10	G199	11/05/75	1340	1455	127,5000	3,387
03	10	G194	11/05/75	1104	1340	197,2000	3,511
03	10	G195	11/05/75	1041	1144	107,1000	8,096
03	10	G196	11/05/75	0859	1041	173,4000	8,299
03	10	G232	11/05/75	0703	0859	197,2000	6,504
E	WEIGHTED AVE. =		5,874				
103	1E	G199	11/05/75	0900	1045	178,5000	5,836
103	1E	G211	11/05/75	1045	1151	112,2000	10,787
103	1E	G217	11/05/75	1151	1455	312,8000	2,300

CRMC-MAD-000107

UNITS

FB/CC

700 FOOT CRUSHERMAN

FB/CC

1100 FT CRUSHER, 500 HIGH TO COUNT.

FR/CC

3 CHARGES SET OFF, DRILLED AND WORKED CRUSHER-DUSTY.

FB/CC

WORKING CRUSHER & DRILLING, 80-90% AT CRUSHER,

FB/CC

20 MIN IN BREAK ROOM.

FB/CC

FB/CC

FB/CC

FR/CC

FR/CC

FB/CC

TRAMMING 23 SLOPE TOOK LUNCH BREAK 1130-1215

FB/CC

FR/CC

FR/CC

TRAMMING #23 STOPE.

FB/CC

FB/CC

TRAMMING 23 STOPE.

FB/CC

TRAMMING STOPE 23, TOOK 45 MIN LUNCH BREAK.

II. INDIVIDUAL SAMPLE RESULTS

SILICA ASBESTOS		ANALYTICAL TECHNIQUE: FIBER COUNT				OPTICAL MICRO,	
SAMPLE NO.	SUBJECT	SAMPLE NO.	DATE	TIME ON	TIME OFF	VOLUME LITERS	CONC.
003	14	G230	11/05/75	0704	0900	197,2000	2,814
WEIGHTED AVE. = 4,400							
003	12	G214	11/05/75	0836	1021	178,5000	8,703
003	12	G219	11/05/75	1021	1141	136,0000	10,626
003	12	G222	11/05/75	0853	0836	175,1000	3,748
WEIGHTED AVE. = 7,465							
003	17	G156	11/05/75	1240	1455	229,5000	2,672
003	17	G217	11/05/75	1019	1100	69,7000	14,599
003	17	G226	11/05/75	0659	0902	209,1000	4,319
003	17	G228	11/05/75	0902	1019	130,9000	3,174
WEIGHTED AVE. = 6,014							
003	19	G149	11/05/75	1325	1415	85,0000	4,209
003	19	G195	11/05/75	0832	1022	187,0000	9,724
003	19	G213	11/05/75	1102	1145	73,1000	11,037
003	19	G237	11/05/75	0700	0832	156,4000	4,697
003	19	G212	11/05/75	1022	1102	68,0000	11,157
WEIGHTED AVE. = 7,800							
0105	16	G198	11/05/75	1340	1457	130,9000	4,644
0106	16	G240	11/05/75	0917	1040	141,1000	6,828
0106	16	G209	11/05/75	1040	1240	204,0000	4,722
0106	16	G229	11/05/75	0858	0917	236,3000	2,574
WEIGHTED AVE. = 4,412							
0106	1A	G204	11/05/75	0940	1415	467,5000	0,876

CRMC-MAD-000108

UNITS

FB/CC

TRAMMER #23 STOPE,

FB/CC

DRAWING ORE, SMALL CAVERN 700FT,

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

DRAWING ROCK DOWN FROM 500FT LEVEL, LARGE CAVERN,

FB/CC

FB/CC

SPENT 20 MIN IN BREAK ROOM,

FB/CC

FB/CC

FB/CC

DRAWING ORE, SMALL CAVERN 700FT LEVEL,

FB/CC

FB/CC

FB/CC

FB/CC

TOOK 45 MIN LUNCH BREAK,

FB/CC

DRILLER, #23 STOPE

FB/CC

TOOK LUNCH BREAK FOR 45 MIN, SPENT AFTERNOON IN LUNCH

II. LABORATORY SAMPLE RESULTS

TABLE 1

LEAD ANALYTICAL TECHNIQUE: FIREH COUNT

OPTICAL MICRO.

SAMPLE NO.	SAMPLE	DATE	TIME	TIME	VOLUME	CONC.
			HR.	MIN.	LITERS	
12	G210	11/05/75	0659	0940	467,5000	0.000
OILFIELD AVE. =		0.876				
15	G208	11/05/75	0901	1004	107,1000	8.377
15	G215	11/05/75	1004	1100	95,2000	18,152
15	G223	11/05/75	1200	1415	161,5000	5,965
15	G233	11/05/75	1104	1240	163,2000	11,068
15	G235	11/05/75	0856	0901	212,5000	7,735
EIGHTH AVE. =		9.518				
13	G122	11/04/75	1205	1300	93,5000	16,035
EIGHTH AVE. =		16.035				
14	G01	11/04/75	0719	0839	136,0000	3,630
14	G76	11/04/75	0839	1046	215,9000	2,371
14	G39	11/04/75	1046	1205	134,3000	7,532
14	G143	11/04/75	1300	1420	136,0000	4,693
EIGHTH AVE. =		4.206				
24	G04	11/03/75	1513	1755	275,4000	5,816
24	G42	11/03/75	1755	1959	210,8000	5,284
24	G43	11/03/75	1959	2129	153,0000	3,306
24	G52	11/03/75	2129	2238	117,3000	3,703
EIGHTH AVE. =		4.832				
18	G110	11/04/75	1047	1155	117,3000	0.000
15	G08	11/04/75	0731	0840	117,3000	13,243
15	G09	11/04/75	0840	0945	110,5000	5.473

CRMC-MAD-000109

UNITS

AREA,

FB/CC

TOO HIGH TO COUNT,

FB/CC

FB/CC

FB/CC

FB/CC

HIGH CONCENTRATION, ESTIMATED COUNT ONLY,

FB/CC

FB/CC

FB/CC

USUALLY MOVES AROUND OUTSIDE WEARS RESPIRATOR ALMOST
ALL THE TIME

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

TOO HIGH TO COUNT

FB/CC

CONSTANTLY MOVING THROUGHOUT THE AREA WEARS RESPIRATOR
ALL OF THE TIME

FB/CC

TABLE II. INDIVIDUAL SAMPLE RESULTS

SHEET		SAMPLE		DATE		TIME		VOLUME		CONC.	
NO.		NO.		NO.		NO.		LITERS		%	
63	15	G98	11/04/75	0905	1047	105,4000	5.941				
63	15	G136	11/04/75	1155	1335	170,0000	1.507				
63	15	G146	11/04/75	1335	1430	93,5000	2.927				
WEIGHTED AVE. = 5.554											
204	14	G190	11/07/75	0746	0905	134,3000	1.686				
WEIGHTED AVE. = 1.686											
204	13	G115	11/04/75	1040	1150	119,0000	4.776				
WEIGHTED AVE. = 4.776											
204	13	G56	11/04/75	0719	0826	113,9000	7.612				
204	13	G77	11/04/75	0826	0945	134,3000	3.848				
204	13	G103	11/04/75	0945	1040	93,5000	8.372				
204	13	G138	11/04/75	1150	1255	110,5000	8.664				
204	13	G139	11/04/75	1255	1345	85,0000	11.617				
204	13	G145	11/04/75	1350	1425	59,5000	11.030				
WEIGHTED AVE. = 7.990											
204	14	G63	11/04/75	0711	0827	129,2000	9.367				
WEIGHTED AVE. = 9.367											
204	21	G01	11/03/75	1438	1655	232,9000	1.865				
204	21	G24	11/03/75	1655	1752	96,9000	2.368				
204	21	G26	11/03/75	1752	1852	102,0000	4.632				
204	21	G38	11/03/75	1852	1958	112,2000	2.168				

UNITS

FB/CC

TOO HIGH TO COUNT

FB/CC

WORKED OUTSIDE MOVING RUSTY PIPE FOR 45 MIN.

FB/CC

OUTSIDE WORKING

FB/CC

FB/CC

FB/CC

1 RUN TO SWEEP AND BRUSH UP FOR 10 MIN. USUALLY STAYS
INSIDE WEARS RESPIRATOR MOST OF THE TIME

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

15 MIN BREAK.

FB/CC

MADE 6 CHECKS ON MACHINERY. AFTER 1900 WILL BE MAKING
SAMPLE RUNS IN ADDITION TO CHECKING MACHINERY.

FB/CC

4 RUNS TO CHECK MACHINERY, 6 MIN.

FB/CC

1 RUN TO DISENGAGE BY HAMMERING, HEAVY EXPOSURE, 2 RUNS
TO CHECK MACHINERY, 8 MIN.

FB/CC

5 RUNS, 10 MIN.

TABLE II. INDIVIDUAL SAMPLE RESULTS

SAMPLING TECHNIQUES: FIBER COUNT							
OPTICAL MICRO.							
NO.	SHEET NO.	SAMPLE NO.	DATE	TIME IN.	TIME OFF	VOLUME LITERS	CONC.
204	21	G45	11/03/75	1958	2059	103,7000	1,935
204	21	G51	11/03/75	2059	2154	93,5000	5,913
204	21	G54	11/03/75	2154	2236	71,4000	2,607
WEIGHTED AVE. =			2.654				
206	11	G114	11/04/75	1055	1200	110,5000	6,593
WEIGHTED AVE. =			6.593				
206	12	G58	11/04/75	0708	0841	158,1000	11,197
206	12	G74	11/04/75	0841	0946	110,5000	13,622
206	12	G101	11/04/75	0946	1055	117,3000	8,932
206	12	G126	11/04/75	1200	1255	93,5000	8,822
206	12	G142	11/04/75	1255	1345	85,0000	16,930
206	12	G152	11/04/75	1345	1425	68,0000	26,829
WEIGHTED AVE. =			13.301				
206	23	G03	11/03/75	1448	1648	207,4000	1,725
206	23	G22	11/03/75	1648	1748	102,0000	5,527
206	23	G27	11/03/75	1748	1850	105,4000	3,570
206	23	G40	11/03/75	1850	2005	127,5000	2,891
206	23	G48	11/03/75	2005	2105	102,0000	6,233
206	23	G50	11/03/75	2105	2155	85,0000	5,962

UNITS

FB/CC

5 RUNS, 6 MIN,

FB/CC

1 RUN TO CLEAN UP PER SHIFT, 2 SAMPLE RUNS PER SHIFT,

FB/CC

MADE 3 RUNS, 10 MIN,

FB/CC

FB/CC

1 SAMPLE RUN PER HR TAKES CARE OF SPILLS TOO USUALLY
STAYS OUTSIDE WEARS RESPIRATOR SOME OF THE TIME

FB/CC

BLEW HIMSELF OFF WITH AIR GUN

FB/CC

FB/CC

BLEW HIMSELF OFF WITH AIR GUN,

FB/CC

FB/CC

FB/CC

2 SAMPLE RUNS, FOR 5 MIN, 1 RUN PER HR, ALSO CLEANS UP 2
PILLS, ACCOUNTS FOR 2 TO 3 HRS OF TOTAL SHIFT WORK,

FB/CC

3 SAMPLE RUNS, 5 MIN,

FB/CC

2 SAMPLES RUN, 3 MIN

FB/CC

2 SAMPLE RUNS, 1 CLEAN UP, TOOK 15 MIN,

FB/CC

1 RUN TO SHEEP UP PER SHIFT, 2 SAMPLE RUNS, 15 MIN,

FB/CC

2 SAMPLE RUNS, 10 MIN

C II. INDIVIDUAL SAMPLE RESULTS

NOTE: ASBESTOS

PLE - ANALYTICAL TECHNIQUE: FIBER COUNT OPTICAL MICRO.

	SHEET	SAMPLE	DATE	TIME ON	TIME OFF	VOLUME LITERS	CONC.
10	23	G55	11/03/75	2155	2237	71,4000	3,469
WEIGHTED AVE. = 3,017							
14	14	G121	11/04/75	1040	1145	110,5000	5,394
WEIGHTED AVE. = 5,394							
18	11	G57	11/04/75	0707	0820	124,1000	14,070
20	11	G75	11/04/75	0820	0930	119,0000	7,084
24	11	G100	11/04/75	0930	1040	119,0000	5,060
25	11	G125	11/04/75	1145	1220	59,5000	29,144
26	11	G144	11/04/75	1220	1330	119,0000	6,831
27	11	G148	11/04/75	1330	1408	64,6000	23,115
28	11	G150	11/04/75	1408	1430	37,4000	15,639
WEIGHTED AVE. = 12,104							
29	22	G02	11/03/75	1444	1649	212,5000	5,979
30	22	G23	11/03/75	1649	1749	102,0000	8,441
31	22	G25	11/03/75	1749	1848	100,3000	2,610
32	22	G29	11/03/75	2008	2108	102,0000	3,472
33	22	G39	11/03/75	1848	2008	136,0000	5,844
34	22	G53	11/03/75	2155	2236	69,7000	6,170
WEIGHTED AVE. = 5,495							
35	1E	G71	11/04/75	0740	0922	173,4000	4,722

UNITS

FB/CC

3 SAMPLE RUNS, 5 MIN.

FB/CC

FB/CC

1 CLEANUP OF SPILL & SWEEP UP 1 SAMPLE RUN OUTSIDE
MUST ALL OF THE TIME WEAR RESPIRATOR MOST OF THE TIME

FB/CC

1 RUN TO CLEAN UP SPILL, DURING SAMPLE PERIOD,

FB/CC

FB/CC

USED AIR GUN ON EQUIPMENT, HEAVY EXPOSURE

FB/CC

FB/CC

FB/CC

FB/CC

MADE 2 SAMPLE RUNS 1 RUN PER HOUR

FB/CC

3 SAMPLE RUNS, 8 MIN.

FB/CC

1 SAMPLE RUN, 3 MIN.

FB/CC

1 RUN TO CLEAN UP, BLOWS THE MILLS WITH AIR GUN, ONE TIME PER SHIFT, 2 SAMPLE RUNS, 15 MIN.

FB/CC

2 SAMPLE RUNS, 5 MIN.

FB/CC

2 SAMPLE RUNS, 5 MIN.

FB/CC

WEARING RESPIRATOR.

FILE 1. INDIVIDUAL SAMPLE RESULTS

GENERAL ASSAYS

SAMPLE TEST CYCLOTORIC TECHNIQUE FIBER COUNT OPTICAL MICRO.

NO	SHEET	SAMPLE	DATE	TIME	TIME	VOLUME	CONC.
NO	NO	NO		ON	OFF	LITERS	
214	1E	G07	11/04/75	0422	1031	117,3000	5,000
219	1E	G105	11/04/75	1031	1233	207,4000	4,268

WEIGHTED AVE. = 4,767

209	1E	G07	11/04/75	0743	0909	146,2000	4,118
209	1E	G100	11/04/75	1235	1420	178,5000	5,195
209	1E	G104	11/04/75	1029	1235	214,2000	20,111

209	1E	G111	11/04/75	0909	1029	136,0000	5,091
209	1E	G127	11/04/75	1233	1417	176,6000	7,186

WEIGHTED AVE. = 9,158

209	1G	G12	11/04/75	0745	0914	151,3000	6,208
209	1G	G110	11/04/75	1030	1145	127,5000	7,414
209	1G	G112	11/04/75	0914	1030	129,2000	5,453
219	1G	G120	11/04/75	1212	1421	185,3000	3,574
209	1G	G141	11/04/75	1145	1232	79,9000	8,968

WEIGHTED AVE. = 5,894

209	17	G54	11/04/75	0711	0811	102,0000	8,087
209	17	G40	11/04/75	0911	1011	102,0000	9,681
219	17	G47	11/04/75	1011	1111	102,0000	13,872
209	17	G93	11/04/75	0811	0911	102,0000	7,733
209	17	G124	11/04/75	1111	1230	134,3000	5,066
209	17	G131	11/04/75	1230	1330	102,0000	7,202
219	17	G103	11/04/75	1330	1427	96,9000	4,930

WEIGHTED AVE. = 7,972

UNITS

FB/CC

FB/CC

CHANGED FROM NYTAL 100 TO CERAMATAI, HPT AT 11115, TOOK
30 MIN LUNCH BREAK,

FB/CC

WEARING RESPIRATOR

FB/CC

FB/CC

CHANGED FROM NYTAL 100 TO CERAMATALC HDTAT 11115, TOOK
30 MIN LUNCH BREAK,

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

TOOK 30 MIN LUNCH BREAK,

FB/CC

15 MIN BREAK AT 8115, 45 MIN LUNCH AT 11145,

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

11. INDIVIDUAL SAMPLE RESULTS

AT: 45-25703

PLE METROLOGICAL ANALYTICAL TECHNIQUE: FIFER COUNT OPTICAL MICRO,

	SUBST	SAMPLE	DATE	TIME ON	TIME OFF	VOLUME LITERS	CONC.
14		G14	11/04/75	1027	1136	117,3000	9,291
14		G14	11/04/75	0929	1027	98,8000	9,039
15		G15	11/04/75	0827	1027	204,0000	1,181
14		G130	11/04/75	1240	1340	102,0000	7,792
15		G133	11/04/75	1136	1240	108,8000	6,088
15		G157	11/04/75	1340	1426	78,2000	9,394
WEIGHTED AVE. = 6,220							
14		G60	11/04/75	0714	0811	96,9000	6,649
19		G61	11/04/75	0914	1014	102,0000	3,011
19		G90	11/04/75	1014	1114	102,0000	6,434
19		G92	11/04/75	0812	0914	105,4000	3,808
19		G123	11/04/75	1114	1237	141,1000	5,334
19		G129	11/04/75	1237	1337	102,0000	5,903
19		G133	11/04/75	1337	1429	88,4000	12,941
WEIGHTED AVE. = 6,110							
20		G06	11/03/75	1520	1047	1983,9000	0,202
WEIGHTED AVE. = 0,202							
27		G19	11/03/75	1647	1906	236,3000	4,306
27		G35	11/03/75	1906	2016	119,0000	6,780
27		G44	11/03/75	2141	2248	113,9000	3,420
27		G47	11/03/75	2016	2141	144,5000	3,237
WEIGHTED AVE. = 4,370							
28		G08	11/03/75	1526	1648	139,4000	2,400
28		G12	11/03/75	1648	1856	217,6000	7,499

CRMC-MAD-000114

UNITS

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

15 MIN BREAK, 45 MIN LUNCH

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

TOOK COFFEE BREAK,

FB/CC

FB/CC

FB/CC

TOOK 15 MIN COFFEE BREAK,

FB/CC

BAG BURST AT 1600 HRS.

FB/CC

TABLE II. INDIVIDUAL SAMPLE RESULTS

TABLE II. INDIVIDUAL SAMPLE RESULTS

ANALYTICAL TECHNIQUE		FIBER COUNT		OPTICAL MICRO.	
SAMPLE	DATE	TIME	TIME	VOLUME	CONC.
NO.	NO.	ON	OFF	LITERS	
24	11/03/75	2130	2229	100.3000	15.908
24	11/03/75	2005	2130	140.5000	10.063
24	11/03/75	2229	2253	40.8000	20.956
WEIGHTED AVE. = 9.130					
29	11/03/75	1520	1647	147.9000	3.016
29	11/03/75	1645	1904	236.3000	6.013
29	11/03/75	1904	2012	115.6000	6.354
29	11/03/75	2144	2250	112.2000	6.037
29	11/03/75	2012	2144	156.4000	3.080
WEIGHTED AVE. = 4.894					
11	11/04/75	0730	0832	105.4000	5.713
11	11/04/75	0435	1033	612.0000	1.604
11	11/04/75	1033	1130	110.5000	6.430
11	11/04/75	0832	0932	102.0000	7.438
11	11/04/75	1140	1230	85.0000	6.288
11	11/04/75	1232	1332	102.0000	7.585
11	11/04/75	1332	1428	95.2000	5.515
WEIGHTED AVE. = 4.171					
21	11/03/75	1525	1654	151.3000	4.218
21	11/03/75	1858	2031	158.1000	2.176
21	11/03/75	1654	1858	210.8000	3.142
21	11/03/75	2031	2252	239.7000	1.812

CRMC-MAD-000115

UNITS

FB/CC

BAG BURST AT 2225

FB/CC

TOOK 15 MIN COFFEE BREAK, CLEANED HIMSELF WITH COMPRESS
ED AIR, BAG BURST 2125.

FB/CC

FB/CC

FB/CC

TOOK DINNER BREAK 30 MIN

FB/CC

FB/CC

FB/CC

TOOK 15 MIN. COFFEE BREAK,

FB/CC

--15 MIN BREAK,

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

TOOK DINNER BREAK, 30MIN.

FB/CC

TOOK 15 MIN COFFEE BREAK,

E II. INDIVIDUAL SAMPLE RESULTS

MT: ASBESTOS

PL: METHOXANALYTICAL TECHNIQUE: FIBER COUNT OPTICAL MICRO.

	SHEET	SAMPLE	DATE	TIME ON	TIME OFF	VOLUME LITERS	CONC.
WEIGHTED AVE. = 2.736							
12	11	G7H	11/04/75	0810	1007	198,9000	1,911
12	11	G113	11/04/75	1007	1428	443,7000	1,588
WEIGHTED AVE. = 1.688							
12	25	G05	11/03/75	1521	1816	297,5000	1,079
12	25	G16	11/03/75	1816	2030	227,8000	1,859
12	25	G41	11/03/75	2030	2300	255,0000	1,015
WEIGHTED AVE. = 1.286							
13	14	G65	11/04/75	0715	0830	127,5000	5,478
13	14	G80	11/04/75	0930	1030	102,0000	4,722
13	14	G88	11/04/75	0830	0930	102,0000	5,420
13	14	G91	11/04/75	1030	1137	113,9000	6,284
13	14	G128	11/04/75	1235	1335	102,0000	7,261
13	14	G132	11/04/75	1137	1235	98,6000	4,614
13	14	G157	11/04/75	1335	1424	83,3000	6,592
WEIGHTED AVE. = 5,750							
13	10	G62	11/04/75	0737	0911	159,8000	3,135
13	10	G83	11/04/75	0911	1101	187,0000	1,146
13	10	G118	11/04/75	1101	1237	163,2000	1,653
13	10	G119	11/04/75	1237	1421	176,8000	2,598
WEIGHTED AVE. = 2.103							
13	26	G09	11/03/75	1521	1700	168,3000	2,581
13	26	G18	11/03/75	1700	1953	294,1000	3,340

CRMC-MAD-000116

UNITS

FR/CC

FR/CC

TOOK 30 MIN LUNCH BREAK.

FR/CC

WENT TO #3 HILL DURING SAMPLE FOR 10 MIN.

FR/CC

FR/CC

TOOK 15 MIN BREAK.

FR/CC

15 MIN BREAK.

FR/CC

FR/CC

FR/CC

FR/CC

FR/CC

FR/CC

FR/CC

FR/CC

FR/CC

CHANGED FROM NYTAL 100 TO CERMATALC HOT AT 1115 TOOK
30 MIN LUNCH BREAK

FR/CC

FR/CC

PACKING NYTAL 200 UNTIL 6100PH, THEN NYTAL 300.

FR/CC

TABLE II. INDIVIDUAL SAMPLE RESULTS

SAMPLE IDENTIFICATION		ANALYTICAL TECHNIQUE		FIBER COUNT		OPTICAL MICRO,	
DATE	SHEET NO.	SAMPLE NO.	DATE	TIME ON	TIME OFF	VOLUME LITERS	CONC.
11/03/75	26	G30	11/03/75	1953	2150	196,9000	3,814
11/03/75	26	G31	11/03/75	2150	2247	96,9000	8,264
WEIGHTED AVE. = 3.925							
11/04/75	10	G70	11/04/75	0734	0918	176,8000	1,336
11/04/75	10	G102	11/04/75	0918	1044	146,2000	5,354
11/04/75	10	G10A	11/04/75	1044	1337	294,1000	2,938
11/04/75	10	G151	11/04/75	1337	1429	88,4000	5,558
WEIGHTED AVE. = 3.365							
11/04/75	14	G74	11/04/75	0955	0926	154,7000	1,573
11/04/75	14	G42	11/04/75	0926	1245	338,3000	2,367
11/04/75	14	G106	11/04/75	1245	1413	149,6000	1,750
WEIGHTED AVE. = 2.032							
11/05/75	14	G164	11/05/75	1241	1455	227,8000	4,414
11/05/75	14	G203	11/05/75	1148	1241	158,1000	3,736
11/05/75	14	G227	11/05/75	0741	1108	419,9000	1,195
WEIGHTED AVE. = 2.674							
11/05/75	14	G234	11/05/75	0655	0904	219,3000	0,763
WEIGHTED AVE. = 0,763							
11/05/75	10	G205	11/05/75	1110	1457	385,9000	1,447
11/05/75	10	G231	11/05/75	0742	1112	425,0000	1,269
WEIGHTED AVE. = 1,354							
11/05/75	14	G141	11/05/75	1410	1455	76,5000	3,878

CRMC-MAD-000117

UNITS

TOOK DINNER BREAK.

FB/CC

TOOK 15 MIN COFFEE BREAK.

FB/CC

FB/CC

FB/CC

HAND SWEEPING DUST FROM BROKEN BAGS DURING SURVEY.

FB/CC

TOOK 30 MIN LUNCH BREAK.

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

WORKING AT SHAFT STATION, TOOK LUNCH BREAK FOR 30 MIN.

FB/CC

MAINTENANCE AT SHAFT STATION.

FB/CC

REPAIRING SLUSHER, 4FH RAMP.

FB/CC

TOOK 30 MIN LUNCH BREAK.

FB/CC

MAINTENANCE AT SHAFT STATION.

FB/CC

E II. INDIVIDUAL SAMPLE RESULTS

TEST: ASH: 31.15

TEST METHOD: ANALYTICAL TECHNIQUE: FIBER COUNT OPTICAL MICRO.

	SHIFT	SAMPLE	DATE	TIME	TIME	VOLUME	CONC.
E	MAN. NO.	NO.		ON	OFF	LITERS	
4	18	G187	11/05/75	1324	1410	78,2000	1.063
4	18	G200	11/05/75	1021	1137	129,2000	2.716
4	18	G210	11/05/75	1137	1324	181,9000	2.786
WEIGHTED AVE. = 2.657							
4	13	G178	11/05/75	1325	1455	153,0000	2.361
4	13	G197	11/05/75	0904	0959	93,5000	2.323
4	13	G201	11/05/75	0959	1147	183,6000	2.454
4	13	G212	11/05/75	1147	1325	166,6000	0.239
4	13	G239	11/05/75	0654	0904	221,0000	1.112
WEIGHTED AVE. = 1.608							
01	18	G164	11/07/75	1132	1324	190,4000	2.580
01	18	G166	11/07/75	0715	0952	266,9000	0.916
WEIGHTED AVE. = 1.609							
01	10	G171	11/07/75	1133	1324	266,9000	0.000
01	10	G238	11/07/75	0955	1133	266,9000	0.000
01	10	G150	11/07/75	0723	0955	258,4000	2.346
WEIGHTED AVE. = 2.346							
02	16	G161	11/07/75	0900	0937	62,9000	3.025
02	16	G162	11/07/75	0729	0900	154,7000	2.912
02	16	G166	11/07/75	0937	1130	192,1000	2.299
02	16	G176	11/07/75	1131	1325	193,8000	1.218
WEIGHTED AVE. = 2.165							
02	14	G143	11/07/75	1145	1300	127,5000	3.148
02	14	G184	11/07/75	0905	1145	272,0000	4.029

UNITS

FB/CC

FB/CC

FB/CC

MAINT. AT 4PM RAMP, TOOK LUNCH BREAK, 45 MIN.

FB/CC

FB/CC

FB/CC

FB/CC

MAINTENANCE AT SLUSHER 4PM RAMP-TOOK LUNCH BREAK AT
1130-1215

FB/CC

MAINTENANCE REPAIRING SLUSHER 4PM RAMP.

FB/CC

FB/CC

FB/CC

TOO HIGH TO COUNT.

FB/CC

TOO HIGH TO COUNT.

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

TABLE II. INDIVIDUAL SAMPLE RESULTS

ANALYTICAL TECHNIQUE: FIBER COUNT

OPTICAL MICRO,

DATE	SHEET	SAMPLE	DATE	TIME (ON)	TIME (OFF)	VOLUME LITERS	CONC.
WEIGHTED AVE. = 3.748							
11/07/75	1A	G165	11/07/75	1133	1324	188.7000	0.542
11/07/75	1A	G174	11/07/75	0951	1133	173.4000	0.285
11/07/75	1A	G180	11/07/75	0712	0951	270.3000	3.586
WEIGHTED AVE. = 1.773							
11/07/75	1E	G173	11/07/75	1134	1324	270.3000	0.000
11/07/75	1E	G177	11/07/75	0725	0954	253.3000	0.677
11/07/75	1E	G182	11/07/75	0954	1134	170.0000	8.855
WEIGHTED AVE. = 3.961							
11/07/75	1C	G172	11/07/75	0950	1134	176.8000	2.197
11/07/75	1C	G191	11/07/75	0718	0950	250.4000	1.235
11/07/75	1C	G192	11/07/75	1135	1324	185.3000	1.913
WEIGHTED AVE. = 1.712							
11/04/75	16	G64	11/04/75	0707	0958	290.7000	4.453
11/04/75	16	G197	11/04/75	0958	1142	176.8000	4.019
11/04/75	16	G137	11/04/75	1142	1342	204.0000	4.339
11/04/75	16	G147	11/04/75	1342	1427	76.5000	1.656
WEIGHTED AVE. = 4.033							
11/07/75	1F	G154	11/07/75	0727	0957	255.0000	1.574
11/07/75	1F	G176	11/07/75	0957	1152	195.5000	3.141
11/07/75	1F	G185	11/07/75	1152	1324	156.4000	0.751
WEIGHTED AVE. = 1.867							

CRMC-MAD-000119

UNITS

FB/CC

FB/CC

FB/CC

FB/CC

TOO HIGH TO COUNT,

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

FB/CC

HIGH CONC. ESTIMATED CONC. ONLY

FB/CC

FB/CC

WORKER TURNED OFF PUMP DURING 30 MIN FOR LUNCH,

LE13. INDIVIDUAL SAMPLE RESULTS

SITE: ASBESTOS

SAMPLE METHOD/ANALYTICAL TECHNIQUE: FIBER COUNT / ELECTRON MICRO,

IN	SHEET	SAMPLE	DATE	TIME	TIME	VOLUME	CONC.
DE	MAILED	NO.		ON	OFF	LITERS	
03	10	G194	11/05/75	1144	1340	197,2000	20,152
E-WEIGHTED AVE. = 20,152							
03	17	G156	11/05/75	1240	1455	229,5000	22,563
E-WEIGHTED AVE. = 22,563							
03	19	G149	11/05/75	1325	1415	85,0000	13,223
03	19	G237	11/05/75	0700	0832	156,4000	8,855
E-WEIGHTED AVE. = 10,393							
06	18	G240	11/05/75	0659	0940	273,7000	9,460
E-WEIGHTED AVE. = 9,460							
15	15	G223	11/05/75	1240	1415	161,5000	17,523
E-WEIGHTED AVE. = 17,523							
201	24	G04	11/03/75	1513	1755	275,4000	18,365
201	24	G42	11/03/75	1755	1959	210,8000	33,705
E-WEIGHTED AVE. = 25,016							
203	15	G98	11/04/75	0945	1047	105,4000	36,561
203	15	G146	11/04/75	1335	1430	93,5000	9,016
E-WEIGHTED AVE. = 23,612							
204	13	G77	11/04/75	0836	0945	134,3000	8,967
E-WEIGHTED AVE. = 8,967							
204	21	G38	11/03/75	1852	1958	112,2000	15,563
E-WEIGHTED AVE. = 15,563							
206	12	G101	11/04/75	0946	1055	117,3000	102,662
E-WEIGHTED AVE. = 102,662							
206	23	G22	11/03/75	1648	1748	102,0000	33,647
E-WEIGHTED AVE. = 33,647							

CRMC-MAD-000120

UNITS

FB/CC

TRAMMING 23 SLOPE TOOK LUNCH BREAK 1130-1215,

FB/CC

FB/CC

SPENT 20 MIN IN BREAK ROOM,

FB/CC

DAGGING ORE, SMALL CAVERN 700 FT LEVEL.

FB/CC

TOO HIGH TO COUNT,

FB/CC

FB/CC

FB/CC

FB/CC

TOO HIGH TO COUNT,

FB/CC

OUTSIDE WORKING

FB/CC

FB/CC

5 RUNS, 10 MIN,

FB/CC

FB/CC

3 SAMPLE RUNS, 5 MIN,

3. INDIVIDUAL SAMPLE RESULTS

PAGE : 40

ASBESTOS

ANALYTICAL TECHNIQUE: FIBER COUNT / ELECTRON MICRO.

SHEET NO.	SAMPLE NO.	DATE	TIME ON	TIME OFF	VOLUME LITERS	CONC.	UNITS
11	G144	11/04/75	1220	1330	119,0000	18,215	FB/CC
EIGHTED AVE. = 18,215							
22	G002	11/03/75	1044	1049	212,5000	25,501	FB/CC
EIGHTED AVE. = 25,501							
14	G96	11/04/75	0827	1027	204,0000	31,877	FB/CC
EIGHTED AVE. = 31,877							
27	G47	11/03/75	2016	2141	144,5000	41,752	FB/CC
EIGHTED AVE. = 41,752							
14	G45	11/04/75	0433	1033	612,0000	7,280	FB/CC
EIGHTED AVE. = 7,280							
24	G10	11/03/75	1525	1654	151,3000	26,663	FB/CC
EIGHTED AVE. = 26,663							
11	G113	11/04/75	1007	1428	443,7000	13,570	FB/CC
EIGHTED AVE. = 13,570							
25	G05	11/03/75	1521	1810	297,5000	16,191	FB/CC
EIGHTED AVE. = 16,191							
26	G31	11/03/75	2150	2247	96,9000	36,040	FB/CC
EIGHTED AVE. = 36,040							
13	G197	11/05/75	0904	0959	93,5000	16,743	FB/CC
EIGHTED AVE. = 16,743							
14	G140	11/07/75	0712	0951	270,3000	24,949	FB/CC
EIGHTED AVE. = 24,949							
14	G176	11/07/75	0957	1152	195,5000	9,856	FB/CC
EIGHTED AVE. = 9,856							

MADE 2 SAMPLE RUNS 1 RUN PER HOUR

TOOK 15 MIN COFFEE BREAK.

TOOK 30 MIN LUNCH BREAK.

WENT TO #3 HILL DURING SAMPLE FOR 10 MIN.

SAMPLE WAS DELETED FROM THE STATISTICAL RESULTS (TABLE 4) AND THE TIME WEIGHTED AVERAGES

13. STATISTICS

TE ASBESTOS
LE METHOD/OPTICAL TECHNIQUE FIBER COUNT (OPTICAL MICRO)

JOB	NO. OF	RANGE FB/CC	MEAN	MEDIAN	T.W.	STANDARD
CITY	SAMPLES	(HI-LOW)	FB/CC	FB/CC	AVE.	DEVIATION
0102	004	014,673-007,714	10,250	9,307	9,792	3,063
0103	025	014,599-002,309	6,413	5,079	5,575	3,544
0105	005	006,628-000,476	3,929	4,644	3,011	2,275
0115	005	014,152-005,905	10,259	8,377	9,518	4,778

APEA						
01	039	014,152-000,076	6,982	6,504		3,949
0201	004	010,033-002,371	5,819	4,673	5,305	4,128
0203	005	013,243-001,507	5,818	5,473	5,554	4,533
0204	016	011,617-001,086	5,529	4,704	5,074	3,460
0206	010	020,829-001,725	6,736	6,413	7,901	6,743
0208	012	027,144-002,019	9,918	6,501	8,393	7,838
0209	004	020,936-000,202	6,892	6,063	5,073	4,174
0211	011	000,236-001,004	4,902	5,515	3,618	2,447
0212	005	001,911-001,015	1,490	1,588	1,467	0,424
0213	015	004,204-001,106	4,460	4,614	3,962	2,096
0214	004	005,550-001,336	3,797	4,140	3,365	2,026
0220	003	002,307-001,573	1,897	1,750	2,032	0,417

APEA						
02	144	029,144-000,202	6,327	5,476		4,810
030	003	004,414-001,195	3,115	3,736	2,604	1,697
030	012	003,874-000,239	1,868	1,885	1,650	1,046

APEA						
03	015	004,414-000,239	2,117	2,323		1,240
0401	003	002,580-000,916	1,947	2,306	1,875	0,901
0402	005	004,029-001,218	2,772	2,969	2,807	0,943
0403	003	003,566-000,245	1,471	0,542	1,773	1,836
0405	002	004,855-000,677	4,766	4,766	3,961	5,783
0406	003	002,197-001,235	1,782	1,913	1,712	0,494
0410	004	004,453-001,656	3,617	4,179	4,033	1,320
0411	003	003,141-000,751	1,822	1,574	1,867	1,214

APEA						
04	024	000,855-000,245	2,571	2,323		1,836

PLANT TOTAL						
252	029,144-000,202	5,751	4,722			4,536

STANDARD	JOB TITLE
1,531	CRUSHER OPERATOR
0,709	TRAMMER
1,017	DRILLER
2,137	CAGEMAN

0,632

1,376	MILL FOREMAN
2,027	GENERAL LABORER
0,865	CRUSHER OPERATOR
1,402	HANDING OPERATOR
2,095	WHEELER OPERATOR
0,602	PACKER
0,738	PACKER SERVICEMAN
0,189	PACKHOUSE FOREMAN
0,541	FORK LIFT OPERATOR/TOW MOTOR-OPER.
1,013	CAR LINER
0,241	BULK CAR LOADER

0,401

0,980	BLACKSMITH
0,302	MAINTENANCE MECHANIC

0,320

0,520	MILLWRIGHT
0,385	INSTRUMENT REPAIRMAN
1,060	MACHINIST
4,089	MILLWRIGHT HELPER
0,285	SHEET METAL WORKER
0,660	OILER
0,701	WELDER

0,375

0,304

14. STATISTICS

ATI ASBESTOS

PLE MET/ANALYTICAL TECHNIQUE: FIBER COUNT / SELECTION MICRO.

JOB	NO. OF	NAMES FR/CC	MEAN	MEDIAN	T.O.	STANDARD	STANDARD
CORE	SAMPLES	(N-1) (N)	FR/CC	FR/CC	AVE.	DEVIATION	ERROR
0103	004	022,503-008,855	16,198	16,688	17,454	6,296	3,148
0106	001	009,460-009,460	9,460	9,460	9,460	0.000	0.000
0115	001	017,523-017,523	17,523	17,523	17,523	0.000	0.000

AMEZ

01	000	022,503-008,855	15,246	15,373		5,678	2,318
0201	002	033,705-010,305	20,035	23,035	25,016	10,847	7,670
0203	002	030,501-009,010	22,789	22,789	23,612	19,477	13,772
0204	002	015,503-008,467	12,205	12,205	11,969	4,664	3,298
0206	002	102,002-033,047	68,155	68,155	70,502	48,801	34,507
0208	002	025,501-010,215	21,858	21,858	22,806	5,152	3,643
0209	002	041,752-031,077	36,815	36,815	35,972	6,983	4,937
0211	002	020,003-017,200	16,972	16,972	11,122	13,706	9,691
0212	002	010,191-013,570	14,881	14,881	14,622	1,853	1,310
0213	001	030,040-030,040	30,040	30,040	30,040	0.000	0.000

AMEZ

02	017	102,002-007,280	27,975	25,501		22,124	5,366
0304	001	010,743-010,743	10,743	10,743	10,743	0.000	0.000

AMEZ

03	001	010,743-010,743	10,743	10,743		0.000	0.000
0403	001	024,949-024,949	24,949	24,949	24,949	0.000	0.000
0411	001	009,856-009,856	9,856	9,856	9,856	0.000	0.000

AMEZ

04	002	024,949-009,856	17,403	17,403		10,672	7,546
----	-----	-----------------	--------	--------	--	--------	-------

PLANT TOTAL

026	102,662-007,280	23,804	18,290		18,941	3,715
-----	-----------------	--------	--------	--	--------	-------

END OF REPORT

CRMC-MAD-000123

JOB TITLE

TRAMMER
DRILLER
CAGEMAN

HILL FOREMAN
GENERAL LABORER
CRUISHER OPERATOR
HARDINGE OPERATOR
WHEELER OPERATOR
PACKER
PACKER SERVICEMAN
PACKHOUSE FOREMAN
FORK LIFT OPERATOR/TOW MOTOR OPER.

MAINTENANCE MECHANIC

MACHINIST
WELDER

FINAL REPORT

INDUSTRIAL HYGIENE STUDY OF THE GOUVERNEUR
TALC COMPANY, NUMBER ONE MINE AND MILL

Balmat, New York

Volume II
Talc Bulk Sample Analyses
By NIOSH, W.C. McCrone and
Mt. Sinai School of Medicine

Department of Health, Education, and Welfare
Center for Disease Control
National Institute for Occupational Safety and Health
Division of Surveillance, Hazard Evaluations and Field Studies
Cincinnati, Ohio

CRMC-MAD-000124

Electron Microscopic Analyses of R.T.
Vanderbilt Talc Collected from
Talc Suppliers

Analyses Performed By

John M. Dement
Ralph D. Zumwalde

Date
October, 1976

Department of Health, Education, and Welfare
Center for Disease Control
National Institute for Occupational Safety and Health
Division of Surveillance, Hazard Evaluations and Field Studies
Cincinnati, Ohio

CRMC-MAD-000125

INTRODUCTION

As a part of ongoing research by the National Institute for Occupational Safety and Health (NIOSH) concerning health effects of occupational exposures to talc and as requested by the Occupational Safety and Health Administration, seven bulk talcs produced by the R.T. Vanderbilt were analyzed for asbestos content. These talcs were obtained from independent talc suppliers and have been "certified" by Vanderbilt not to contain asbestos. Samples were analysed for asbestos content by analytical electron microscopy. The following paragraphs describe sample preparation and analytical methods employed along with results.

METHODS

Given in Table 1 are descriptive data for the 7 tales obtained and analyzed including source and NIOSH sample number assigned.

Samples for transmission electron microscopic analyses were prepared by dispersing the powder samples in ethyl acetate by ultrasoneration. Approximately 10 mg of each powder was placed in 10-20 ml. of ethyl acetate followed by vigorous ultrasoneration for 10-15 minutes using a cell disrupter. Samples were prepared using a micro capillary tube to place a drop of the solution onto 200 mesh Formvar/carbon substrate copper electron microscope grids. The ethyl acetate was allowed to evaporate in a laboratory clean hood. If necessary, an additional drop of the solution was used to insure sufficient material for efficient analysis by electron microscopy. Blank grids were prepared in the same manner as the samples.

Samples were analyzed by first scanning the entire grid at low magnification to ascertain the suitability of the preparation for analysis. At a magnification of approximately 17,000X, all particles with an aspect ratio (length to diameter) of 3 to 1 or greater were identified using both selected area electron diffraction and energy dispersive microchemical analysis for fiber identification. A total of 25 to 50 individual fibers were so analyzed for each sample. A JEOL, JEM 100B transmission/scanning electron microscope equipped with an EDAX energy dispersive x-ray analyzer was used for all analyses. Electron micrographs of typical fibers along with their diffraction patterns and x-ray spectrum were recorded for each sample.

Table 1

Sources of R.T. Vanderbilt Talc Produced at
the Gouverneur Talc Company, Number One Mine
and Mill and Obtained from Suppliers

Product Name	Source	NIOSH #
Nytal 300	Crone Chemical P.O. Box 14042 Houston, Texas 77021	001
Nytal 400		002
5X	Paul Crazier Company 1115 Silver St. Houston, Texas 77007	003
325		004
X		005
FT		006
3X		007

RESULTS AND DISCUSSION

Results of all analyses are shown in Table 2 and typical micrographs of fibers in these samples along with electron diffraction patterns and x-ray spectra are shown in the Appendix. Based on their selected area electron diffraction patterns, fibers were classified as positive amphiboles, positive chrysotile, non-asbestos or "ambiguous" meaning that the pattern was not sufficiently clear for positive identification. The energy dispersive x-ray spectra were used to classify the amphiboles as to type and for further confirmation of chrysotile identification by electron diffraction.

As shown in Table 2, results of these analyses show all talcs analyzed to be of essentially the same fiber composition. The major fiber component is asbestiform anthophyllite, ranging from 67 to 88% of the fibers present in addition to fibrous tremolite (4 to 12%). Aspect ratios for these fibers ranged up to 1000 to 1, with the longer, thinner fibers being anthophyllite. Trace quantities of chrysotile were found in two of the samples. Chrysotile fibers observed were small in diameter ($< 0.1 \mu\text{m}$) and short in length (most $< 1.0 \mu\text{m}$).

Table 2

Summary of NIOSH Electron Microscopic
Analyses of Talc Produced at the
Gouverneur Talc Company
Number One Mine and Mill
Samples Obtained From Talc Suppliers

Talc Sample	Range of Fiber Aspect Ratios	Fiber Identification (Percent)				
		Positive Amphiboles		Positive Chrysotile	Non Asbestos	Not* Identified
		Tremolite	Anthophyllite			
Pyral 400	3/1 to 1000/1	8	88	N.D.	4	---
Pyral 300	3/1 to 100/1	12	72	N.D.	4	12
5X	5/1 to 100/1	11	80	Trace	4	5
X	8/1 to 80/1	6	80	N.D.	2	12
3X	5/1 to 100/1	12	67	N.D.	4	16
1F	3/1 to 50/1	16	72	N D.	4	8
325	3/1 to 50/1	4	88	Trace	7	---

* Selected area diffraction patterns not sufficient for positive identification

ND - None Detected

CRMC-MAD-000130

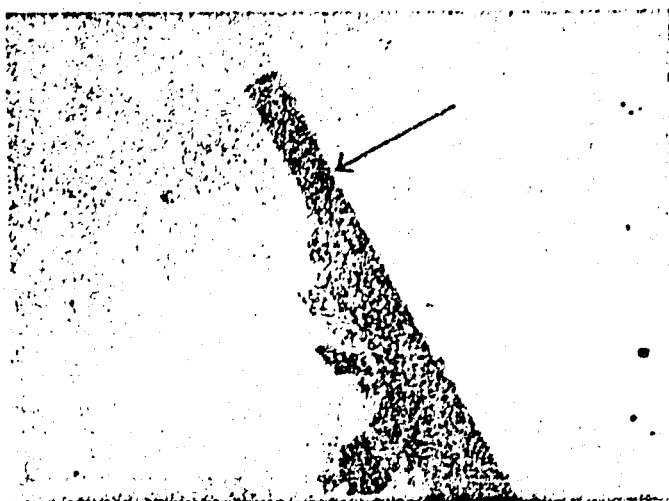
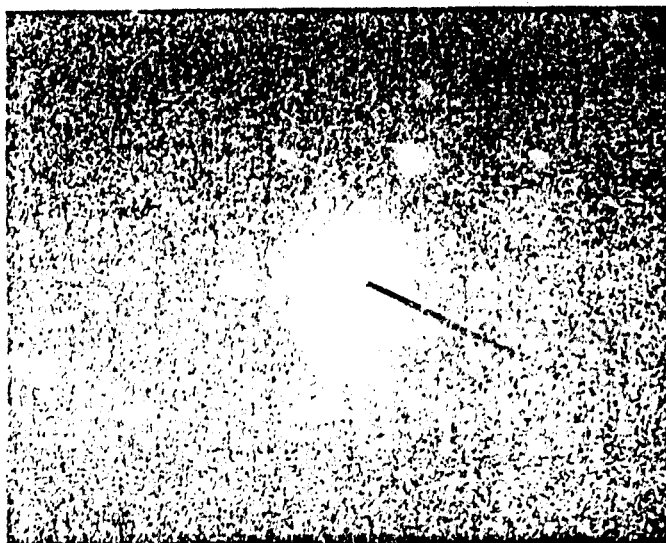
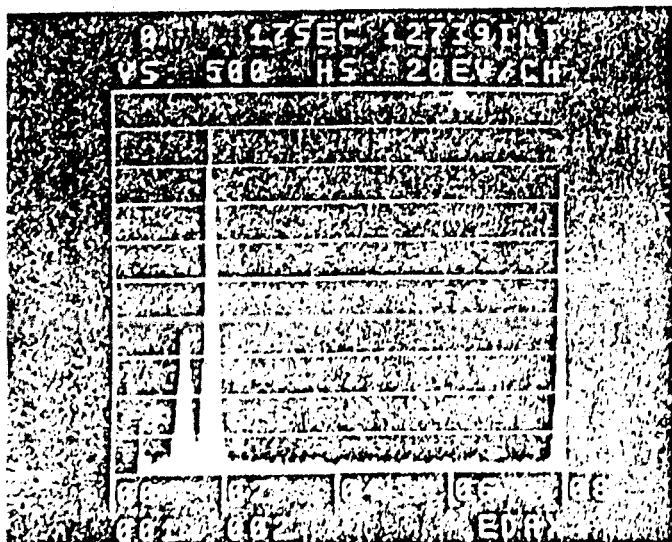
CONCLUSIONS

Using present "state-of-the art" techniques for asbestos fiber analyses, all 7 talcs analyzed demonstrated large quantities of asbestiform tremolite and anthophyllite to present. Only trace quantities of chrysotile were detected in 2 of the 7 talcs. Based on these analyses, all talcs analyzed should be labeled with the OSHA asbestos warning label.

APPENDIX

Electron Micrographs, Electron Diffraction Patterns and
X-Ray Spectra for Typical Fibers in R.T. Vanderbilt Talcs.

SAMPLE 001



Magnification
10,000 X

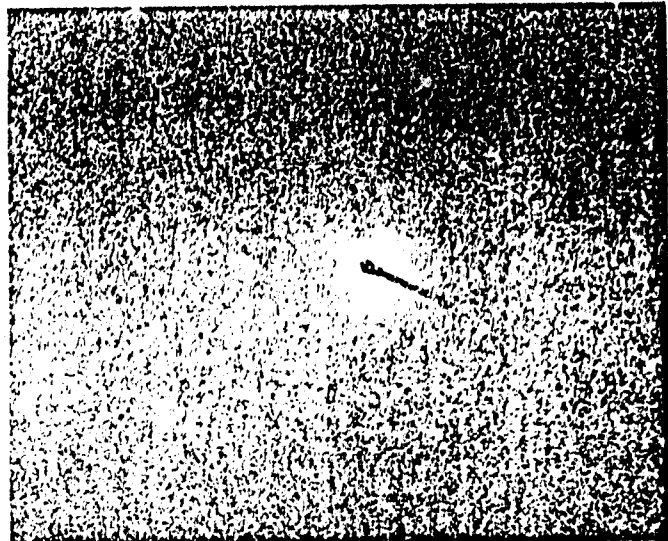
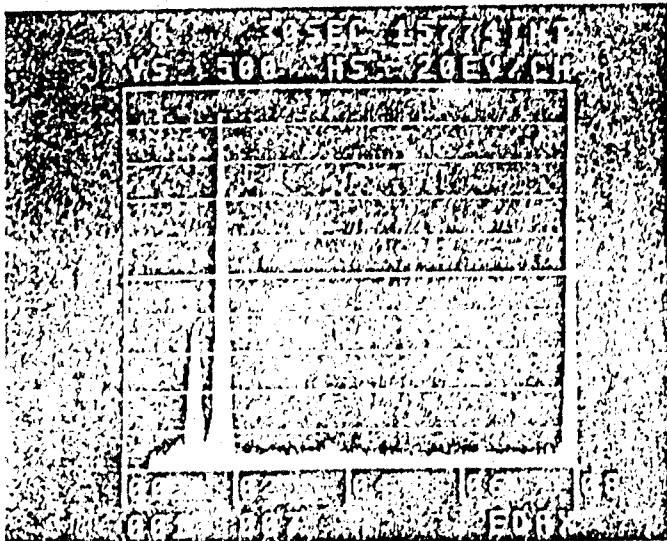
1 Micron

Magnification
1,700 X

10 Micron

CRMC-MAD-000133

SAMPLE 001



Magnification
1,700 X

10 Micron ———

CRMC-MAD-000134

SAMPLE 1



MAGNIFICATION 3,000 X
1 MICRON —
10 MICRON —

CRMC-MAD-000135

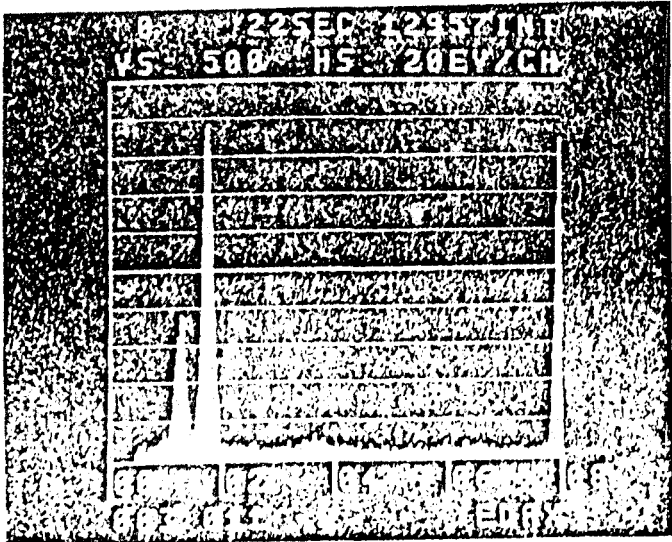
SAMPLE 11



MAGNIFICATION 3,000 X
1 MICRON —
10 MICRON

CRMC-MAD-000136

SAMPLE : 003.



Magnification
10,000 X

1 Micron

Magnification
5,000 X

1 Micron

CRMC-MAD-000140

SAMPLE 3



MAGNIFICATION 3,000 X
1 MICRON --
10 MICRON _____

CRMC-MAD-000142

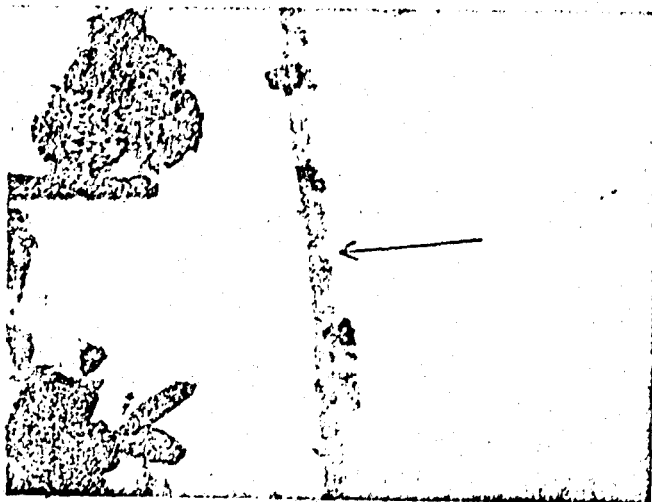
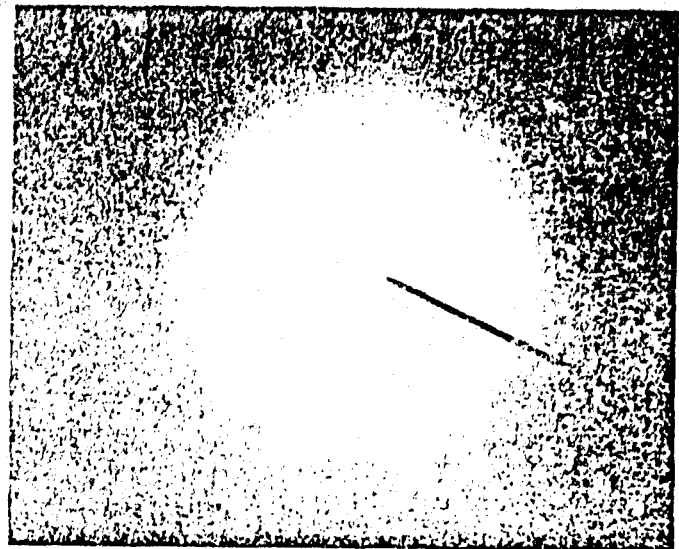
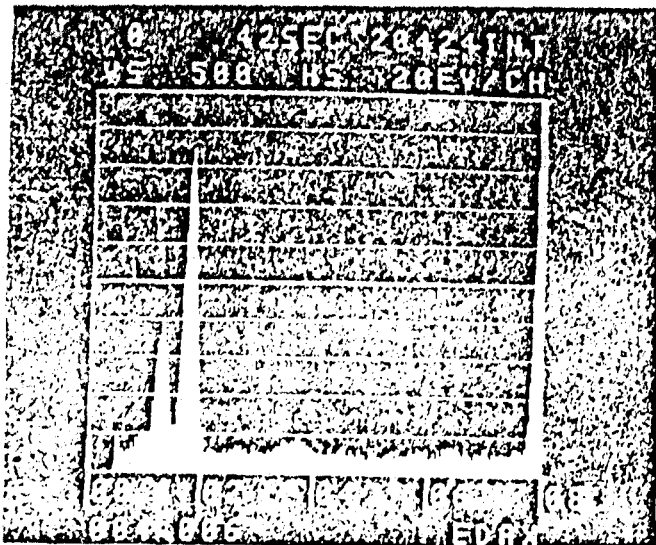
SAMPLE 3



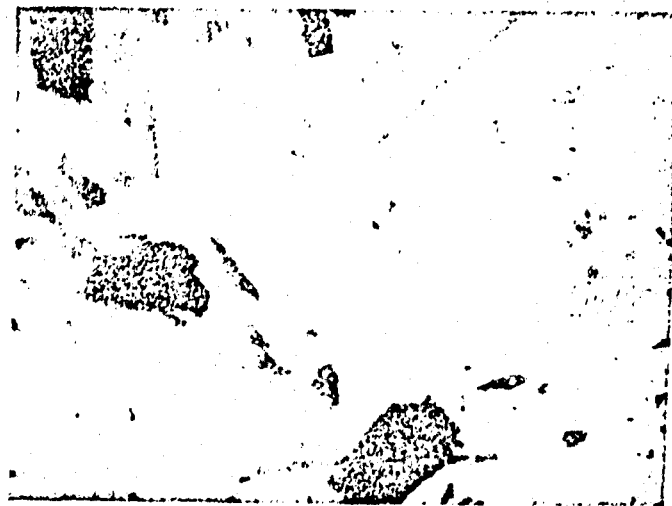
MAGNIFICATION 3,000 X
1 MICRON -
10 MICRON —————

CRMC-MAD-000143

SAMPLE 004



Magnification
 10,000 X 1 Micron



Magnification
 1,700 X 10 Micron

CRMC-MAD-000147

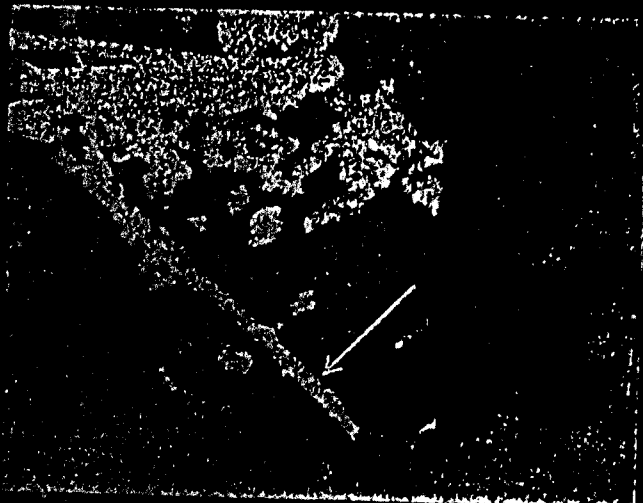
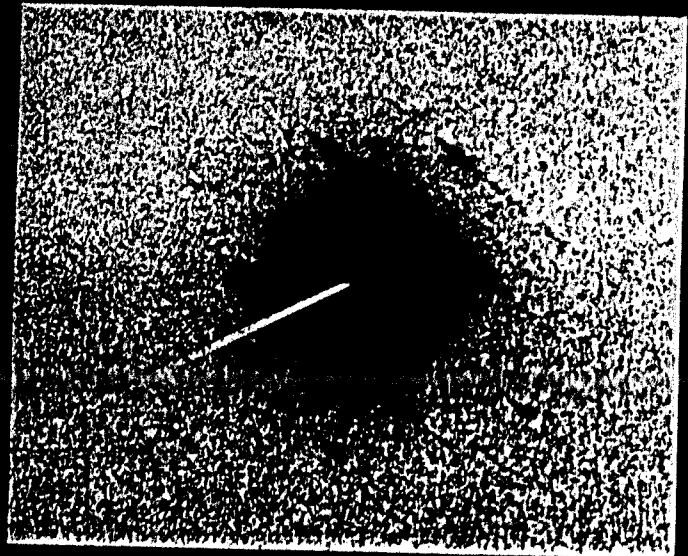
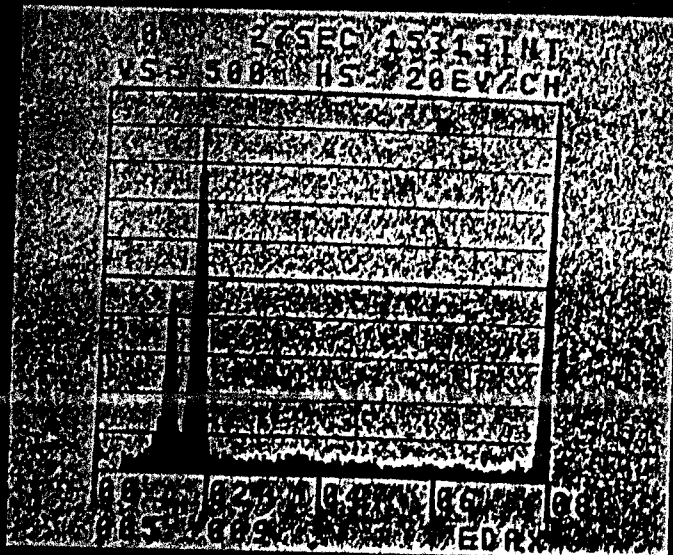
SAMPLE 004



MAGNIFICATION 3,000 X
1 MICRON —
10 MICRON —

CRMC-MAD-000149

SAMPLE 005



Magnification
 10,000 X

1 Micron



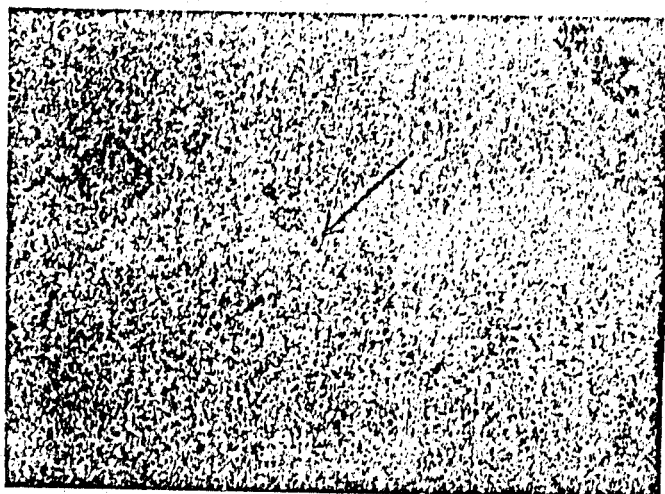
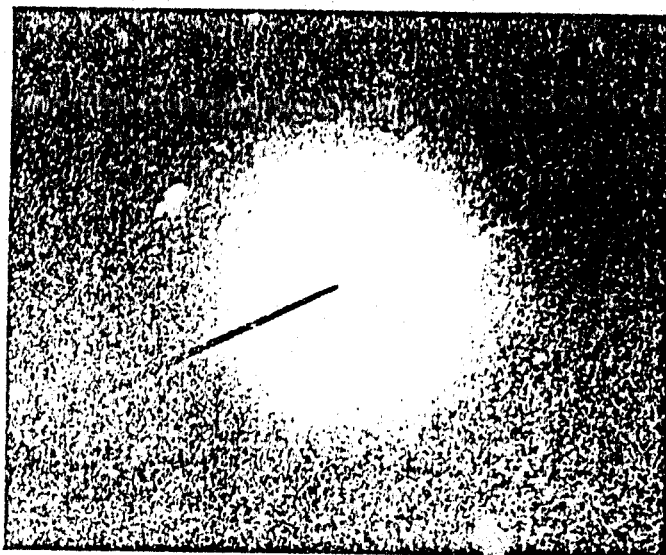
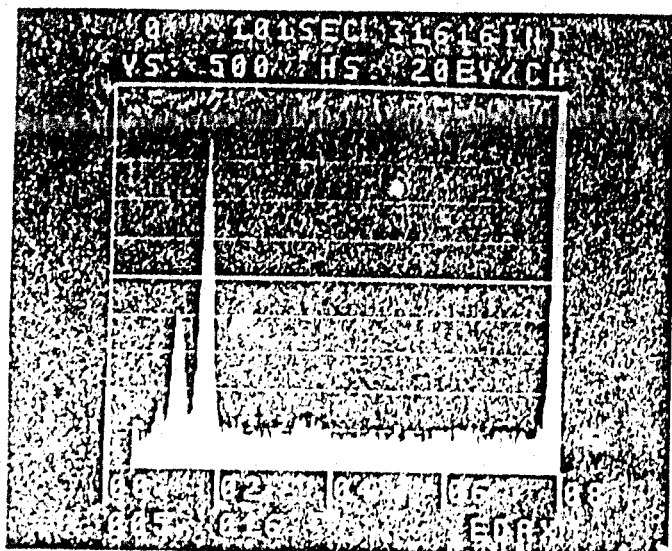
Magnification
 20,000 X

1 Micron



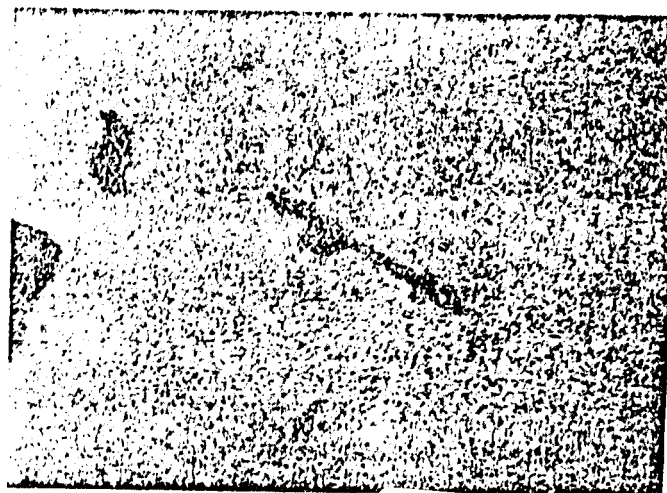
CRMC-MAD-000150

SAMPLE 005



Magnification
10,000 X

1 Micron



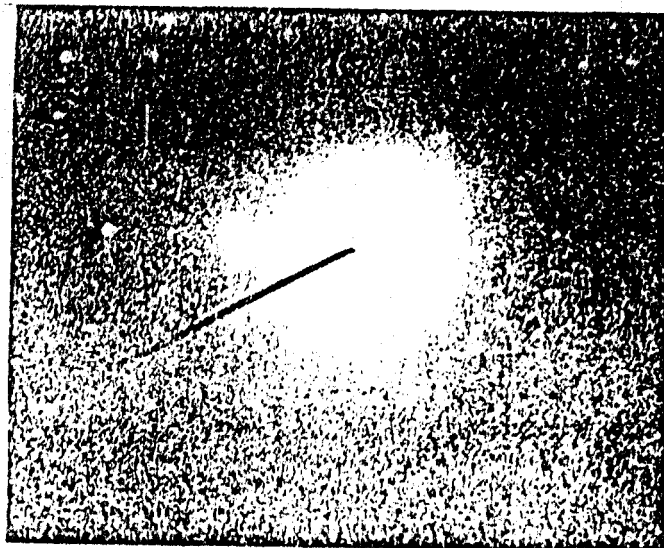
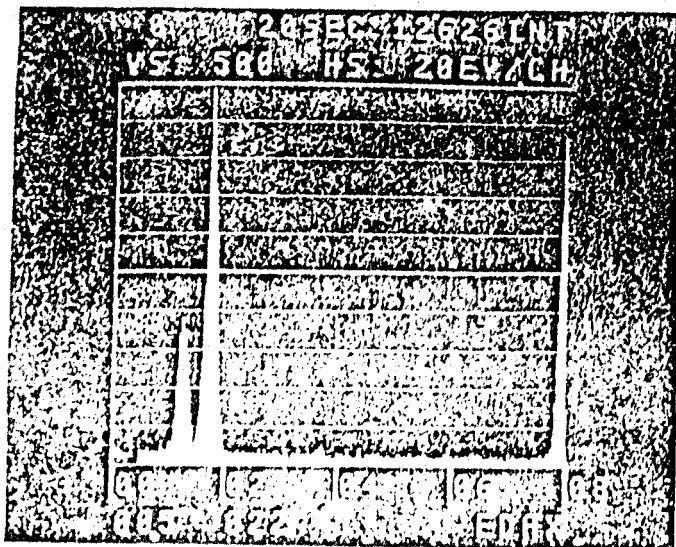
Magnification
20,000 X

1 Micron



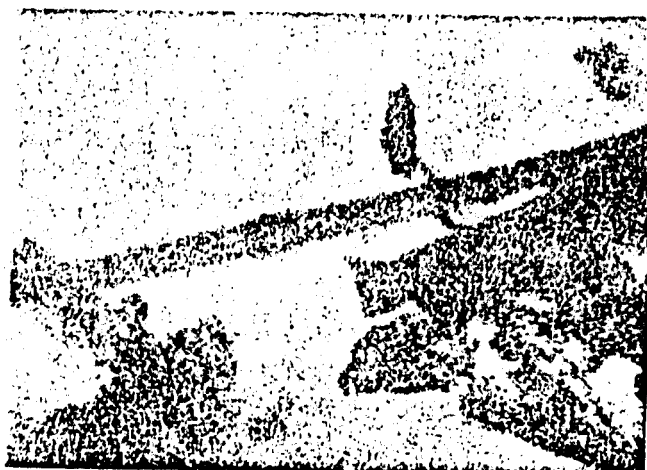
CRMC-MAD-000151

SAMPLE 7005



Magnification
10,000 X

1 Micron



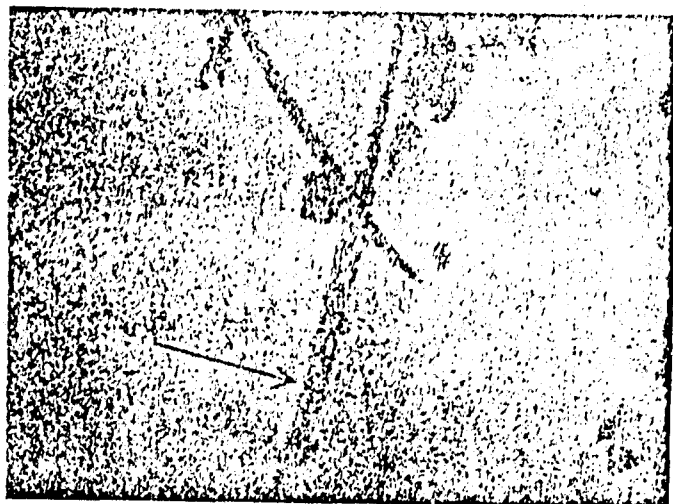
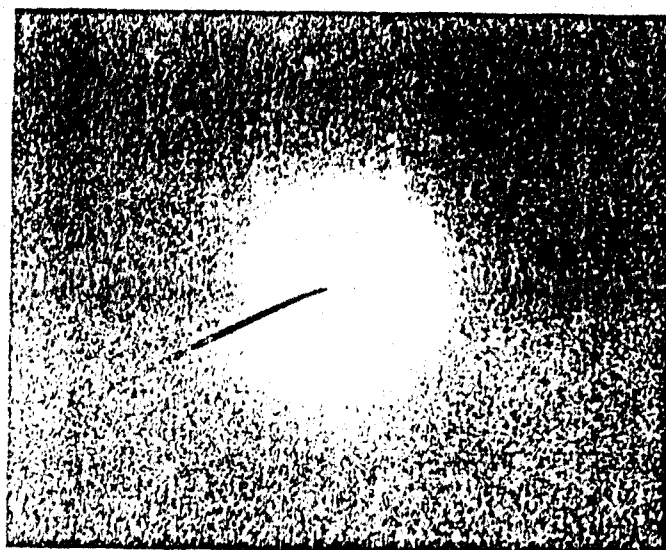
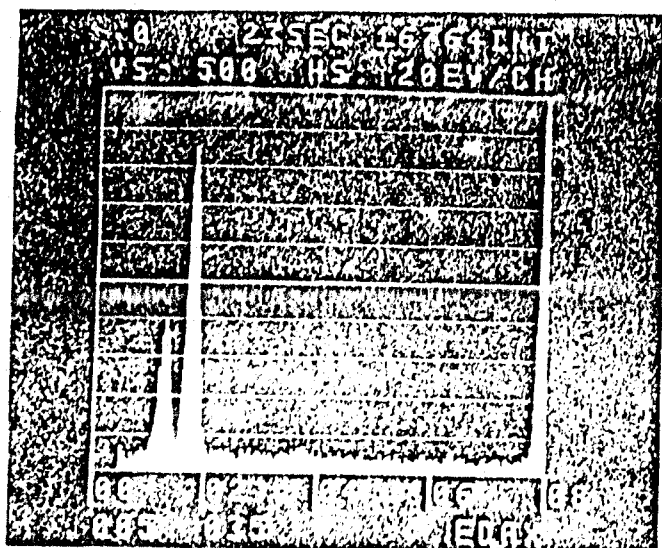
Magnification

20,000 X

1 Micron

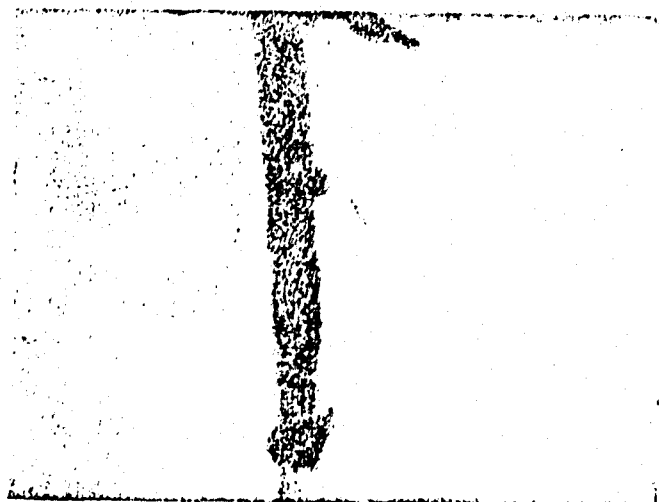
CRMC-MAD-000152

SAMPLE 005



Magnification
10,000 X

1 Micron

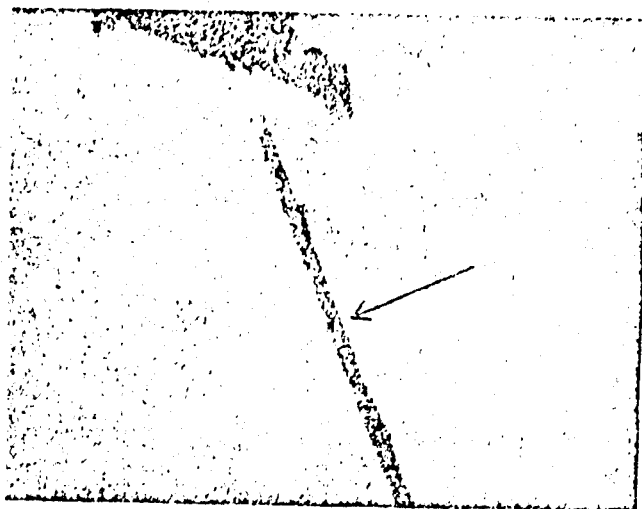
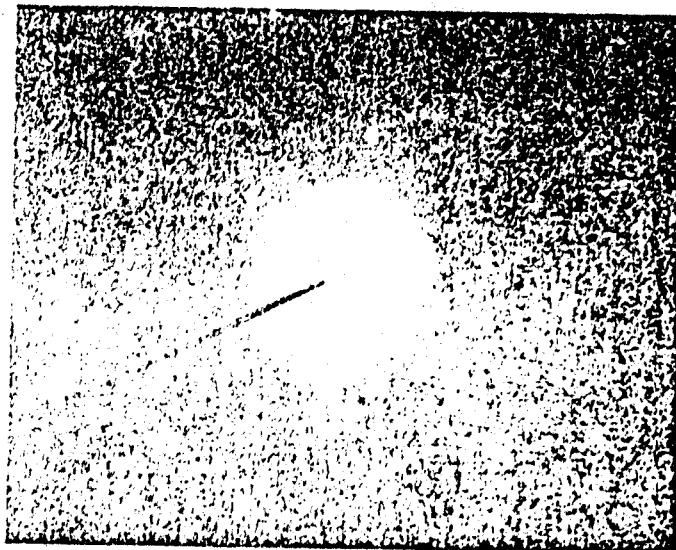
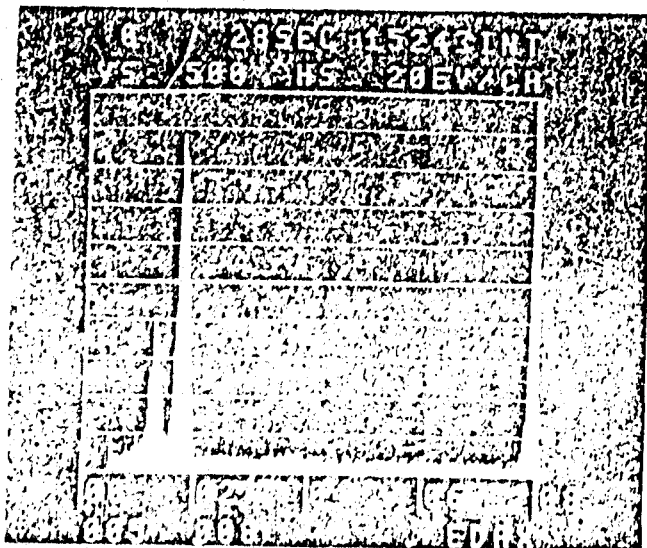


Magnification
20,000 X

1 Micron

CRMC-MAD-000153

SAMPLE 005



Magnification
10,000 X

1 Micron

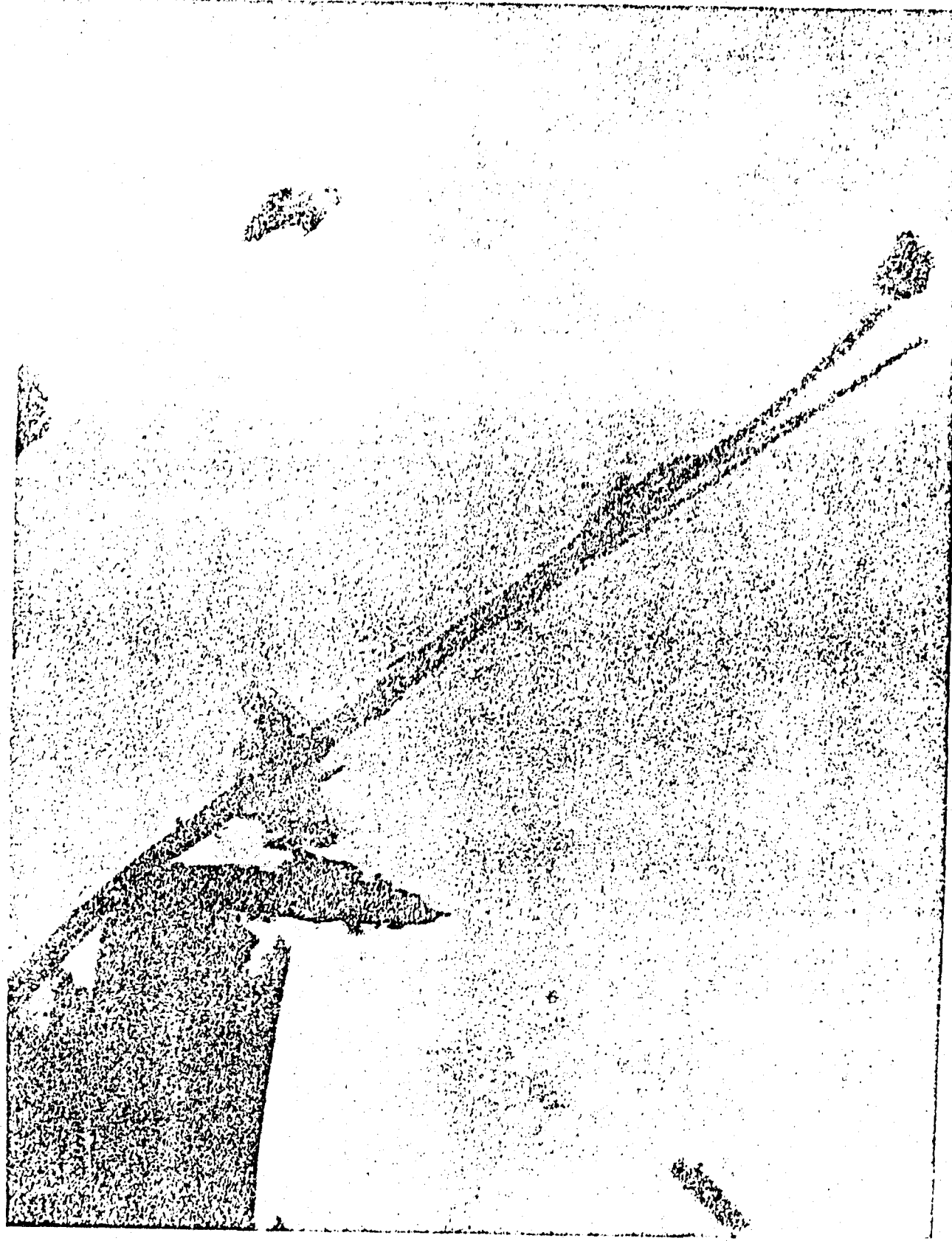


Magnification
20,000 X

1 Micron

CRMC-MAD-000154

SAMPLE 005

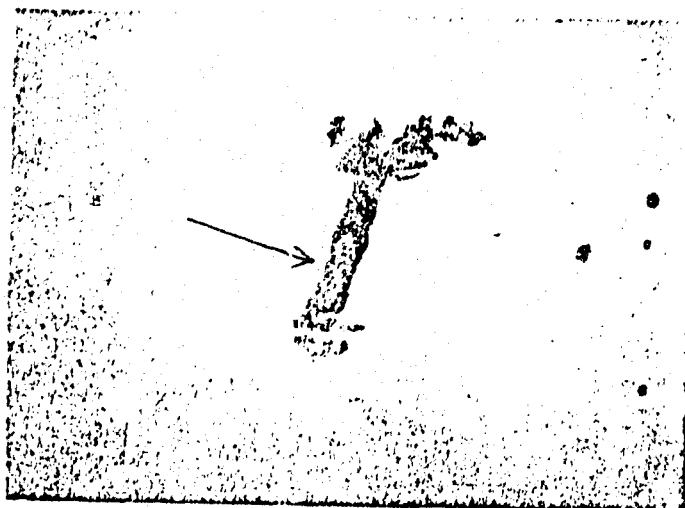
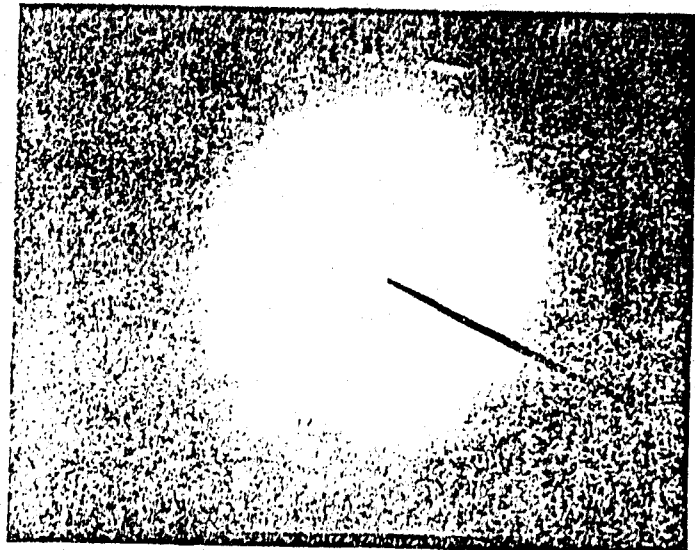
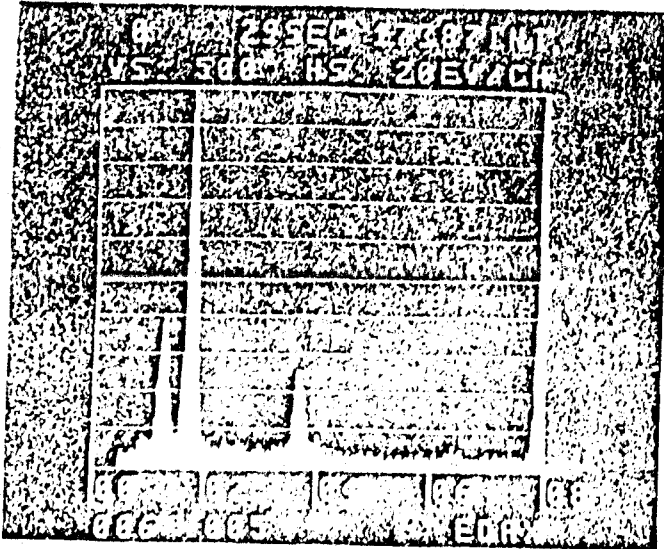


Magnification
30,000 X

1 Micron

CRMC-MAD-000156

SAMPLE 006

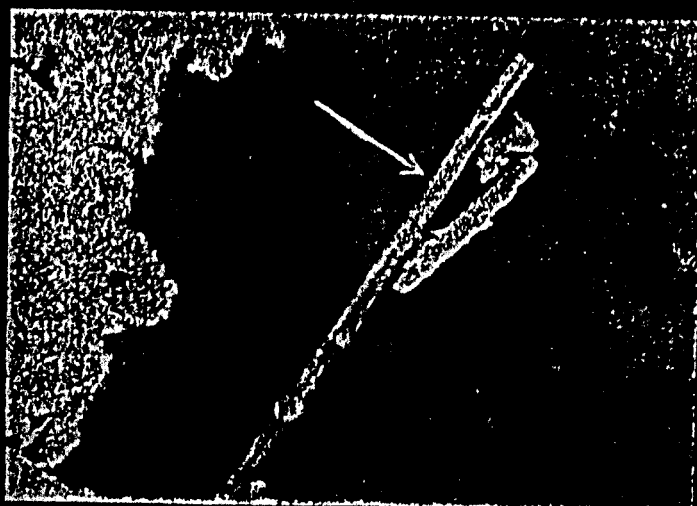
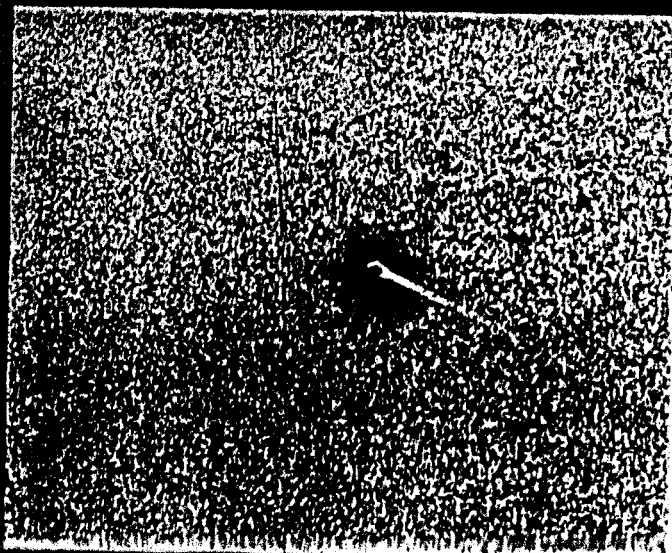
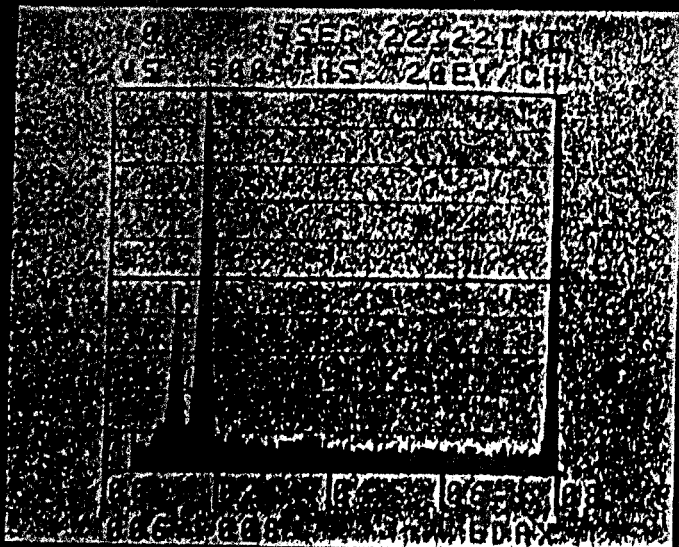


Magnification
10,000 X

1 Micron

CRMC-MAD-000157

SAMPLE 0061



Magnification
10,000 X

1 Micron

CRMC-MAD-000158

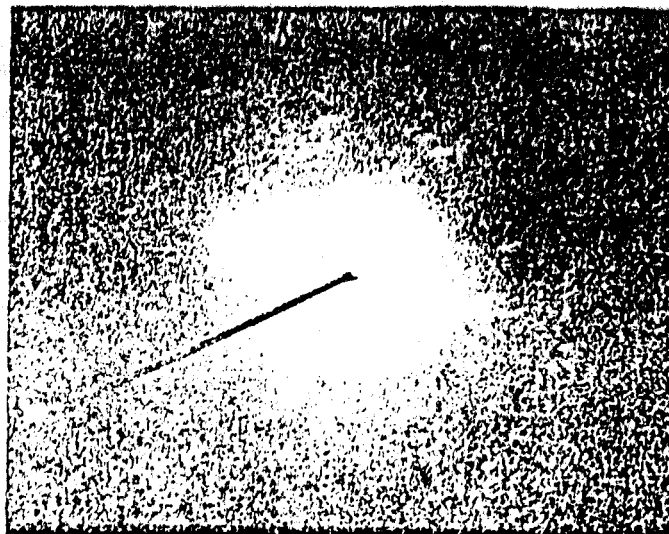
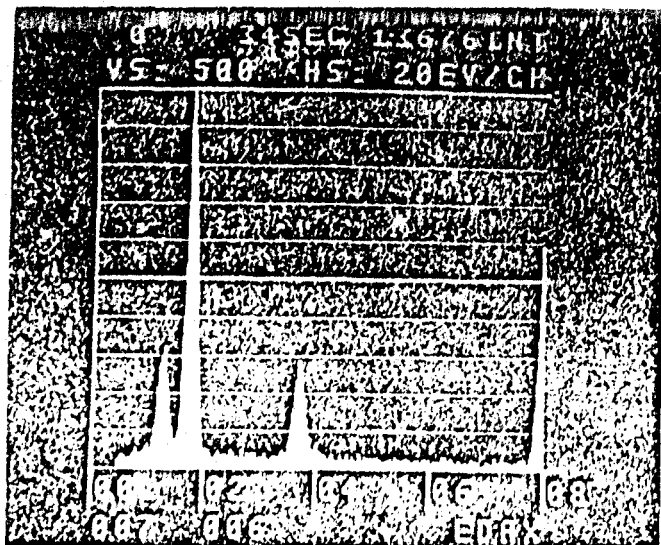
SAMPLE 6



MAGNIFICATION 3,000 X
1 MICRON —
10 MICRON —

CRMC-MAD-000159

SAMPLE 007

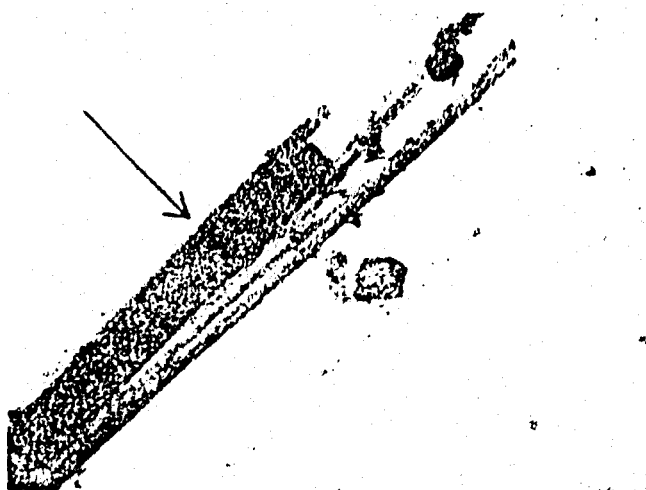
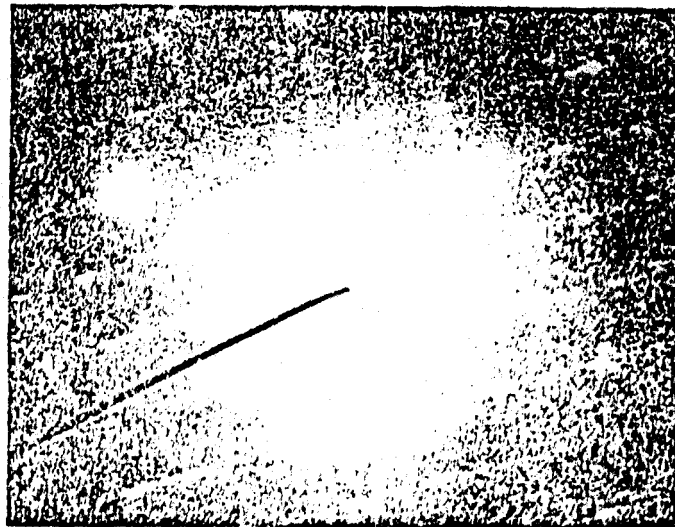
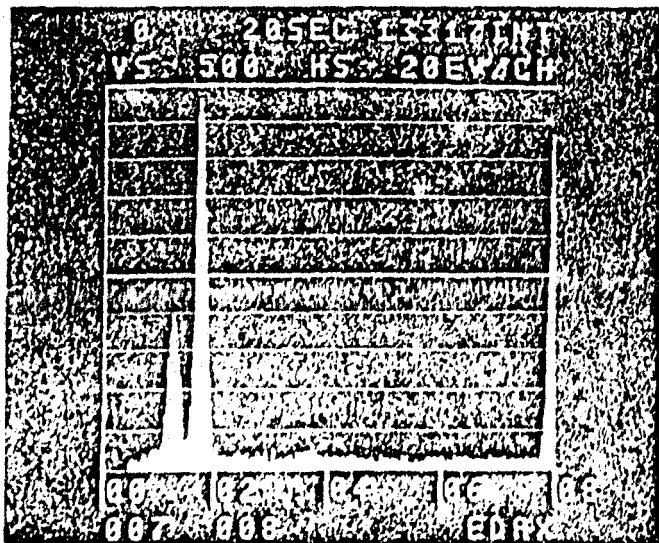


Magnification
10,000 X

1 Micron

CRMC-MAD-000160

SAMPLE 007



Magnification
10,000 X

1 Micron



Magnification
1,700 X

10 Micron

CRMC-MAD-000161

SAMPLE 007



MAGNIFICATION 3,000 X
1 MICRON —
10 MICRON —————

CRMC-MAD-000162

SAMPLE 007



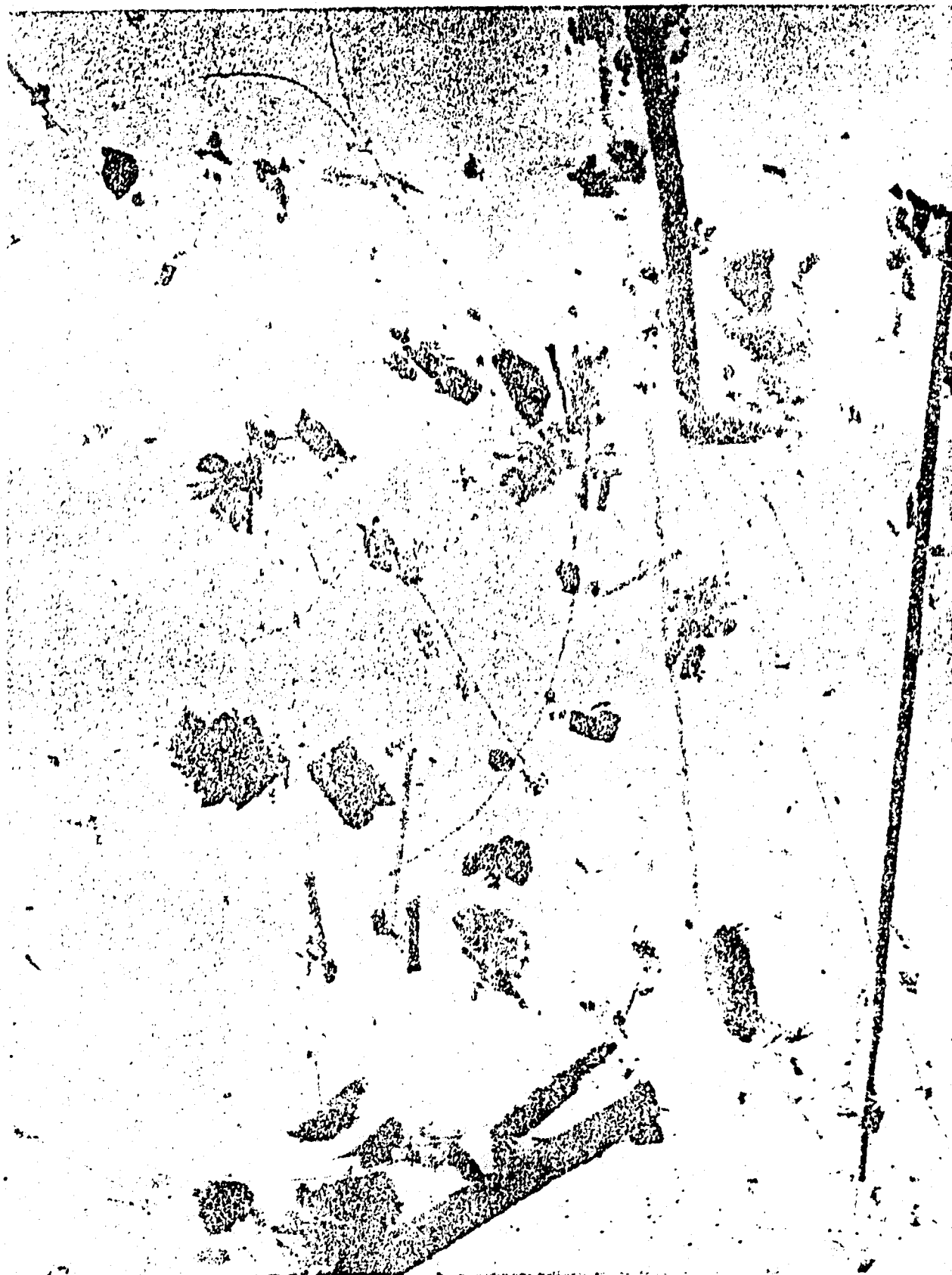
Magnification
7,000 X

1 Micron



CRMC-MAD-000163

SAMPLE 007



MAGNIFICATION 3,000 X
1 MICRON —
10 MICRON —————

CRMC-MAD-000164



MOUNT SINAI SCHOOL OF MEDICINE
of The City University of New York
FIFTH AVENUE AND 100TH STREET • NEW YORK, N.Y. 10029



Department of Community Medicine

April 29 1976

Mr. John Dement
NIOSH Room 527
Post Office Building
Fifth and Walnut Street
Cincinnati, Ohio 45202

Dear Mr. Dement:

This report covers the results of analyses of seven NYTAL samples; 400, 3X, X, FT, 300, 325 and 5X.

The seven samples were analyzed quantitatively for three varieties of asbestos minerals - chrysotile, anthophyllite and tremolite and also for quartz. Analytical techniques included polarized optical microscopy, x-ray diffraction, transmission electron microscopy and scanning electron microscopy with energy dispersive analytical systems.

Quantitative determinations by x-ray diffraction of the four minerals in question were made by comparison with dilution standards of these minerals. A uniform method of back mounting in which the sample is remounted and re-run four times at identical instrumental settings over diagnostic reflections has been shown to be reproducible and accurate. Quantitation of these minerals was also done by x-ray diffraction in the step-scan, fixed count mode.

Integrated intensities for diagnostic x-ray reflections were measured using both the back-mounting and step-scan techniques. When referred to calibration curves prepared by each technique, the NYTAL unknowns showed agreement, averaging about 10% standard error. The results are as follows:

	SERPENTINE PHASE	TREMOLITE	ANTHOPHYLLITE	QUARTZ
	%	%	%	%
NYTAL 400	14-18	24	2-3	7-10
" 3X	31-35	32	not detected	7-8
" X	26-30	50-60	not determined	9-10
" FT	26-30	17	not detected	not detected
" 300	14-18	18	4-5	9-10
" 325	19-23	24	5-7	3-4
" 5X	14-18	27	7-9	8-9

Because of the large amounts of tremolite (50-60%) present in sample X anthophyllite could not be quantitatively determined by x-ray diffraction. However, micro-

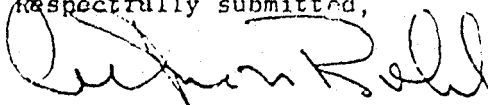
CRMC-MAD-000165

Mr. John Dement

chemical analysis of fibers on the SEM shows that anthophyllite is present. X-ray diffraction indicated the presence of serpentine phases in all samples, but the specific mineral species of this group which includes chrysotile, antigorite and lizardite, could not be positively identified although the latter most closely fitted the x-ray patterns. Examination by TEM and SEM with energy dispersive analysis system confirmed that virtually all of the serpentine phase consists of lizardite. Chrysotile was detected by electron microscopy in the samples. (See accompanying photomicrographs).

The samples were prepared for analysis by transmission electron microscopy by means of a technique which did not alter the size distribution of particles. Two squares from three EM grids were scanned at 25,000x magnification on a Hitachi HU 125 microscope. Fibrous particles were abundant in all seven samples. Morphological and crystal cleavage characteristics indicated the presence of amphiboles. This was verified by observing a typical layer-type selected area electron diffraction pattern on the fibrous particles. The layer line distance normal to the long fiber axis was consistently observed to be $5.3\text{\AA}$, which is characteristic of the c-axis repeat of amphiboles. These particles were defined as amphibole and their location on a grid facsimile recorded. The specimens were transferred to a scanning electron microscope (CMIKSCAN) equipped with an energy dispersive x-ray spectrometer. The amphibole particles were analyzed by point count and were found to fall into two general morphological-chemical types of populations which permits them to be defined as different mineral species. The long, thin fibers (aspect ratio 10/1 or more) showed Si/Mg in ratios consistent with anthophyllite composition. These fibers contained little or no iron. Short prismatic fibers with aspect ratios from about 3/1 to 5/1 contained Si/Ca/Mg proportions consistent with tremolite. No iron was found in tremolite.

Respectfully submitted,

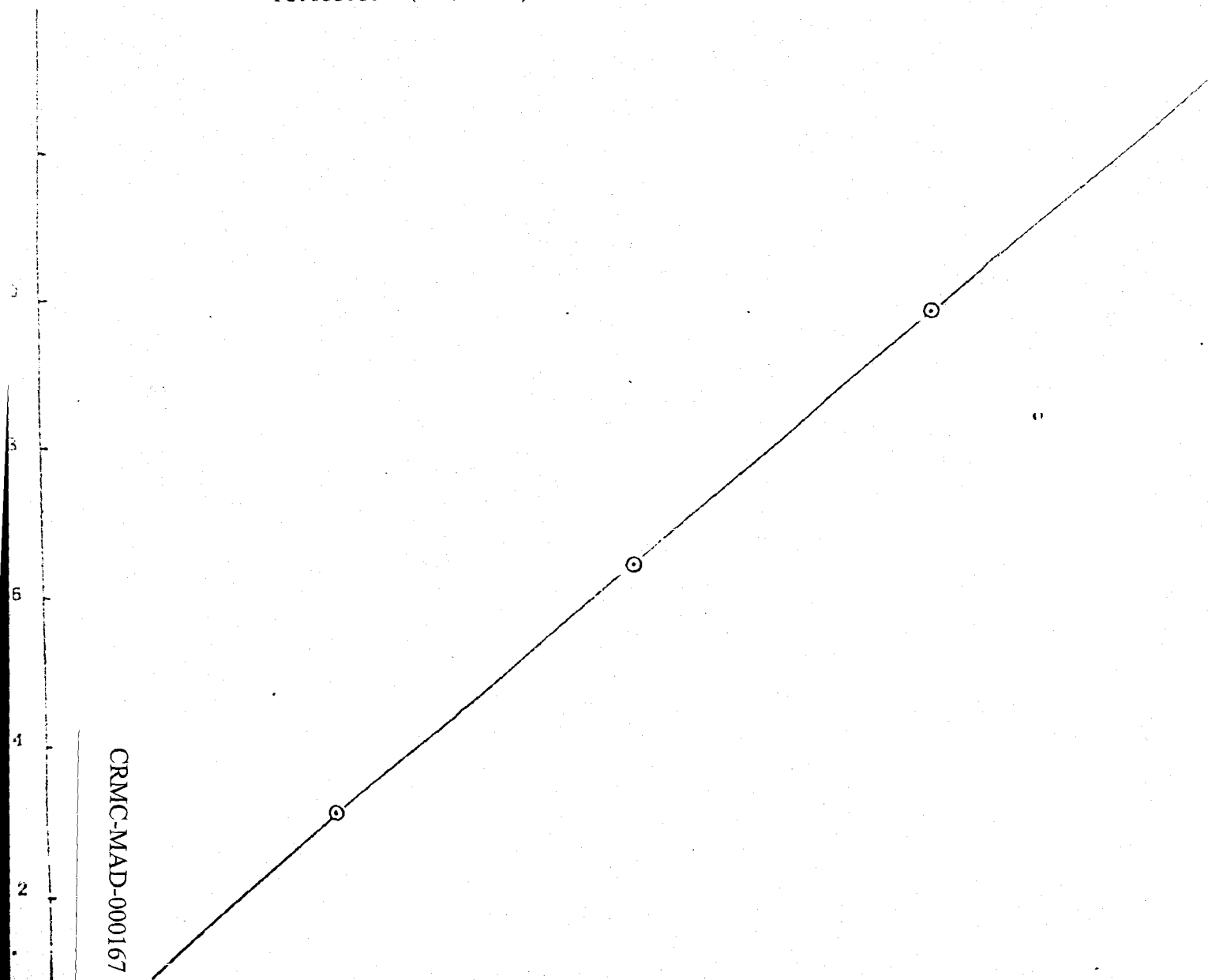


Arthur N. Rohl, Ph.D.
Environmental Sciences Laboratory

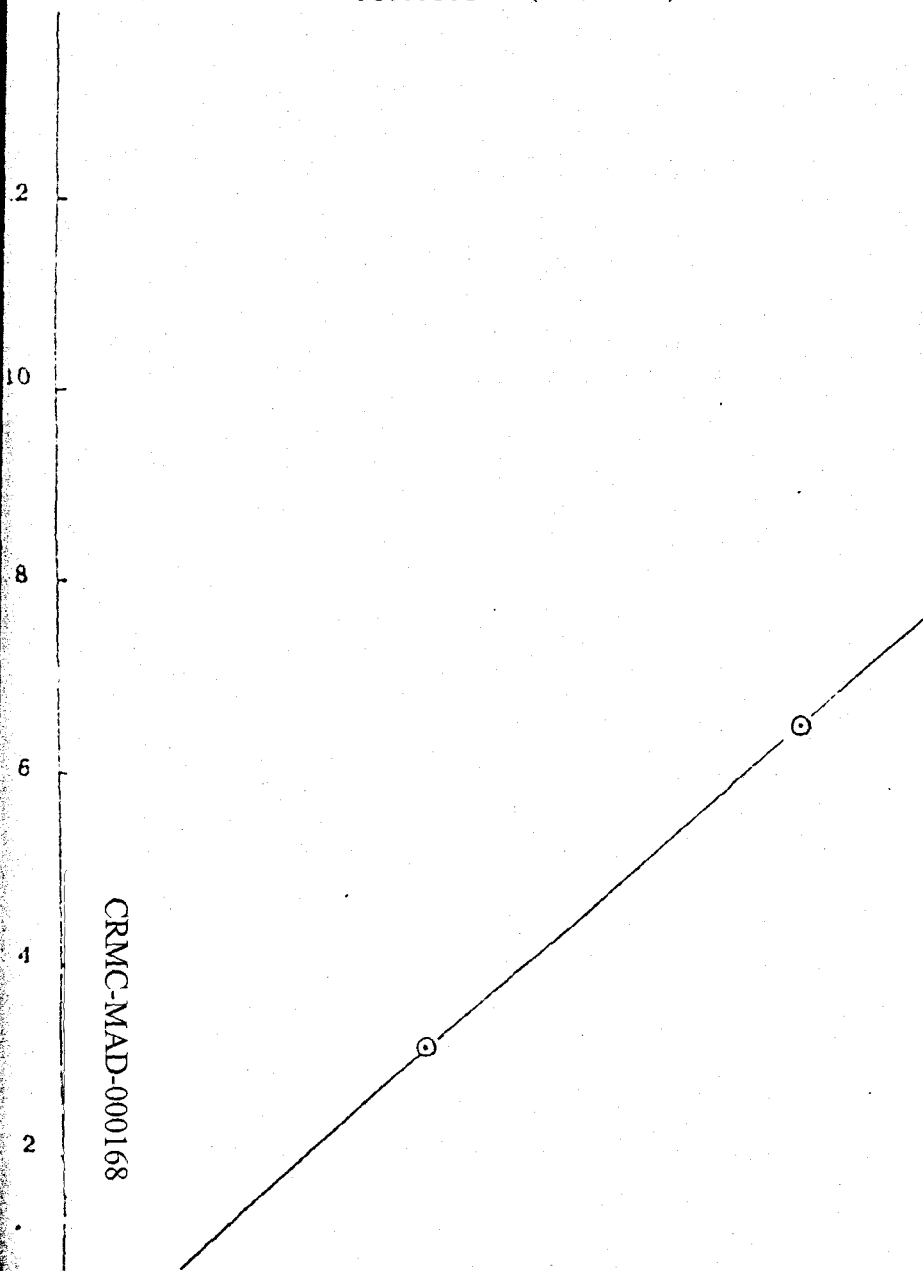
ANR:s1
Enc.

CRMC-MAD-000166

Chrysotile- talc standard dilution - step-scanned 0.02 degrees two theta over 3.66 A (004)
reflection (2×10^3)



Chrysotile- talc standard dilution -
reflection (2×10^3)



step-scanned 0.02 degrees two theta over 3.66 A (004)

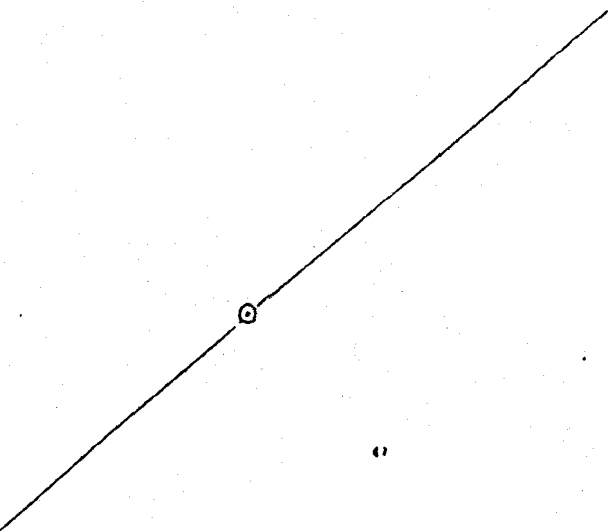
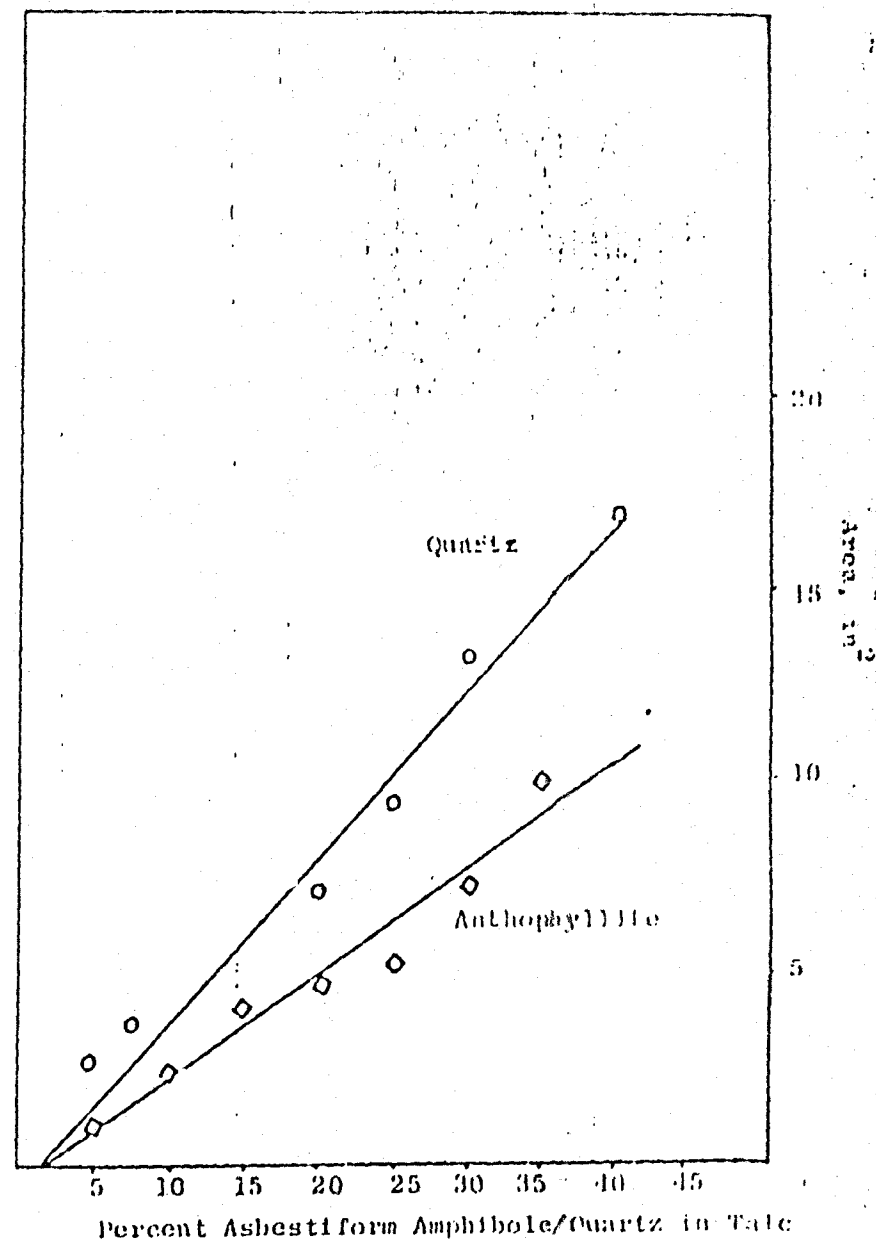
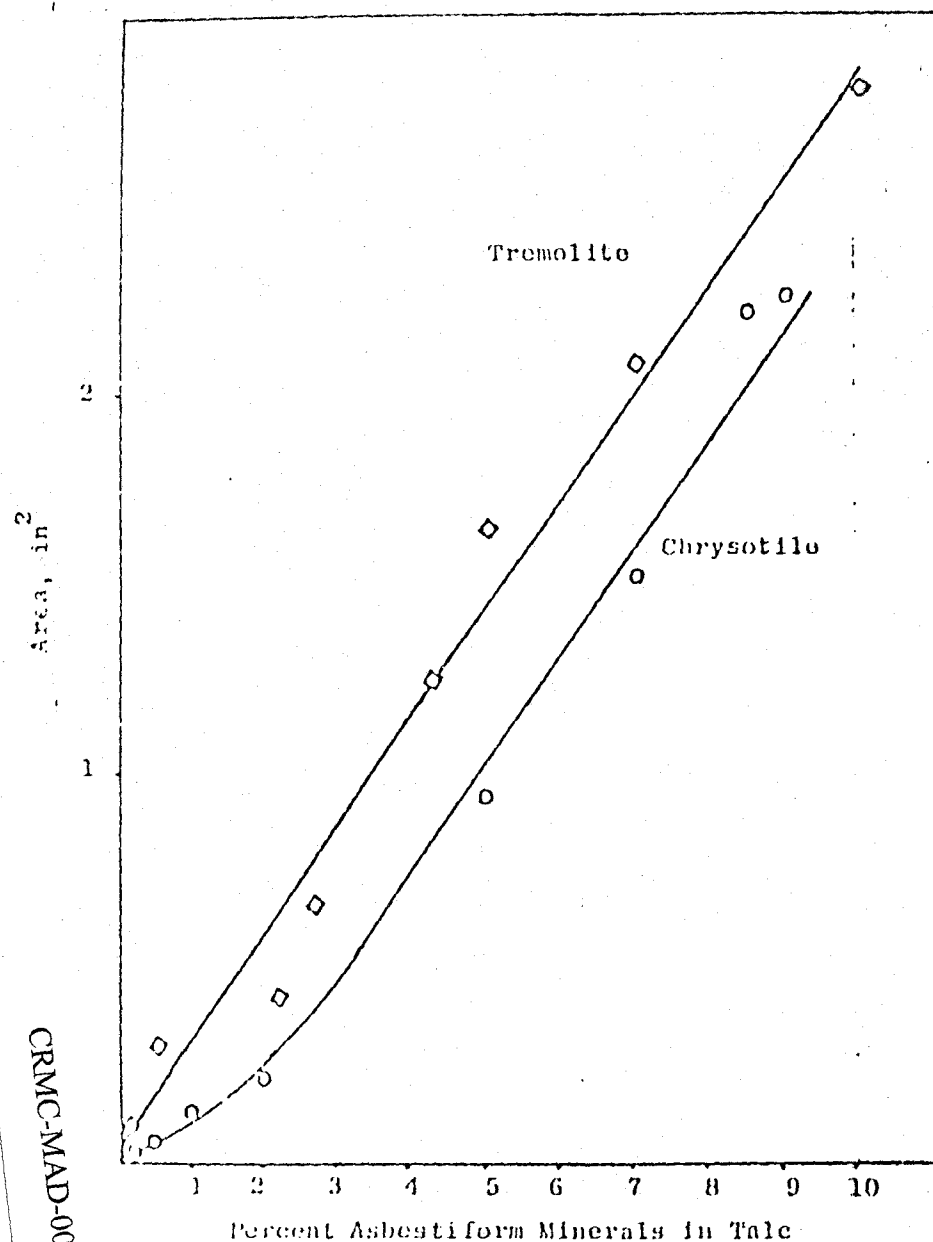


Figure 2: Calibration of Asbestiform Amphiboles and Quartz in Talc



CRM-MAD-000169

Anthracyllite Standard Dilution in Meroxide solution at 50°C

$y = mx + b$

$m = 0.27$

$R^2 = 0.98$

$b = 1.52$

8.26 mmol/L

Scan speed

2×10^3 cts

0.27

1.52

15.50

8 4

5 8.2

10 2.17

15 3.52

20 4.88

35 6.25

30 7.55

35 8.93

$r^2 = 0.95$

$x = 2y - 61$

Fluor Under Curve in inches

1

2

3

4

5

6

7

8

9

10



NYTAL 315
MAGNIFICATION 31,000 X
(X2.5)

CRMC-MAD-000171



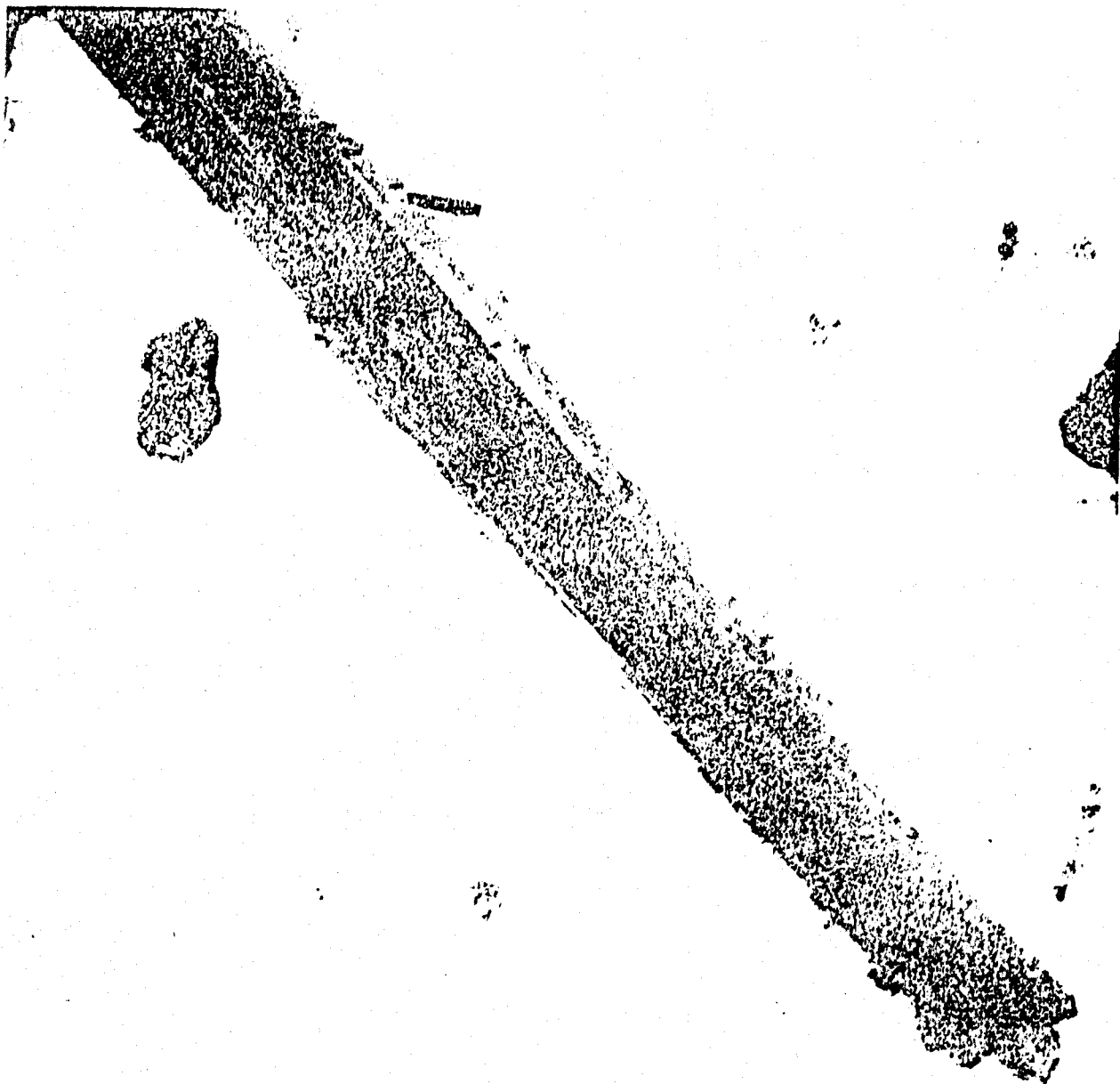
NYTAL X
MAGNIFICATION 10,000 X
(X2.5)

CRMC-MAD-000172



NYTAL X
MAGNIFICATION 3,500 X
(X2.5)

CRMC-MAD-000173



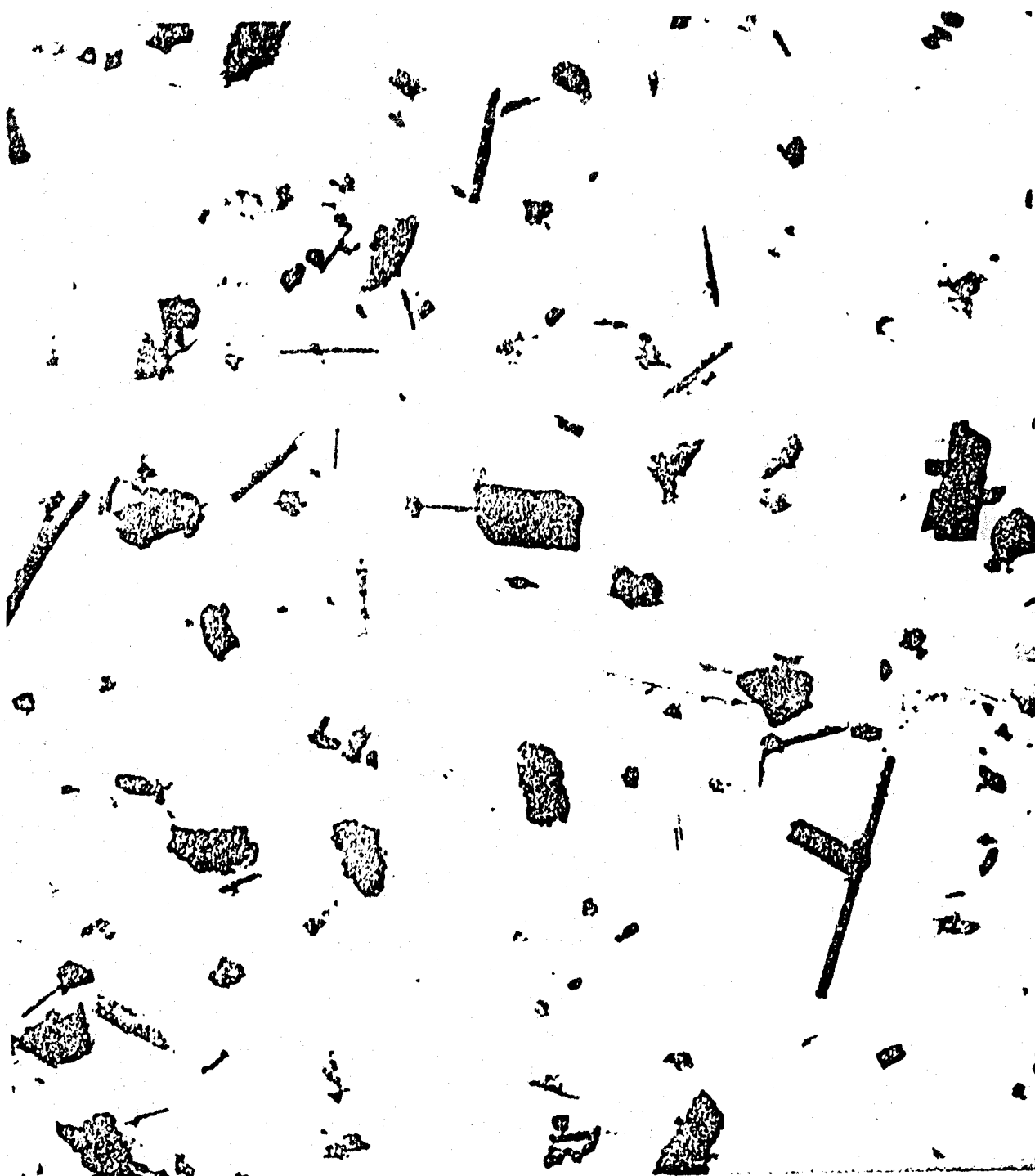
NYTAL X
MAGNIFICATION 42,000 X
(X2.5)

CRMC-MAD-000174



CHRYOTILE
NYTAL X MAGNIFICATION 7,100 X

CRMC-MAD-000175



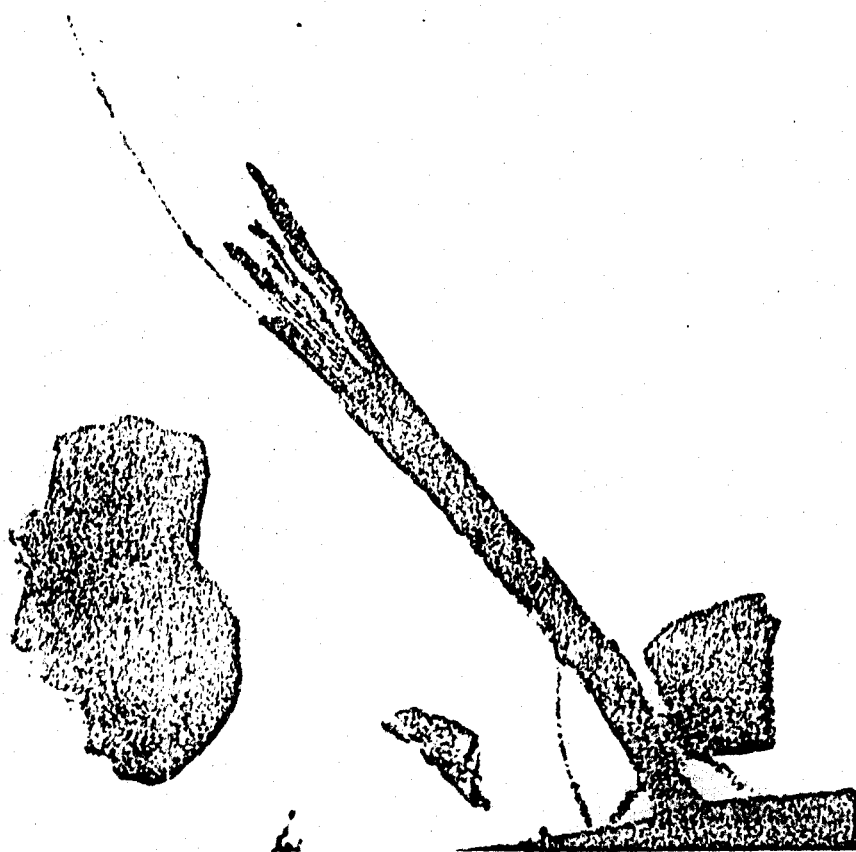
NYTAL FT
MAGNIFICATION 3,500 X
(X2.5)

CRMC-MAD-000176



CHRYSOTILE
NYTAL FT
MAGNIFICATION 7,100 X

CRMC-MAD-000177



CHRYSOTILE
NYTAL 325
MAGNIFICATION 7,100 X

CRMC-MAD-000178



NYTAL 3X
MAGNIFICATION 7,100 X
(X2.5)

CRMC-MAD-000179



NYTAL 3X
MAGNIFICATION 3,500 X
(X2.5)

CRMC-MAD-000180



NYTAL 3X
MAGNIFICATION 3,500 X
(X2.5)

CRMC-MAD-000181



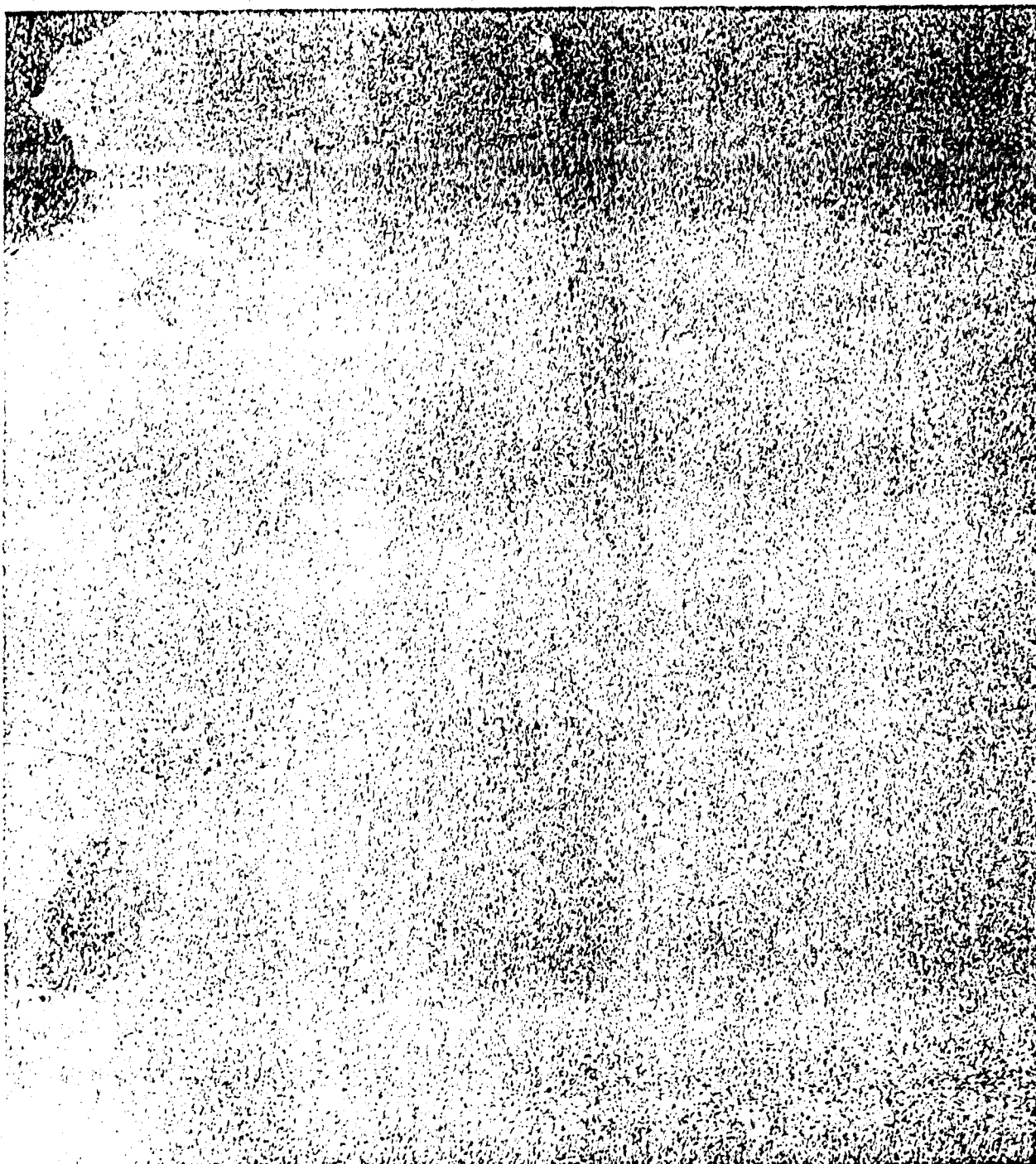
CHRYOTILE
NYTAL 5X
MAGNIFICATION 7,100 X

CRMC-MAD-000182



NYTAL 400
MAGNIFICATION 7,100 X
(X2.5)

CRMC-MAD-000183



CHRYOTILE
NYTAL 3X
MAGNIFICATION 19,000 X

CRMC-MAD-000184



NYTAL 300
MAGNIFICATION 31,000 X
(X2.5)

CRMC-MAD-000185



NYTAL-300
MAGNIFICATION 3,500 X
(X2.5)

CRMC-MAD-000186

CRM-C-MAD-000187

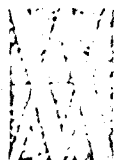


NYTAL 5K
MAGNIFICATION 19,000 X
(X2.5)

NYTAL SX
MAGNIFICATION 3,500X
(X2.5)



CRMC-MAD-000188



Report to
Dr. John Dement
NIOSH
Cincinnati, Ohio 45202

EXAMINATION OF TALCS FROM
GOUVERNEUR DISTRICT — NEW YORK

Date: 12 December 1975

MA Number: 4800

Copy 3 of 4

walter c. mccrone associates, inc.

2820 SOUTH MICHIGAN AVENUE • CHICAGO, ILLINOIS 60616

CRMC-MAD-000189

TABLE OF CONTENTS

	Page no.
Summary	1
Introduction	2
Material and Method of Conducting Tests	2
Light Microscopy	2
X-ray Diffraction	2
Electron Microscopy	3
Results	3
Light Microscopy	3
X-ray Diffraction	4
Electron Microscopical Examination	7
Conclusions	10

CRMC-MAD-000190

EXAMINATION OF SEVEN TALCS FROM THE GOUVERNEUR DISTRICT, NEW YORK

SUMMARY

An extensive examination has been carried out of seven talcs submitted by the National Institute of Occupational Safety and Health, to determine their asbestos content. These talcs all originated from the Gouverneur District of New York State and were identified by number code in the series 83775-83761.

Examination was carried out by a combination of light microscopy, using both polarized light and dispersion staining, x-ray diffraction, and electron microscopy combining electron diffraction and elemental analysis.

The results of the examination showed the presence of asbestiform amphibole in all seven samples. The amounts of the total amphibole and of the fibrous amphibole differed between the various samples. In all cases the principal asbestiform amphibole was identified as tremolite, but this was of a low calcium variety, containing approximately 2-3% calcium.

In Sample 83757, x-ray diffraction examination suggested that a small percentage of anthophyllite was also present. Examination by light microscopy, however, could not conclusively differentiate between anthophyllite and tremolite in this sample. The identification of tremolite rather than a calcium bearing anthophyllite in all samples was based on the extinction angle, observed under crossed polars, of the fibrous amphibole.

CRMC-MAD-000191

INTRODUCTION

The National Institute of Occupational Safety and Health is currently sponsoring a study of occupationally related disease in the talc industry. As part of this study, Walter C. McCrone Associates, Inc., has been contracted to study and characterize the raw talc ores. The present work is related to this major program and is concerned with a study of seven specific samples from the Gouverneur talc ore body.

Material and Method of Conducting Tests

Seven talc samples were submitted to Walter C. McCrone Associates, by John Dement of NIOSH. These samples were identified by numbers running in sequence from 83755-83761. No indication was given of the sample location within the Gouverneur talc body. The samples were examined by light microscopy, using both polarized light and dispersion staining, x-ray diffraction, and transmission electron microscopy combined with electron diffraction and elemental analysis.

Light microscopy

Permanent mounts were prepared for all seven samples, using Aroclor 5442 as a mounting medium. These preparations were examined under partially uncrossed polars to obtain a general indication of the mineral types present together with their shapes and sizes. Samples for examination by dispersion staining were prepared using Cargille high dispersion refractive index liquids with n values of 1.550 and 1.605. The lower refractive index was used to examine the serpentine content of the tales; the higher value was chosen to enable identification of the amphibole present. Examination by dispersion staining was at a magnification of approximately 200X in plane polarized light.

X-ray diffraction

For x-ray diffraction examination, samples of the powders were packed into aluminum cup holders and placed in the Norelco diffractometer. The samples were rotated around an axis perpendicular to the axis of the diffractometer which was scanned through a 2θ range from approximately 6° to approximately

60° with a scanning speed of 1° per minute and a chart speed of 1/2 inch per minute. Cu radiation, nickel filtered, was used at an accelerating voltage of 42 kV, and a current of 25 milliamps. The quartz content of the samples was determined by step scanning through the 3.35 Å line for quartz and comparing the resulting data with that for "spiked" standards of quartz in talc. The step increment was 0.01°, 2θ with a counting time per step of 50 secs., an 8 sec. time constant and a chart speed of 1/8 inch per minute.

Electron microscopy

For electron microscopic examination samples of the powder were suspended in isopropanol and lightly ultrasonerated. A drop of this suspension was placed on carbon coated Nylon grids. Examination of the samples was carried out in a combined electron-microscope-microprobe-analyzer, EMMA-IV. The samples were examined and photographed at several different magnifications, electron diffraction patterns were obtained from typical fibers present and energy dispersive x-ray analysis was performed on these fibers.

RESULTS

1) Light microscopy

The following general statements can be made:

All the samples contained a serpentine which, on the basis of dispersion staining and morphology, has been identified as lizardite. Chrysotile (the asbestiform variety of serpentine) and antigorite were not detected.

All the samples contain tremolite identified by dispersion staining and polarized light microscopy and, although it would be possible to miss a small percentage of anthophyllite particles, since most anthophyllites give nearly the same dispersion staining colors as tremolite, appreciable amounts of anthophyllite would not be missed because a significant number of particles would lie in the proper orientation for positive identification. With the exception of an occasional particle in Sample 83757, all the particles which showed the tremolite/anthophyllite dispersion colors showed oblique extinction under crossed polars ($\gamma^c = 17-18^\circ$), thus identifying them as tremolite.

All samples contain talc in a form which looks like fibers. These give typical talc colors by dispersion staining. The majority of these talc fibers are apparently long talc rods. These talc fibers are especially long in Sample S3759.

Most samples are believed to contain a little quartz on the basis of the light microscopical examination. It is difficult to put an accurate value to the amount of quartz present, since it is extremely difficult to distinguish between quartz and lizardite under dispersion staining conditions.

A calculation of the percentage of amphibole present and of the portion of this amphibole which was fibrous was made as follows. First the portion by volume of the total tremolite present as fibers was estimated taking cognizance of both particle size and numbers present. Subsequently, 30 fields in each sample were examined in detail and the percentage by area of the total particle area occupied by amphibole particles was estimated.

Table 1 summarizes the observations made by light microscopy.

X-ray diffraction

All samples showed the presence of talc, an amphibole and a serpentine. Inconclusive evidence of quartz was detected by x-ray diffraction on the normal scan. By step scanning, however, low levels of quartz were found. The quartz data are presented in Table 2 and Figure 1.

The serpentine minerals are difficult to distinguish from each other by x-ray diffraction. A paper by Mumpton¹ indicates certain lines which may be used to distinguish the three serpentine polymorphs provided that the samples are relatively monominerallic. Specifically, Mumpton mentions that lizardite is characterized by a strong doublet at $1.531 \text{ \AA}$. This doublet has indeed been observed on our x-ray diffraction trace, thereby confirming the light microscopic identification of lizardite by dispersion staining.

¹ Characterization of chrysotile asbestos and other members of the serpentine group of minerals, Siemens review XLI (1974) 7th special issue, X-ray and Electron Microscopy News.

Table I
Summary of Light Microscopical Data

	Nytral 300	Nytral 400	3X	225	X	FH	3X
Sample	83755	83756	83757	83758	83759	83760	83761
Total tremolite (% of sample by area)	25-30	15-20	20-25	25-30	25-30	15-20	25-30
Fibrous tremolite (estimated % by vol. of total tremolite)	5	25	8-10	5	1	25	10
Quartz	+	possible	+	+	-?	+	+
Serpentine	+	?	-	+	+	probable	probable
Talc "fibers" (rolls, shards etc.)	+	+	+	+	+(long)	+	+
Comments				large tremolite plates	large particle size	small particle size	

Table II
Tremolite and Quantity Content of Talc Samples

Sample	83755	83756	83757	83758	83759	83760	83761
Quartz Content**	2%	1/2-1%	~ 1 1/2%	~ 1 1/2%	<1/2%	below detection limit	1/2-1%
Content tremolite	40-50%	50-60%*?	40-50%*	~60%	>50-60%*	50-60%	40-50%

** Step scanning data.

* Indicates possible anthophyllite present in addition to tremolite.

This leaves only the amphibole to be characterized in all seven samples. The primary amphibole observed is tremolite. The diffraction lines observed are consistent with ASTM Card 13-137 for tremolite and with published data for tremolites from the Gouverneur district. In one sample, however, Sample 83757, a distinct side peak on the tremolite 8.410 line is observed and it is believed that this side peak is due to the presence of some anthophyllite. Less distinct evidence of this side peak is also present on Sample 83756 and possibly also 83759 (see Figures 2-8 for a comparison of the 6°-12°, 2θ range on these samples). As is clear from these figures, in addition to the side peak attributed to anthophyllite there is considerable variation in the ratio of talc to amphibole in these samples. An attempt to quantitate this relationship in terms of percentage of amphibole present is also given in Table 2.

Electron microscopical examination

Electron microscopical examination showed that all seven samples contain substantial amounts of fibrous material. This was highest in Sample 83757 and lowest for Samples 83756 and 83761. Several typical electron micrographs showing general areas of the samples are appended to this report (Figures 9-17). The electron microscopical examination concentrated on the fibrous material and an attempt was made to estimate how much of this material was in fact asbestiform, that is, a fibrous amphibole as distinct from the fiber forms of talc consisting of ribbons, shards, rolls, etc. This examination was conducted both by electron diffraction and by elemental analysis using energy dispersive x-ray. The results of these examinations are summarized in Table 3, the estimated percentages being based on occluded area. Some typical electron micrographs, diffraction patterns and energy dispersive x-ray spectra are appended. In none of these fibers examined was there a particularly high percentage of calcium noted; however, calcium was observed at the level of the order of 1-3% in all the amphibole fibers examined. The only conclusion which

CRMC-MAD-000197

Table III
Electron Microscopical Estimates of Fiber Content

Sample	83755	83756	83757	83758	83759	83760	83761
Total fibers	~10%	~10%	~40%	~30%	~5-10%	~20%	~10%
Fibrous amphi- bole (as % of total sample)	<5%	<5%	15-20%	10-15%	<5%	~5%	<5%

Table IV
Overall Data Summary

Sample	83755	83756	83757	83758	83759	83760	83761
Total fibers(TEM)	10%	10%	40%	30%	5-10%	20%	10%
Amphibole fibers ¹ (TEM)	<5%	<5%	15-20%	10-15%	<5%	5%	<5%
Total amphi- bole ² (XRD)	40-50%	50-60%	40-50%	~60%	>50%	50-60%	40-50%
Total amphi- bole ³ (LM)	25-30%	15-20%	20-25%	25-30%	25-30%	15-20%	25-30%
Fibrous am- phibole ⁴ (LM)	1-2%	3-5%	1-3%	1-2%	<1/2%	3-5%	2-3%
Serpentine ^{2, 5} (XRD)	10-15%	10-15%	10-12%	10-12%	~15%	~20%	~30%
Quartz ^{2, 6} (S.S. X-RD)	2%	1/2-1%	~1 1/2%	~1 1/2%	<1/2%	B.D.L.	1/2-1%

NOTES:

1. Based on occluded area
2. Estimated weight percentage
3. Based on occluded area
4. Derived from estimated % of total ampaibole which was fibrous. See also Table I.
5. Identified as lizardite by light microscopy
6. S.S. XRD = Step scanning x-ray diffraction

can be drawn from the electron diffraction and energy dispersive x-ray analysis is that one has a fibrous amphibole of the tremolite or anthophyllite type. It is generally not possible to distinguish between tremolite and anthophyllite by electron diffraction and one would therefore be tempted to suggest that the fibers were anthophyllite with a trace amount of calcium. Taken in conjunction with the light microscopical examination, however, during which a diligent search was made, particularly on Sample 83757, for fibers which might be anthophyllite rather than tremolite, one is forced to the conclusion that, rather than being a calcium bearing anthophyllite, the fibers are in fact a low calcium tremolite. The aspect ratios of many of the fibers observed are quite high and numerous fibers, such as those shown in Figures 20, 22, 24 and 30 showed the classic fibrous structure of the asbestos minerals. There is no doubt in our minds that these are indeed asbestos fibers rather than cleavage fragments of a more massive amphibole. Massive forms of the amphibole are, however, present and the fibrous amphibole content represents only a fraction of the total amphibole content of the samples.

CONCLUSIONS

Table 4 summarizes the results of all the investigations which we have carried out. In answer to the specific question, "Do these particular talc samples contain any asbestos minerals?", the answer must be an unequivocal yes. The asbestos mineral present appears to be a low calcium tremolite and is definitely asbestiform by any definition of the word. The asbestos content in the samples varies from less than 5% to approximately 20%, based on occluded areas observed in the transmission electron microscope.

Ralph J. Hinch, Jr.

Ralph J. Hinch, Jr.
Research Chemist

Richard J. Shimps

Richard J. Shimps
Research Chemist

Respectfully submitted,

Lucy B. McCrone

Lucy B. McCrone
Senior Research Scientist

Ian M. Stewart

Ian M. Stewart
Manager, Electron Optics Group

CRMC-MAD-000200

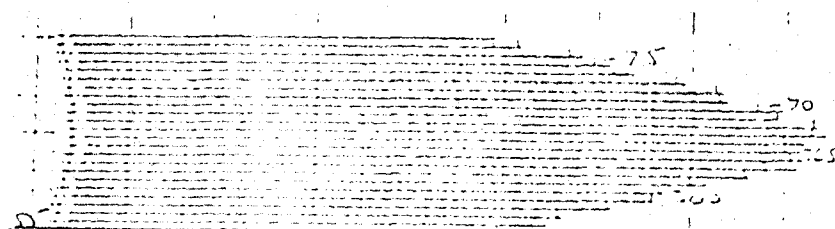
FIGURES 1 THROUGH 40

EXAMINATION OF TALCS FROM

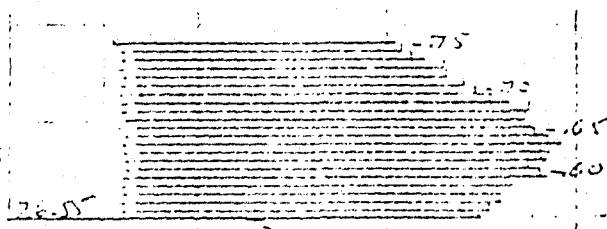
GOUVERNEUR DISTRICT — NEW YORK

CRMC-MAD-000201

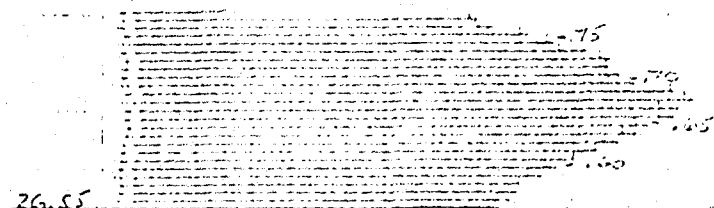
Figure 1 Step scanning data for quartz



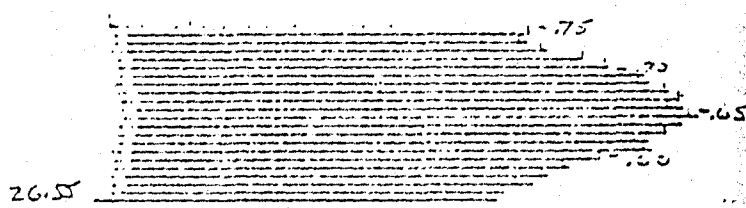
Sample 83755 (001) Talc (α -SiO₂+) 26.55



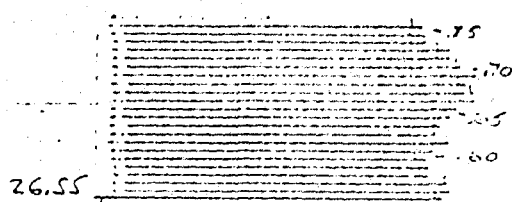
Sample 83756 (002) Talc (α -SiO₂+) 26.55



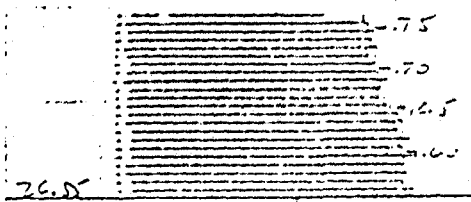
Sample 83757 (003) Talc (α -SiO₂+) 26.55



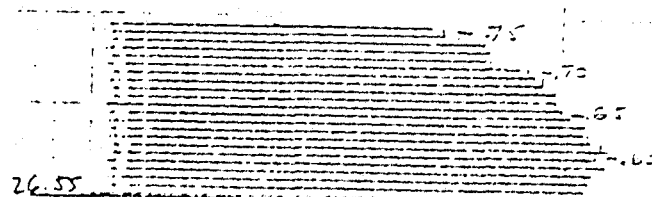
Sample 83758 (004) Talc (α -SiO₂+) 26.55



Sample 83759 (005) Talc (α -SiO₂+) 26.55



Sample 83760 (006) Talc (α -SiO₂+) 26.55



Sample 83761 (007) Talc (α -SiO₂+) 26.55

12

11

10

9

8

7

6

10

20

30

40

50

60

70

80

90

X-RAY DIFFRACTION DATA

Sample No. 001 Project No. 4800

Material

Al₂O₃ 83755 Talc

Radiation Cu Power 42-25

Filter Ni Scale Factor 1.000

Multiplier 2 Time Constant 2

Scan Speed 1/2°/min Chart Speed 1/2" / min

Slit 1° - 0.025" - 1°

Remarks Rotating sample

Date 11-13-75 Operator RJ Hinch

Figures 2-8 6"-12" range of 2θ for Samples 83755-83761

Figure 2

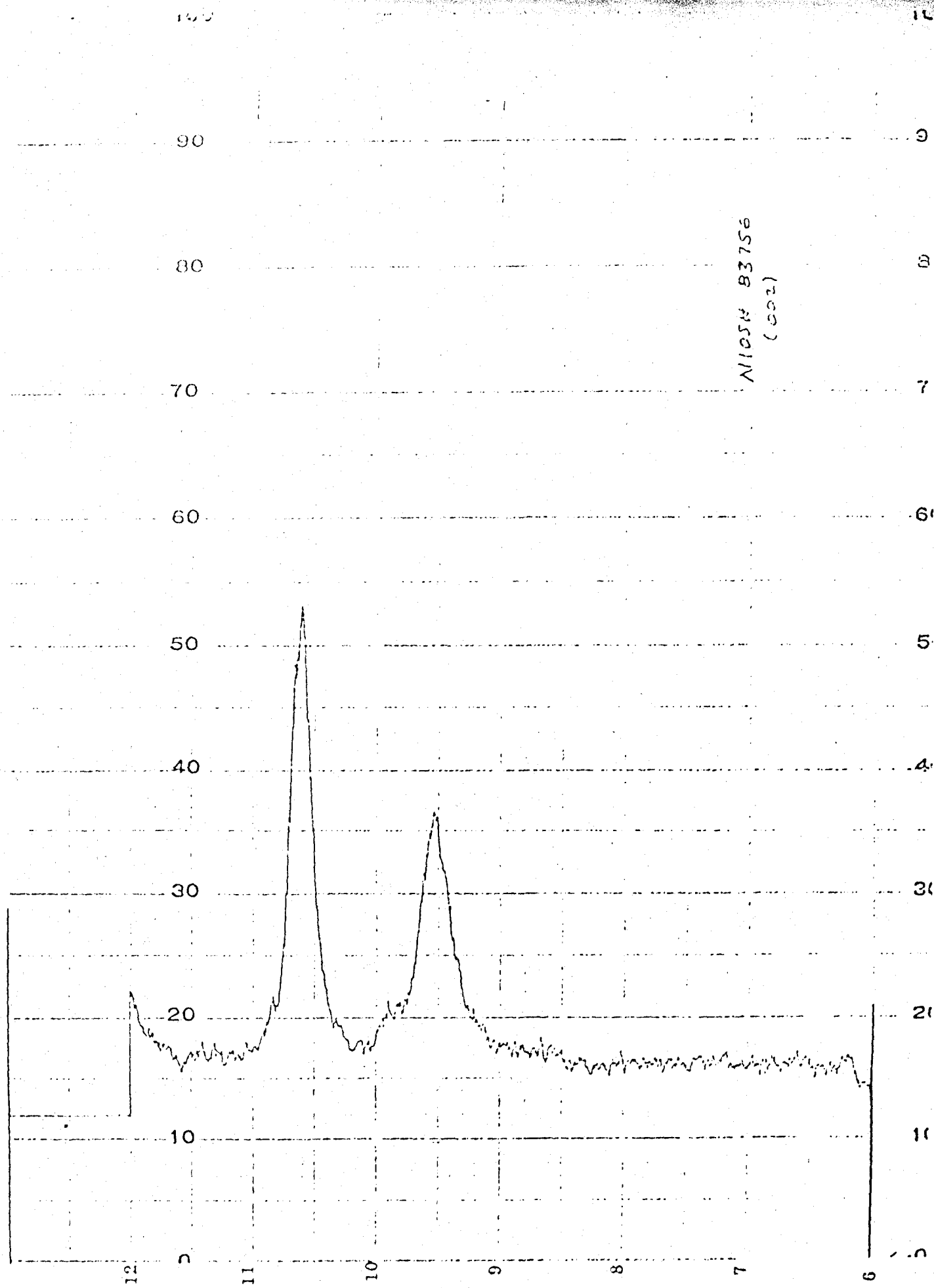


Figure 2

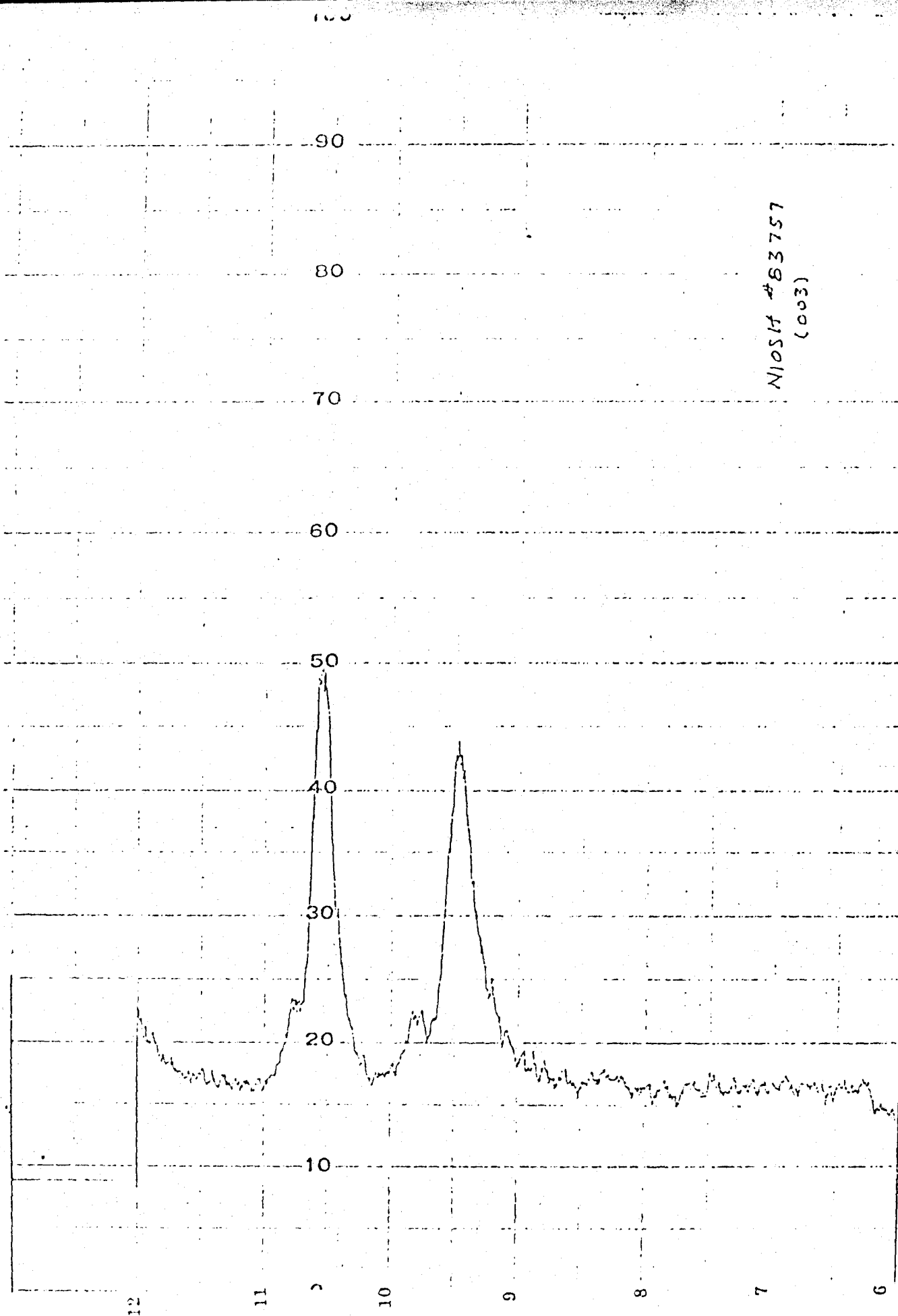


Figure 4

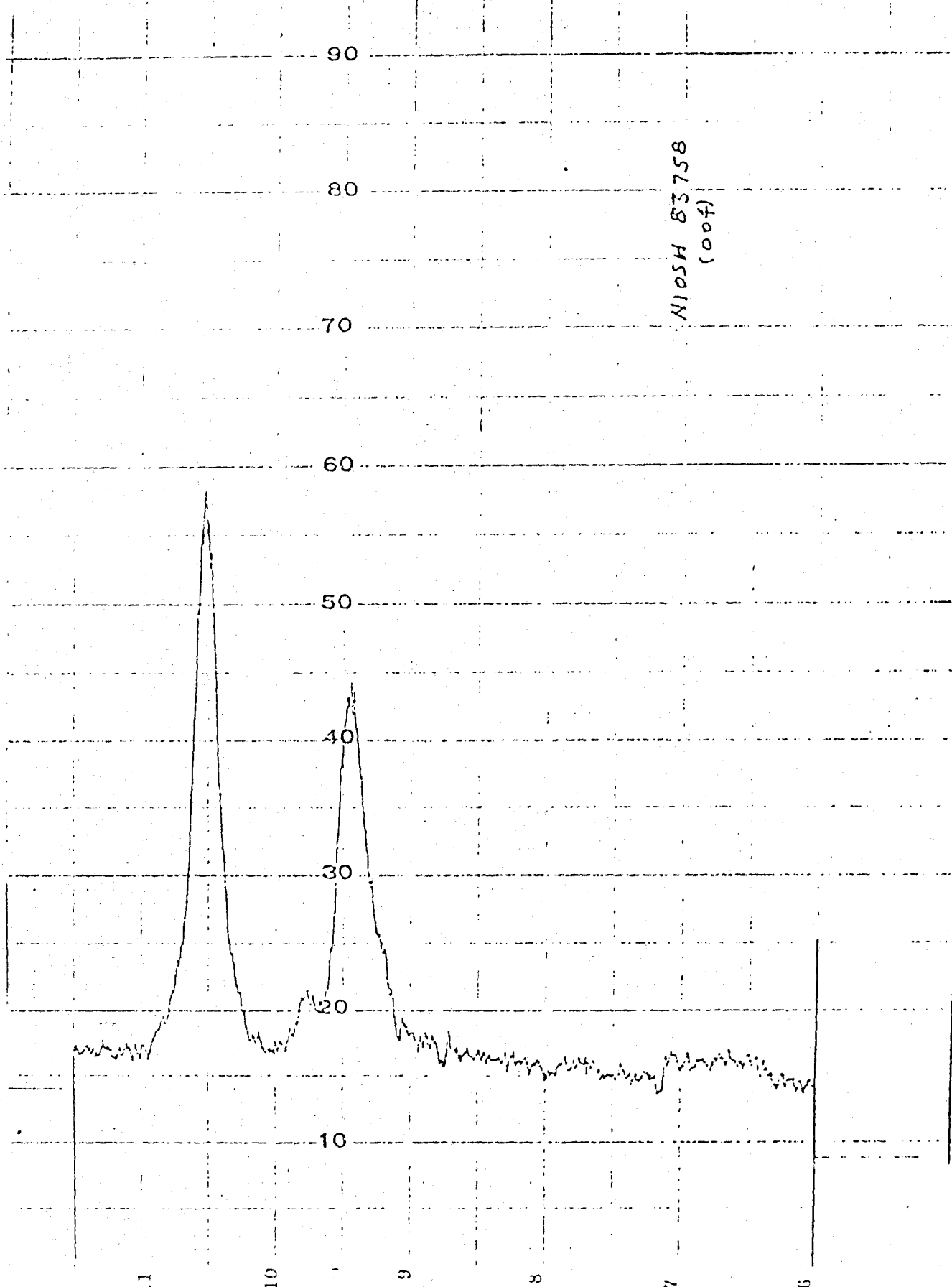


Figure 5

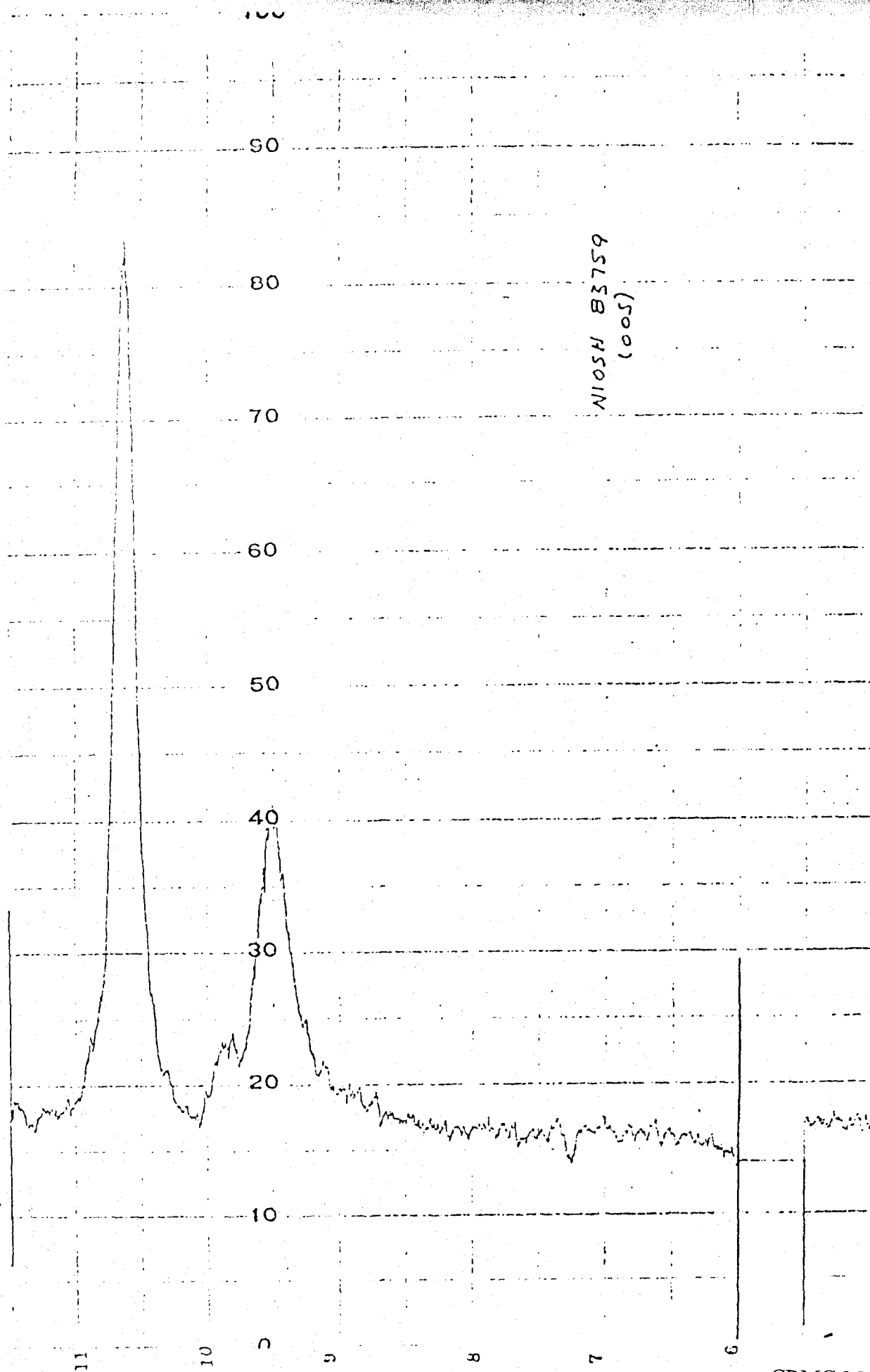
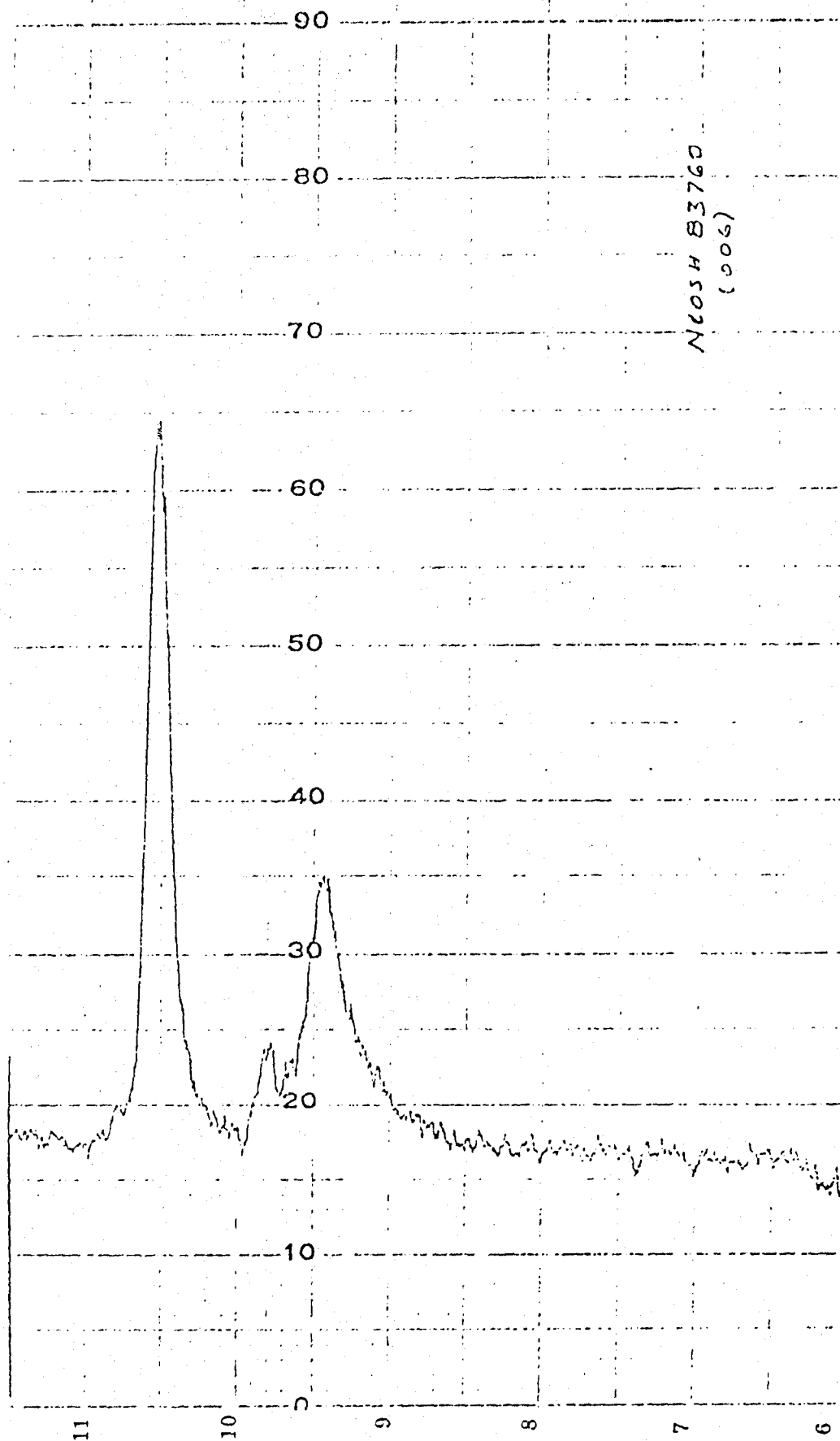


Figure 6



walter c. macrone associates, inc.

Figure 7

CRMC-MAD-000208

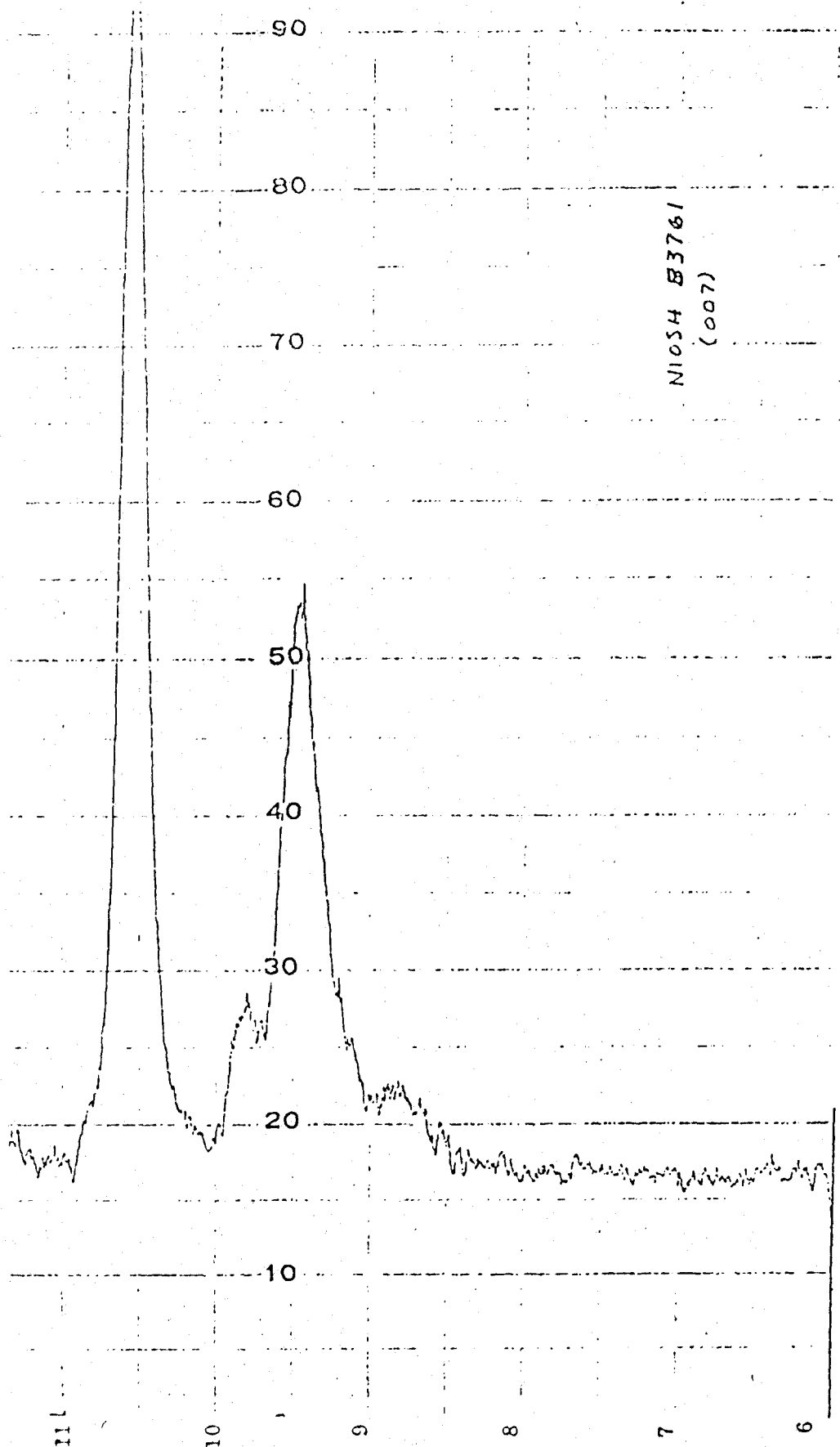


Figure 8



Figure 9 83755
General view (12,000X)

CRMC-MAD-000210



Figure 10 83756
General view (10,000X)

CRMC-MAD-000211



Figure 11 33757
General view (7,500X)

CRMC-MAD-000212



Figure 12 8375s
General view (19,000X)

CRMC-MAD-000213

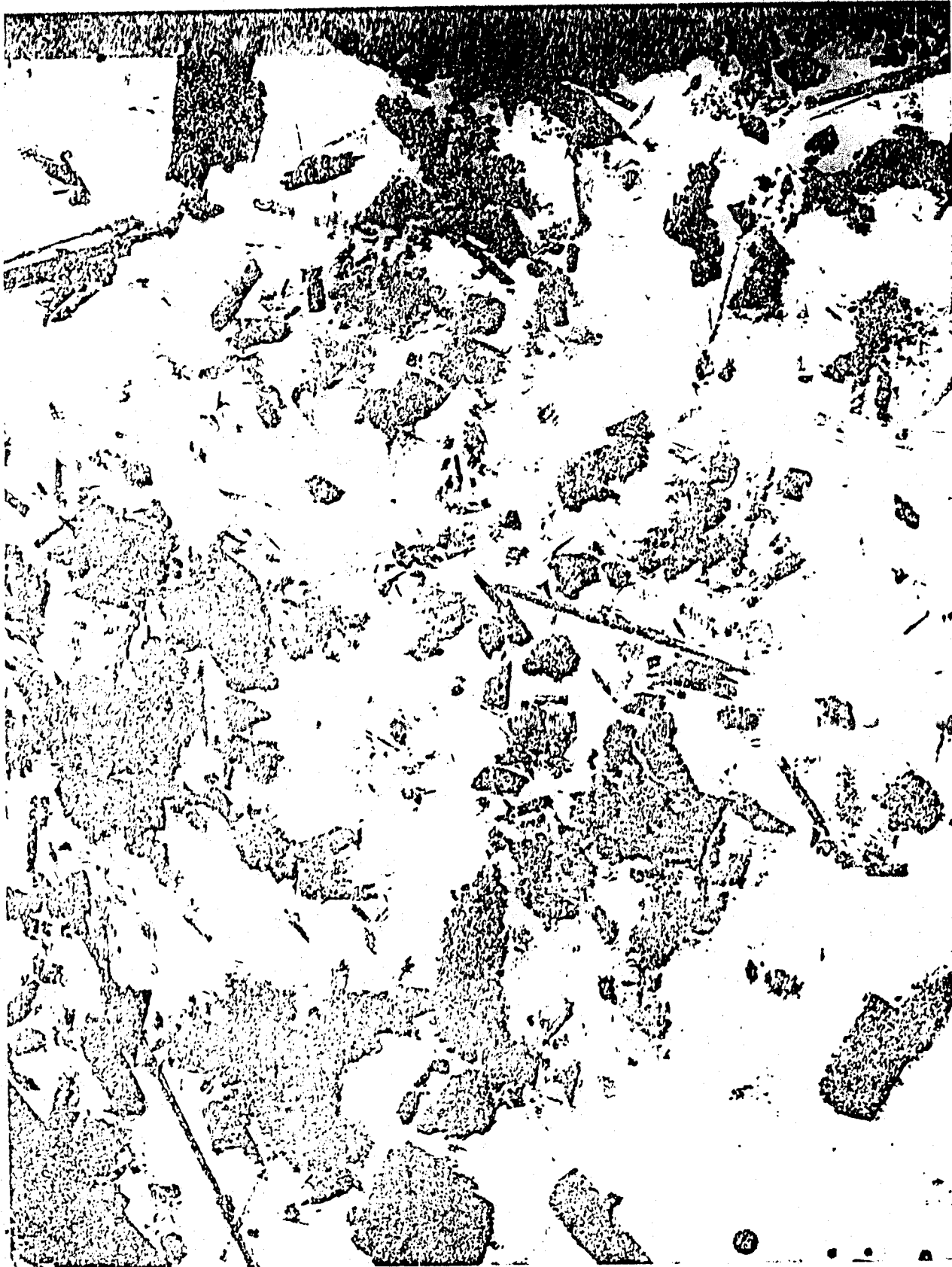


Figure 13 83759
General view (12,000X)

CRMC-MAD-000214

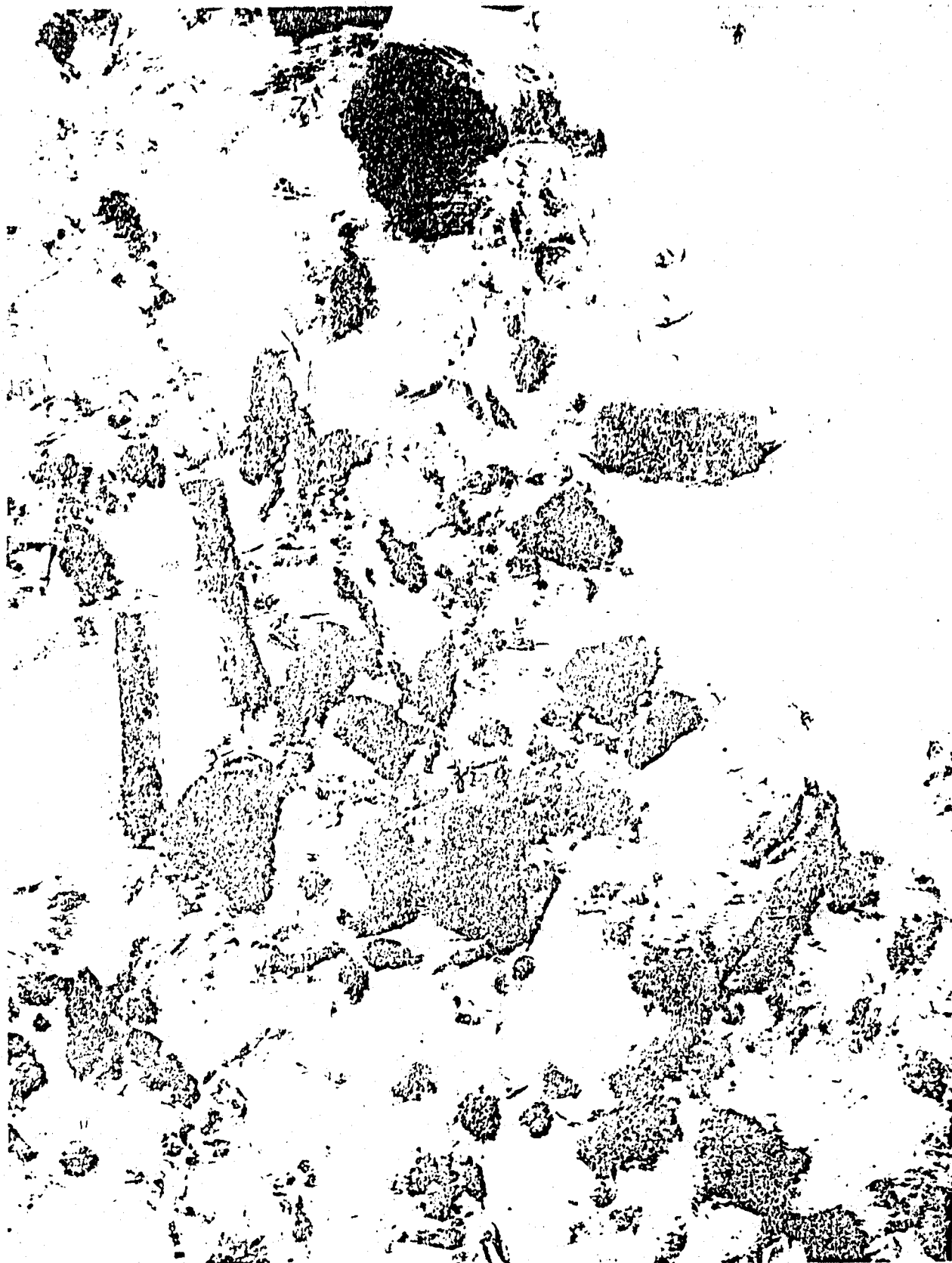


Figure 14 83760
General view (19,000X)

CRMC-MAD-000215



Figure 15 83760

General view (30,000X)

CRMC-MAD-000216



Figure 16 83761
General view (12,000X)

CRMC-MAD-000217



Figure 17 83761

General view (12,000X)

CRMC-MAD-000218



Figure 18 S3755
Tremolite fiber (30,000X)

CRMC-MAD-000219

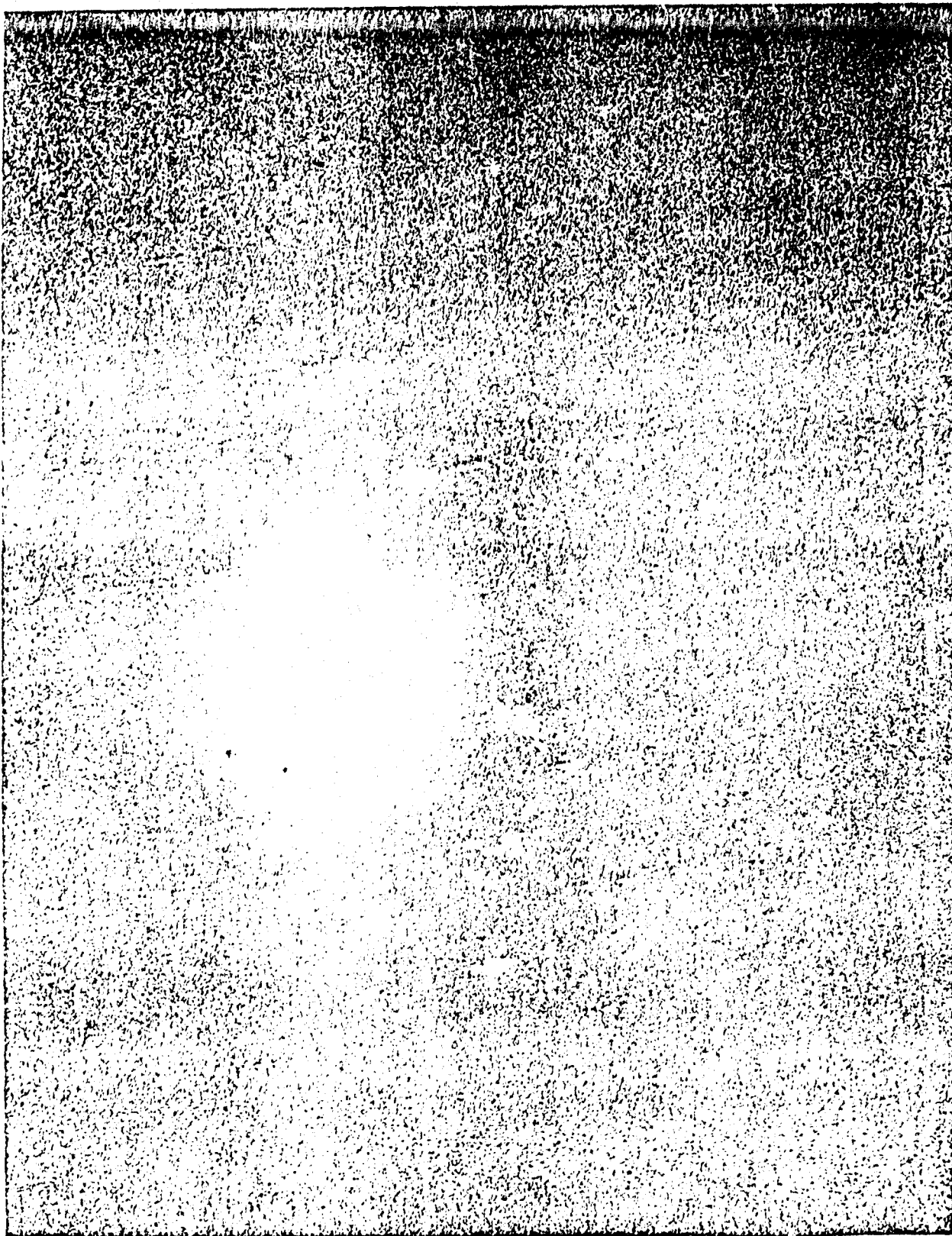


Figure 19 93755
Diffraction pattern of tremolite
fiber shown in Figure 18.

CRMC-MAD-000220



Figure 20 33753
Tremolite fiber (20,000X)

CRMCMAD-000221

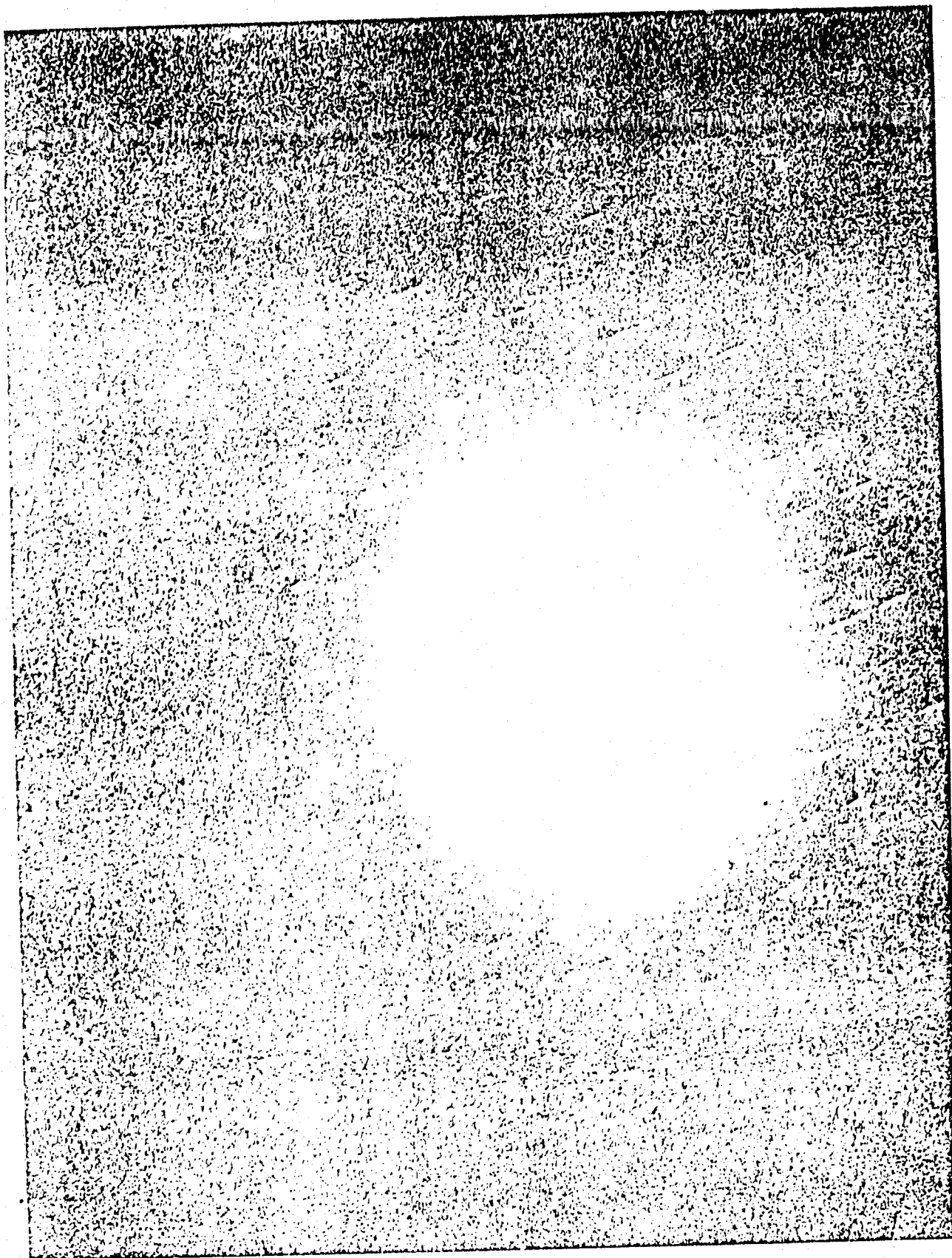


Figure 21 93755
Diffraction pattern of tremolite
fiber shown in Figure 20.

CRMC-MAD-000222



Figure 22 83755
Tremolite fiber (30,000X)

CRMC-MAD-000223

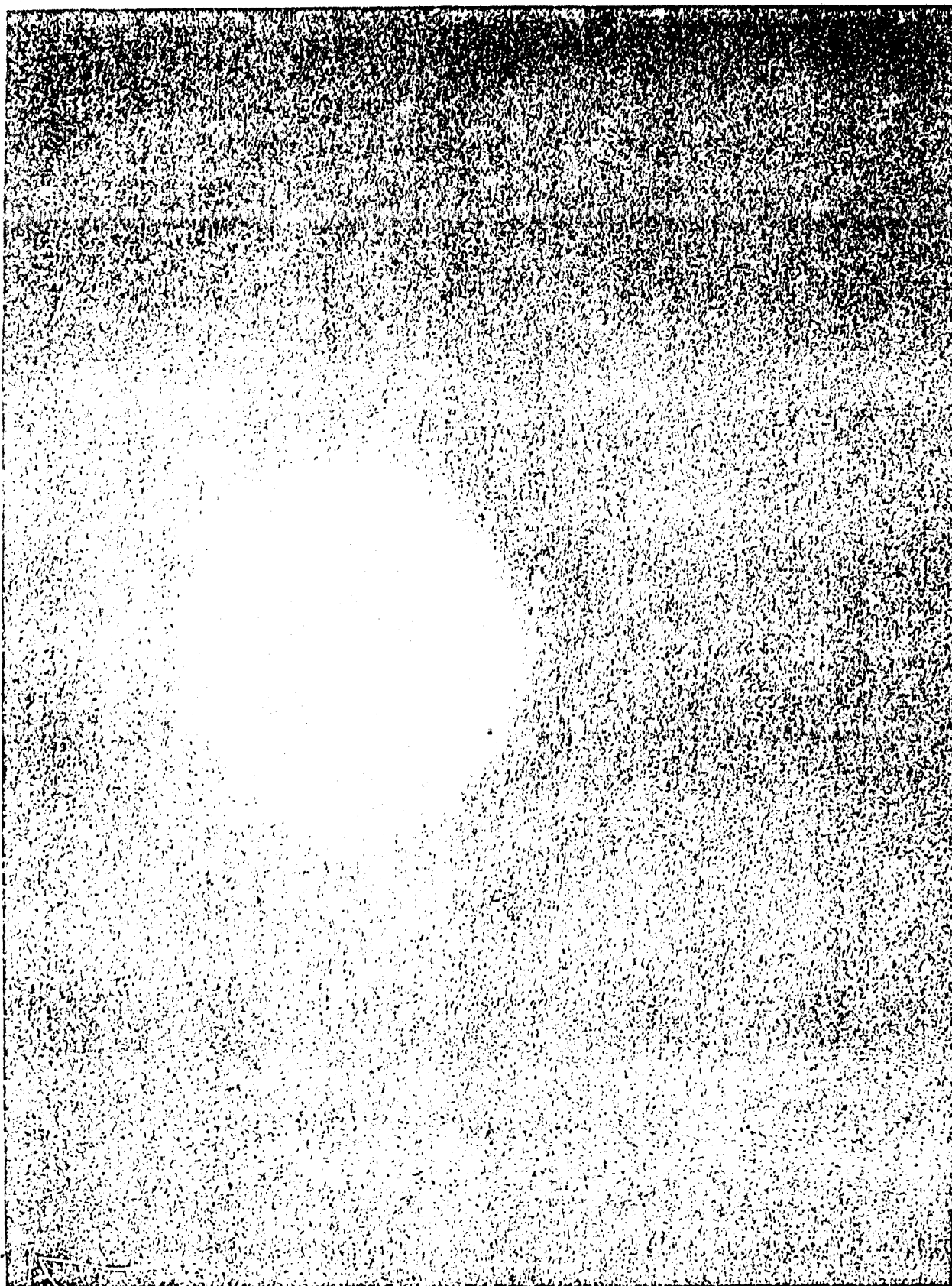


Figure 23 83755
Diffraction pattern of tremolite
fiber shown in Figure 22.



Figure 24 83757
Tremolite fibers (30,000X)

CRMC-MAD-000225

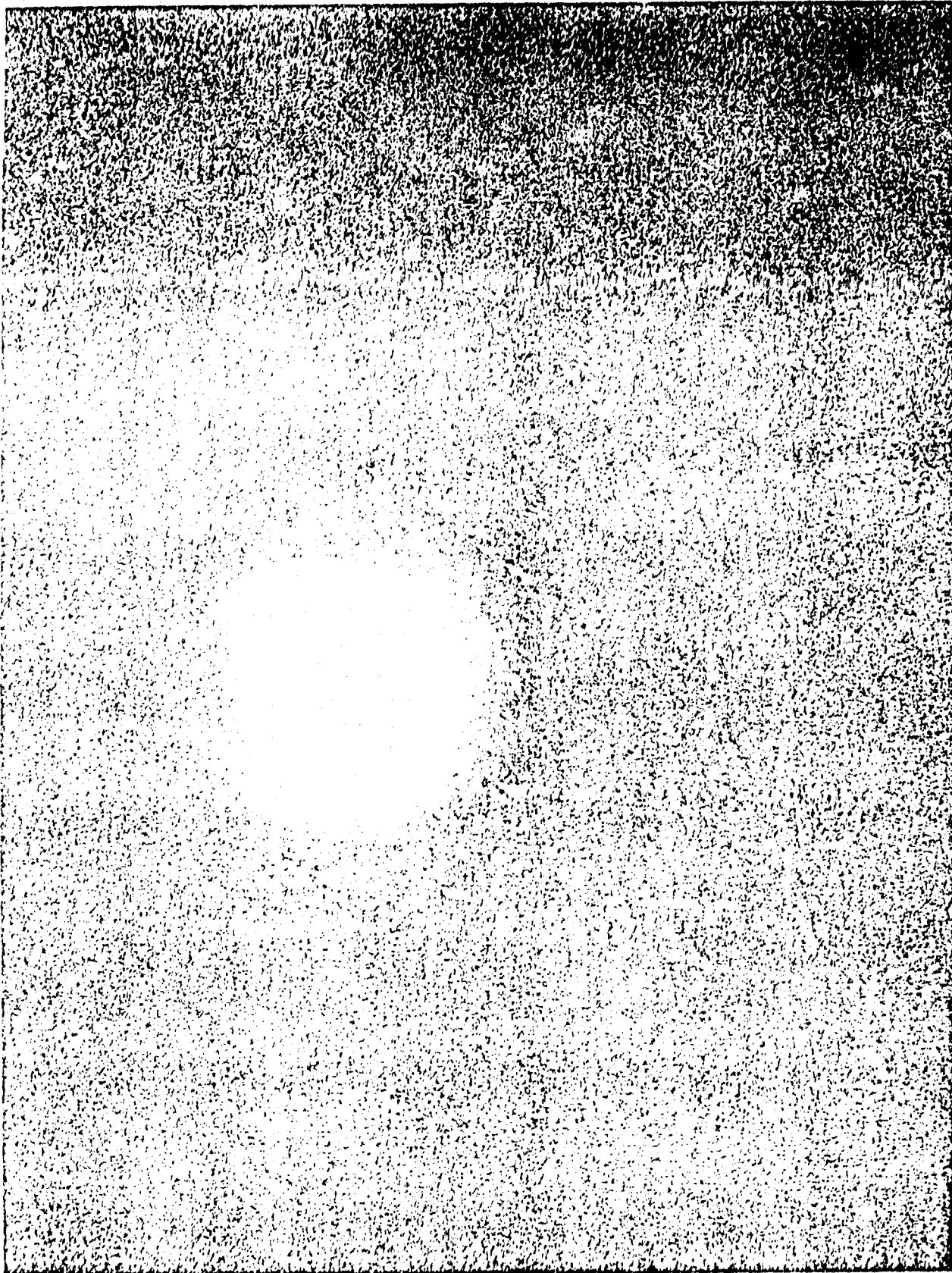


Figure 25 93757
Diffraction pattern of tremolite
fiber shown in Figure 24.

CRMC-MAD-000226

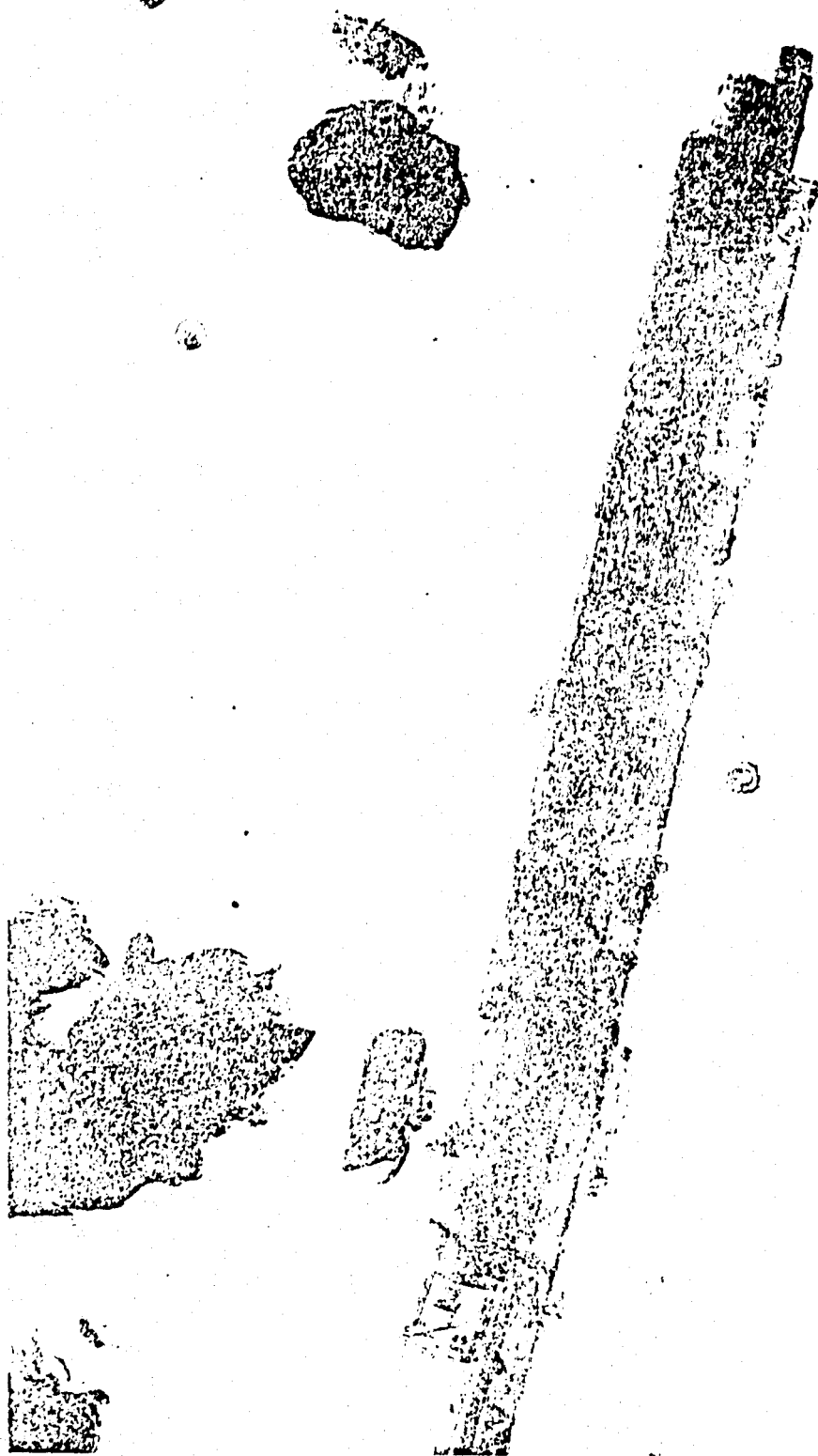


Figure 26 33757
Tremolite fiber (30,000X)

CRMC-MAD-000227

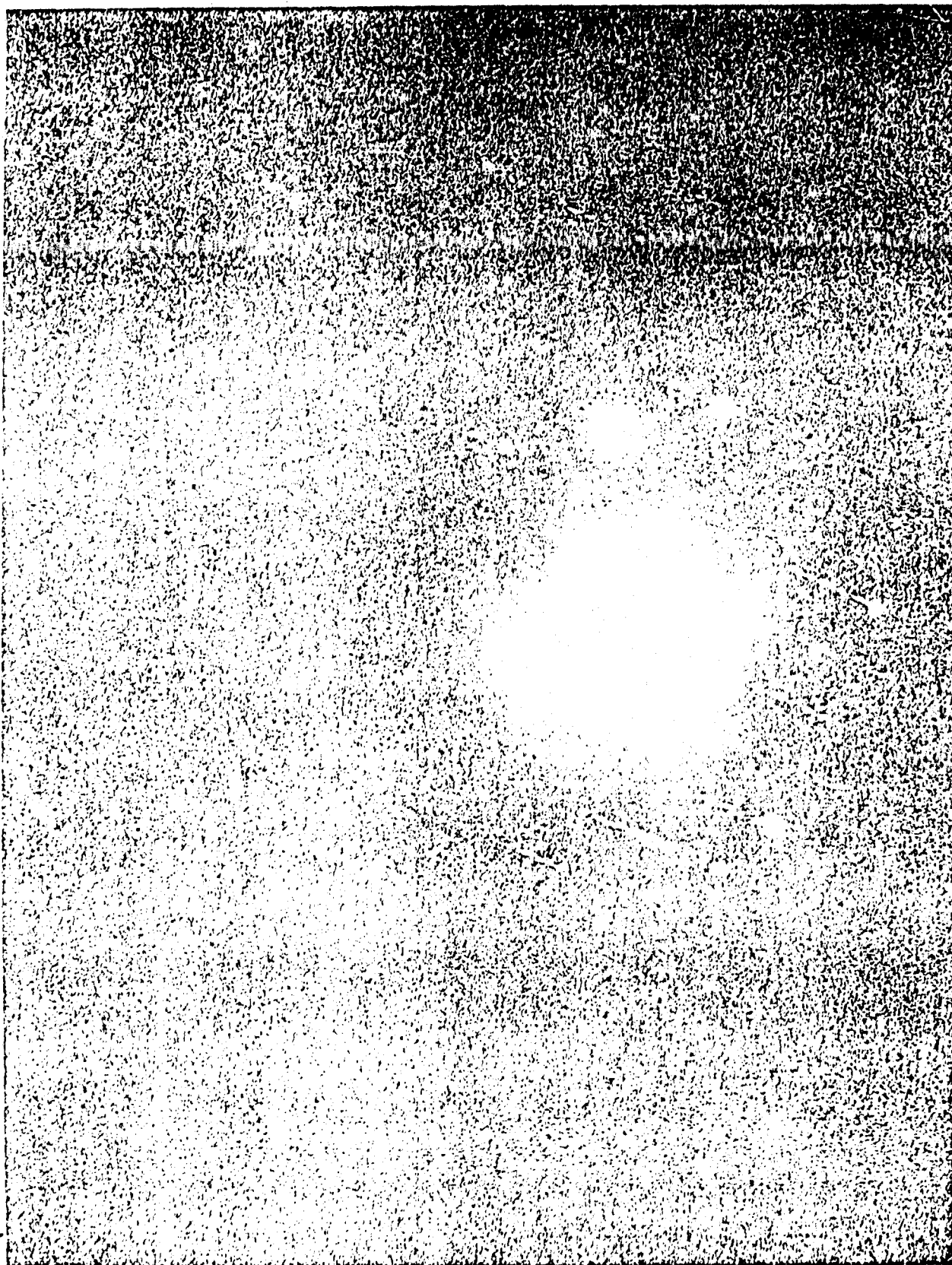


Figure 27 83757
Diffraction pattern of tremolite
fiber shown in Figure 26.

CRMC-MAD-000228

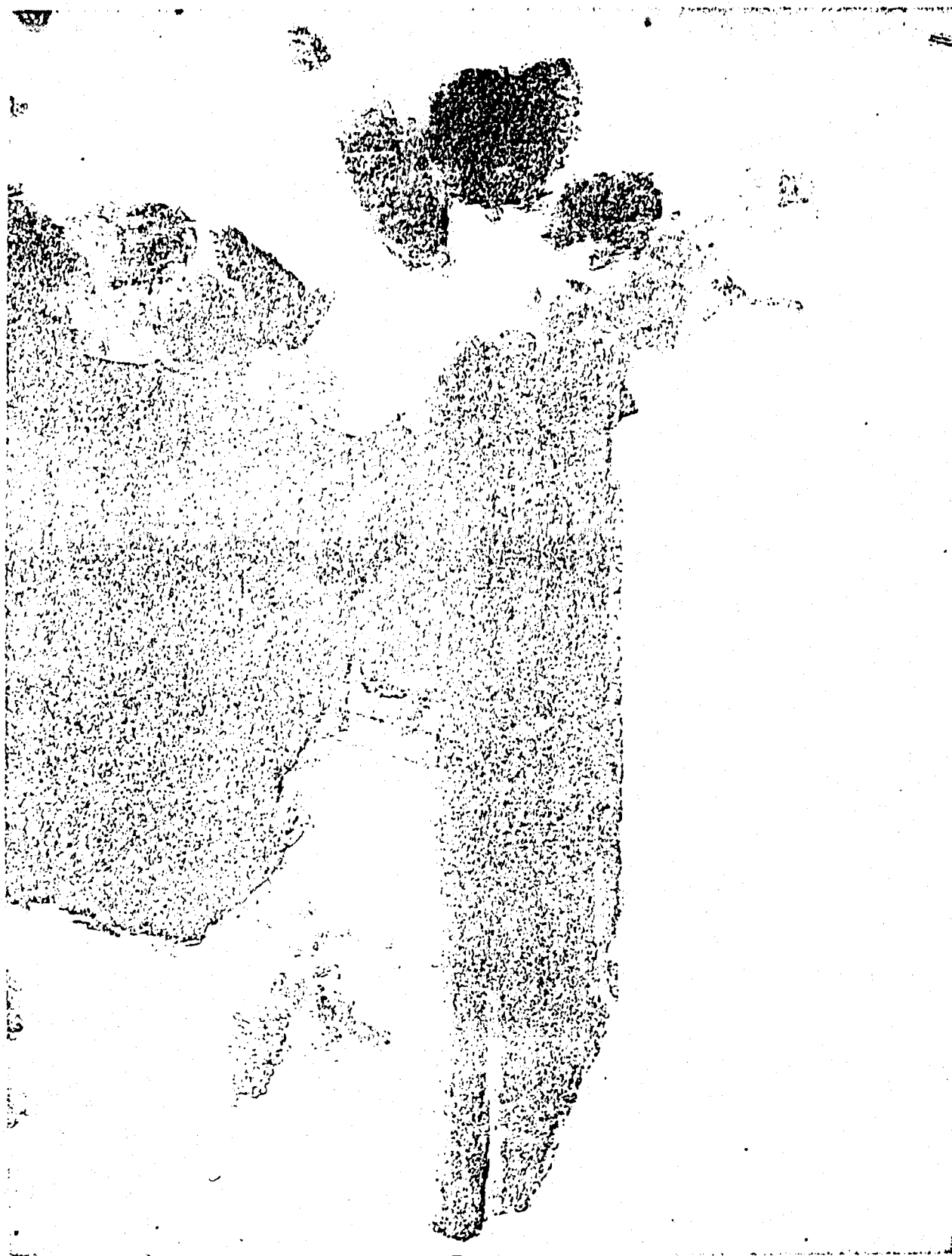


Figure 28 33753
Tremolite fiber (30,000X)

CRMC-MAD-000229

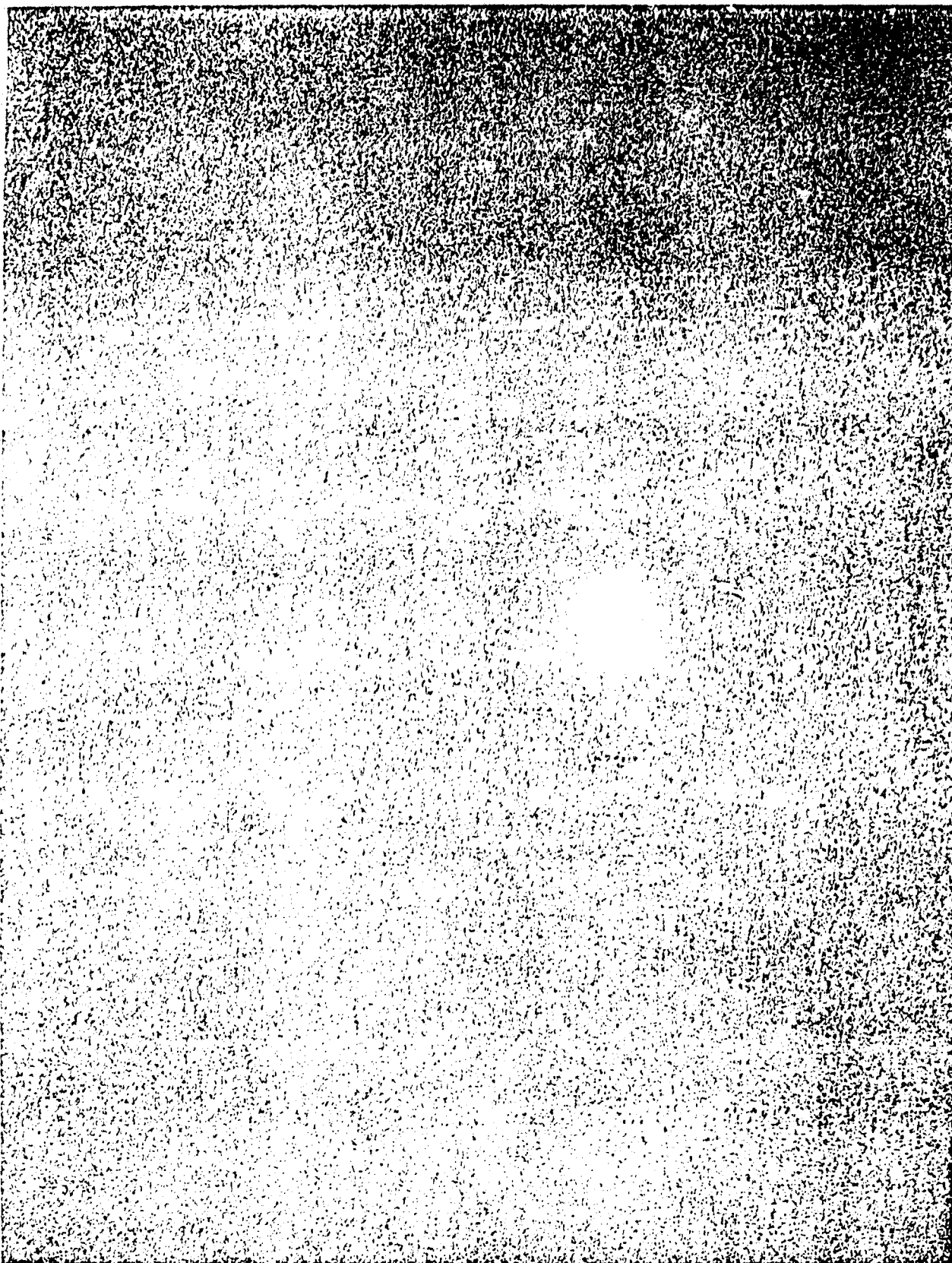


Figure 29 83753
Diffraction pattern of tremolite
fiber shown in Figure 28.

CRMC-MAD-000230



Figure 30 S3761
Tremolite fiber (30,000X)

CRMC-MAD-000231

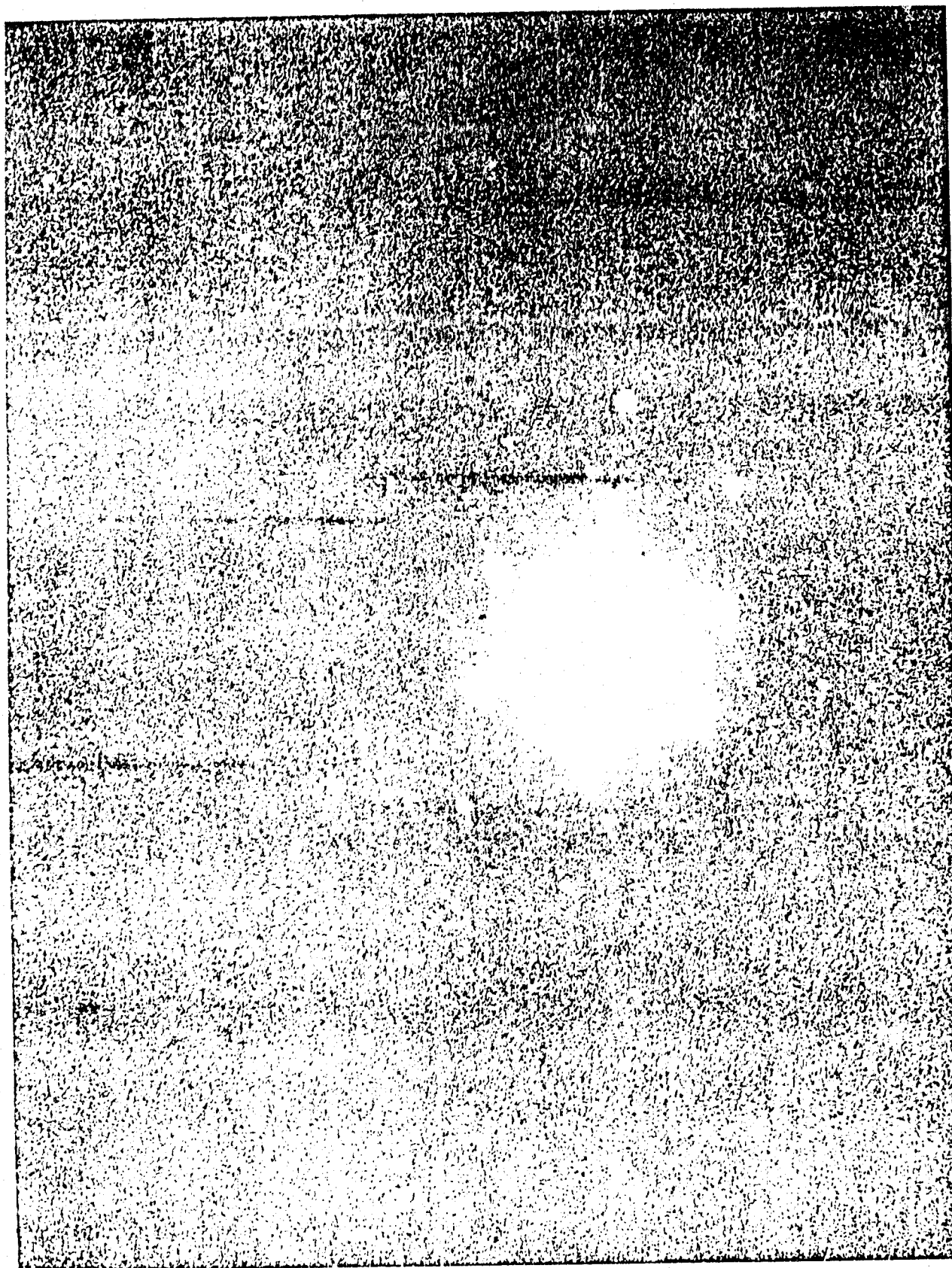


Figure 31 53761
Diffraction pattern of tremolite
fiber shown in Figure 30.

CRMC-MAD-000232

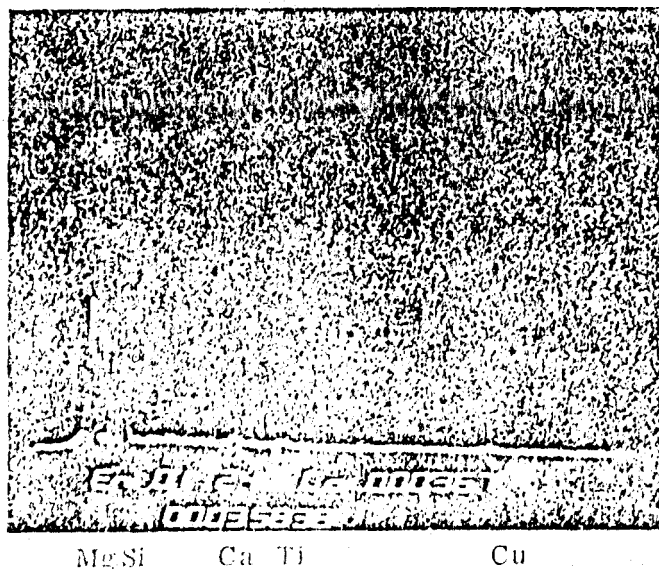


Figure 32 Sample 83755 - Probe of fiber in
photo 12A - Ti and Cu are background

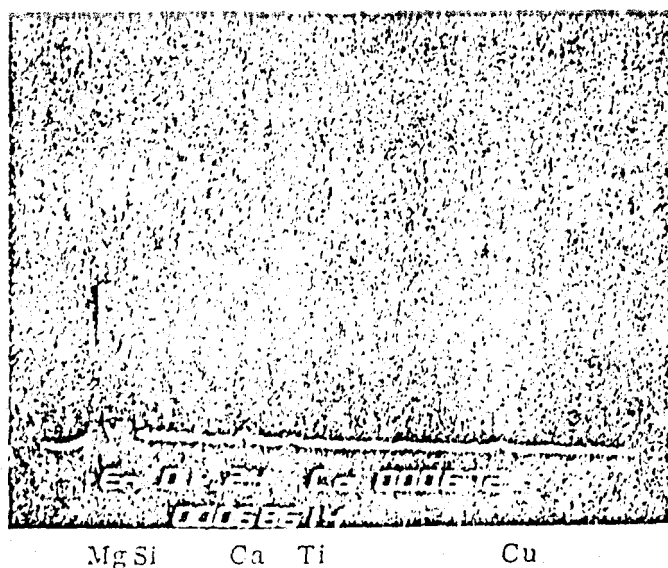


Figure 33 Sample 83756 - Probe of fiber in
photo 4A - Ti and Cu are background



Figure 34 Sample S3757 - Probe of fiber in
photo 9A - Ti and Cu in background

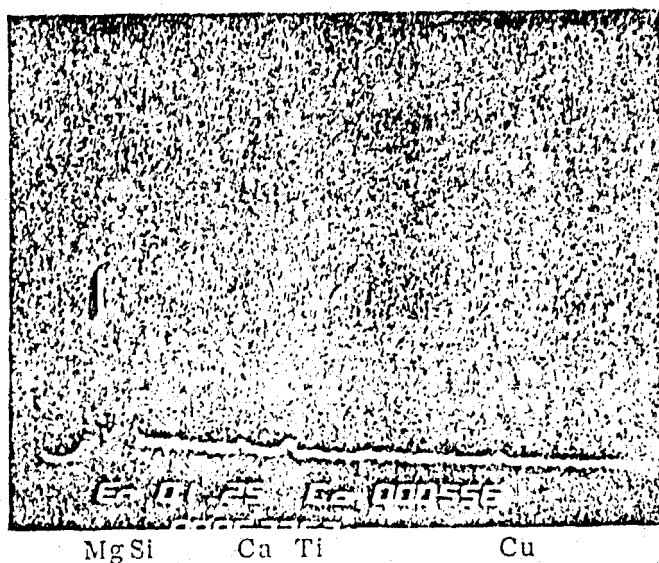
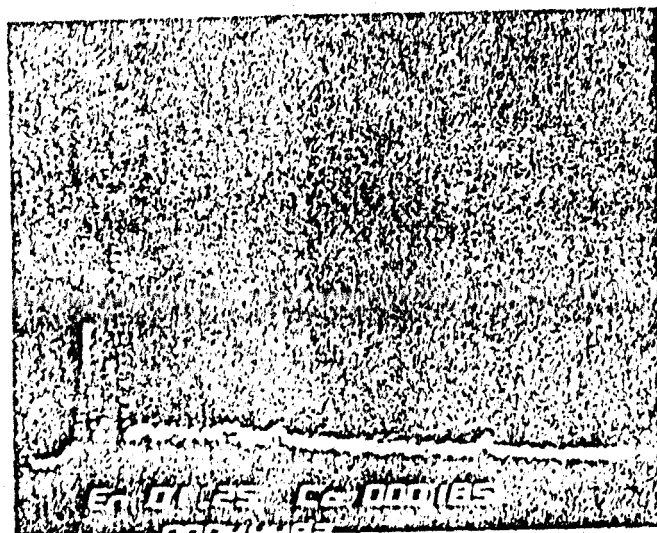


Figure 35 Sample 83753 - Probe of fiber in
photo 15A - Ti and Cu are background

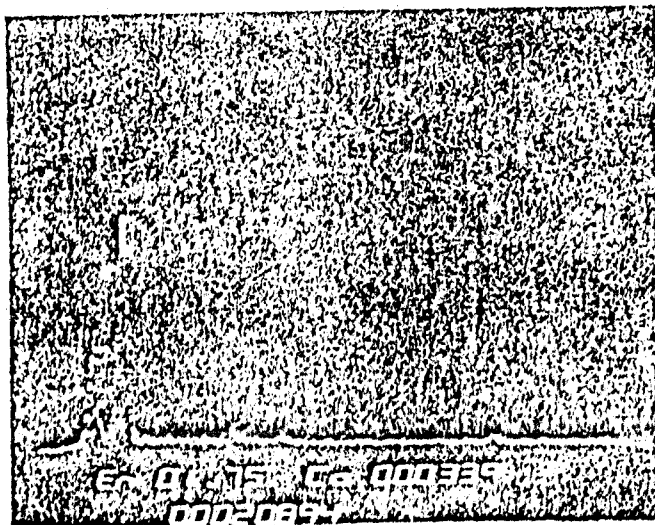


MgSi

Ti

Cu

Figure 36 Sample 83758 - Probe of platy material
Ti and Cu are background



Mg Si

Ca Ti

Cu

Figure 37 Sample 83759 - Probe of fibers in
photo 18A - Ti and Cu are background

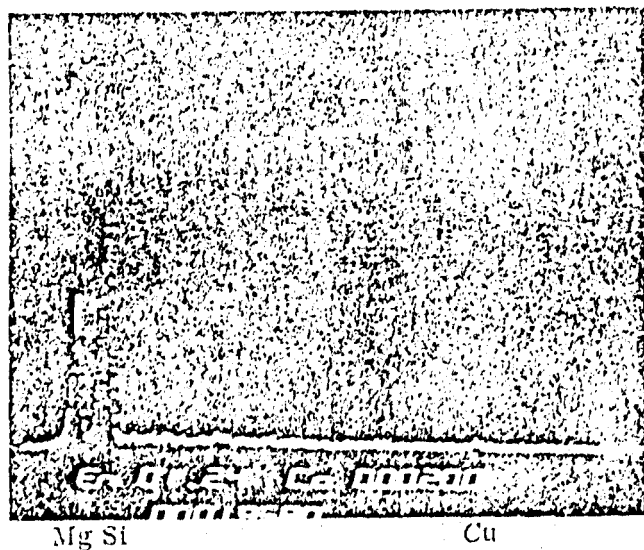


Figure 38 Sample S3759 - Probe of talc

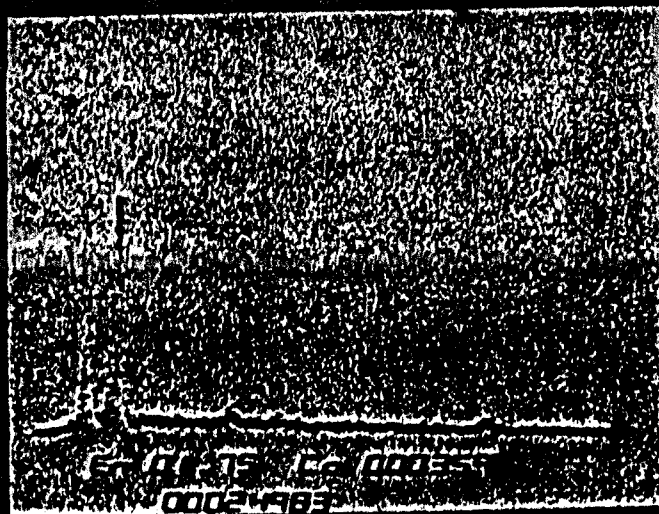


Figure 39 Sample 83760 - Probe of photo 21A fibers
'Ti and Cu are background'

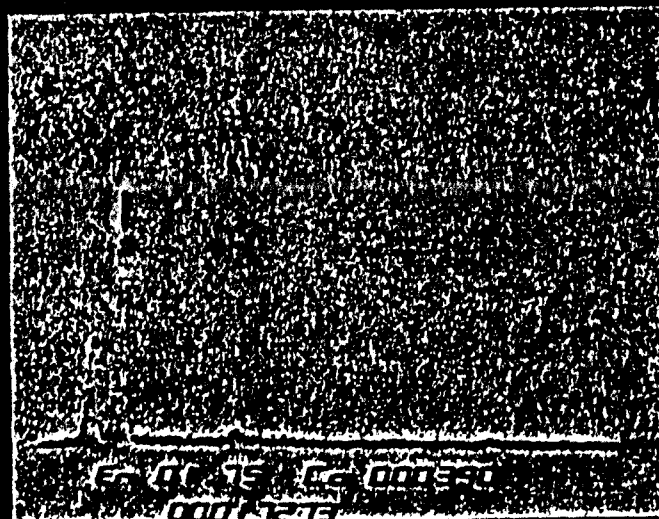


Figure 40 Sample 83761 - Probe of fiber shown in
photograph 24A

Desert Minerals, Inc.
January 25, 1973

F. J. Solon, Jr.
H. M. Jackson
E. M. Fenner
W. B. Reitze ✓
Dr. G. Wright
Dr. S. Speil
Dr. J. Leineweber
Dr. E. Marriner
R. P. Carter
W. L. VanDerbeek
P. A. Martinson
H. R. Keefe
R. S. Lamar
N. B. Scheffel
E. B. Smith

R. T. VANDERBILT ACTIVITIES FDA-OSHA REGULATIONS

On January 11 as arranged by Norman B. Scheffel, a meeting was held at the R. T. Vanderbilt New York offices to observe a presentation of the field by RTV to Government agencies concerning talc vs. asbestos. In attendance were Dr. Speil, R. S. Lamar, N. B. Scheffel, and E. B. Smith.

The presentation consisted of a series of slides as photomicrographs comparing Vanderbilt New York State talc (Nytal 100, 200, 300, 400), California talcs (Westal 101, 303, and 404), and beneficiated California talcs. Compared also were slides of asbestos minerals. In this presentation, it is the objective of Vanderbilt to establish that tremolite is non-fibrous and non-asbestiform in order to obtain an amendment or variance in the OSHA regulations to exclude tremolite. The presentation did contrast the particle shape of their talc mineral as compared to asbestos fibers but lacked any real scientific evidence to differentiate current definitions.

Vanderbilt has made this presentation to the New York State Bureau of Mines attended by Dr. Jacquelin Messite, Merley, Sheffield, and Stein. Kleinfeld not present due to his retirement. Vanderbilt has also made this presentation to Earl Goodwin at the U. S. Bureau of Mines. They have also made these presentation to EPA at Durham attended by Mr. Arthur Stevens, Deputy Director of the Bureau of Mines and Safety. Vanderbilt feels that they have cast some doubt on the definition and are hopeful to pursue Government agency toward a new definition of "commercial asbestos" as opposed to tremolite as an asbestos mineral. Vanderbilt has also been in communication with the A.S.T.M. Committee D-1-31-07 concerning extender pigment. Presentation made by Allan Harvey at Miami was oriented towards the removal of tremolite from the asbestos definition. It is their hope to obtain A.S.T.M. approval and use this approval with other Government agencies.

Vanderbilt has justifiably been reluctant to tackle NIOSH until more confidence is developed in their presentation. Dr. Speil was of considerable help at this meeting in pointing out the pitfalls and errors in Vanderbilt's thinking. It was concluded that the attack on tremolite vs. chrysotile must be medically oriented as opposed to a simple fiber definition or redefinition. Speil suggested that a more appropriate approach would be to obtain an exclusion

of tremolite based on scientific or medical reasons as opposed to a redefinition separating tremolite from chrysotile and/or asbestos. However, Vanderbilt intends to pursue the subject by enlisting the Talc Industry Association's help in developing an acceptable definition of talc, asbestos, etc. at the meeting scheduled for February 5 in New York. In view of the expertise obtained by J-M people in this mineralogical area and the Government communications area, we urge that Dr. Speil and additional environmental people at J-M attend the February 5 meeting in New York.

Attached to this memo are some definitions that Bob Bacon has extracted from various encyclopedias and from the Federal Register concerning asbestos fibers. It is in this direction that RTV intends to proceed. We certainly question this attack and increased help from J-M to guide this program properly and scientifically and not to the detriment of the talc industry.

Earl B. Smith

EBS:cks

Greenwood Plaza - 1 North
January 31, 1973

EJE		RSL		RFB	
EBS	✓	NBS		SRM	
TER		JEC		DEN	
B J 13, 1					
T		AJM		KJB	
NON		DHM		TJF	

P. A. Martinson - 2 West

YOUR MEMO OF JANUARY 23, 1973
TALC PRODUCER'S ASSOCIATION (PROPOSED)
R. T. VANDERBILT COMPANY

Attached is a proposed draft of a letter which is intended to indicate our (J-M) stand on this subject. We agree that this should probably go out over F. J. Solon's signature. We feel most strongly, however, that both S. Speil and W. C. Streib should approve of the technical soundness of the letter before it is sent.

We believe that the letter should go to the presidents of all of the talc producers in the United States, to the Talc Producer's Association, and to the appropriate A.S.T.M. Committee.

R. S. Lamar

R. S. Lamar

ain

cc:

W. L. Vanderbeek - 2 West
F. J. Solon - 1 West
H. R. Keefe - 2 West
E. B. Smith - Long Beach, Carson ✓
R. F. Bassett - Long Beach, Carson
S. Speil - 3 West
W. C. Streib - 3 West
R. P. Carter - 5 West
J. M. Sharratt - 2 West

CRMC-MAD-000242

*Solidarity House*8000 EAST JEFFERSON AVE.
DETROIT, MICHIGAN 48214
PHONE (313) 920-5000

FEB 9 1976



INTERNATIONAL UNION, UNITED AUTOMOBILE, AEROSPACE & AGRICULTURAL IMPLEMENT WORKERS OF AMERICA-UAW

LEONARD WOODCOCK, PRESIDENT

EMIL MAZEY, SECRETARY-TREASURER

VICE-PRESIDENTS

PAT GREATHOUSE • KEN BANNON • DOUGLAS A. FRASER • DENNIS McDERMOTT • IRVING BLUESTONE • ODESSA KOMER • MARC STEPP

February 2, 1976

Mr. Peter Brown, Staff Manager
Standards Development Division
ASTM
1916 Race Street
Philadelphia, Pennsylvania 19103

Dear Mr. Brown:

I would like to express my disagreements with the apparent ASTM consensus expressed in comments on the proposed OSHA rules on asbestos. These comments were submitted on behalf of Committee E-34.

There are many items in the comments with which I disagree. Given the shortness of time, I will concentrate on Sections 3 and 12. The original OSHA asbestos standard was essentially an asbestosis standard tracking the British regulations (NIOSH, 1972).

That 2 fibre/cc asbestos standard was based on a single British study which found that this level would reduce asbestosis below 1%. (British Occupational Hygiene Society, Ann. Occ. Hyg. 11 47 (1968)). Review of this data by Lewinsohn, the company physician, found more cases of asbestosis than previously reported. (H. Lewinsohn, Royal Soc. Health J., 92, 69 (1972). Dr. McDonald reported considerably lower incidence of disease with exposure levels than other investigators. (McDonald, et al, Arch. Env. Health, 28 61 (1974)). McDonald's work is controversial and at odds with the work of other researchers. This paragraph should at least face the issue of the bulk of data such as those reported by Selikoff (Selikoff, et al, Proc. of Lyons Conference, 1972, 209).

This standard was not proposed to protect against the carcinogenic action of asbestos. The reports by Selikoff of asbestos-related cancers and even lung disease among families of asbestos workers, due to a take-home effect, indicate that low levels of exposure are indeed a cause for concern (Anderson et al, N.Y. Acad. Sci., in press).

CRMC-MAD-000243

American Society for Testing and Materials
Committee E 34
Task Group on Naturally Occurring Inorganic Fibers
Minutes of the 16th meeting

New York Airport
2 March 1977

PRESENT

The list of those present is presented in Annex 1

AGENDA

The agenda is presented in Annex 2

BUSINESS

16.1 Chairman's opening remarks

16.1.1 It was announced that the meeting hall was sponsored by the R.T. Vanderbilt Co. Ltd. Appreciation was extended on behalf of the Task Group

16.1.2 It was mentioned that excuses for absence had been made by the following members: G.F.A. Brink, W.K. Cooling, M. Grimmard, P.A. Filteau, and J. L. Poutre.

16.2 Minutes of the last meeting

16.2.1 Photocopies of hand-written minutes were distributed, with apologies. The minutes were read.

16.2.2 These minutes were adopted, as read.

16.3 Business arising from the minutes

16.3.1 Objections were raised with regard to item No. 15.7.3 concerning the suggestion to replace the monitoring method by a reference to the NIOSH method. This suggestion was firmly opposed on the basis that the NIOSH method was inadequate, and that the proposed monitoring method, as presented in Annex A3, differed significantly on the following points:

Section A3.1.3 Regarding aspect ratio.

Section A3.3.2 Concerning the need to verify whether or not the fibers counted are asbestos.

Section A3.4 With regard to definitions.

Section A3.5 With regard to criteria for identification.

Section A3.9.2 About the mounting technique.

16.3.1.1 Accordingly, it was resolved to retain the present monitoring method.

16.3.2 Concerning item 15.3.19.1 in the minutes of the previous meeting, concerning justification for a double standard, it was suggested that the standard be justified on the basis that OSHA enforces a two-fiber limit for manufacturing and end-use applications while MESA enforces a five-fiber limit for mines and mills. This suggestion was not adopted.

16.3.3 It was proposed that the statements in the minutes of the previous meeting (15.3.19.1 mentioned above) be modified by stating the facts that reliable epidemiological data exist for mines and mills, and that the standard will remain under continual review.

16.3.4 Further to Section 16.3.1 above, last item concerning the mounting technique, it was stated that in practice, the OSHA enforcement laboratories use a variant of the NIOSH method. It was also reported that NIOSH teaches a somewhat different method when training technologists from industry in the techniques of fiber counting, at Cincinnati. The possibility that NIOSH may have changed their methodology at the laboratory level, was raised. The Recording Secretary was directed to enquire about this from Dr. J. Finkle, Director of NIOSH.

16.4 Letter ballot on exposure limits, and adoption of the Standard on occupational Exposure to Asbestos.

16.4.1 It was announced that the ballots had not yet been fully returned; having been mailed only recently.

16.4.2 It was resolved that the following action would be taken depending upon the outcome of the letter ballot:

16.4.2.1 If the ballot favors a five-fiber limit, the statements on exposure limits such as contained in the ninth draft would be adopted.

16.4.2.2 If the ballot favors a two-fiber limit, then statements on exposure limits such as contained in the tenth draft would be adopted.

16.4.2.3 If the ballot favors a dual limit, then a statement calling for a five-fiber limit in mines and mills, and a two-fiber limit in manufacturing and end-use industries, would be adopted with a statement to the effect that the threshold limit value can be more closely approached in mines and mills because of the availability of reliable epidemiological data.

16.4.3 It was proposed that Section 5.2.1.1 of the tenth draft be revised to eliminate the requirement for initiating medical surveillance at one half of the exposure limit. It was argued that this in effect creates an additional more stringent standard. This proposal was adopted by the Task Group but it was felt that this decision would have to be confirmed by a letter ballot of the Task Group. Accordingly, the Recording Secretary was directed to mail out such a letter ballot.

16.5 Regulatory situation in England.

16.5.1 It was reported that organized labor in England has begun to react against unnecessarily stringent regulations on asbestos exposure. A newspaper article that appeared in the Daily Telegraph on 24 February 1977 was mentioned (refer to Annex 3).

16.6 Centers for the study of microscopic mineral particles.

16.6.1 It was announced that the U.S. Bureau of Mines had created a Unit for Study of Microscopic Mineral Particles, at College Park, M.D. It was explained that the main purpose of this organization was to identify minerals for regulatory purposes. It was added that their first task would be the identification of asbestos fibers.

16.6.2 General approval was voiced.

16.6.3 It was reported that the EPA (Environmental Protection Agency) have endorsed this endeavor.

16.6.4 It was also reported that Tibor and Zoltai of the University of Minnesota, strongly favor the establishment of this unit.

16.6.5 Refer to Annex 4 attached hereto for complete details.

16.6.6 The initiative of the USBM in setting up the particulate mineralogy unit was commended, and it was resolved unanimously that this Task Group favor, and recommend the establishment of similar groups with similar objectives, and personnel, internationally.

16.7 Old business

16.7.1 It was stated that the two-fiber exposure limit used as a guideline in Ontario, Canada, was not a regulation, and had not been adopted as a law. It was added that only one asbestos producing plant operated under this guideline. The opinion was expressed that the operation in question could not possibly continue to operate economically under such severe constraints.

16.7.2 It was agreed that Section 2.2.1 of the Rationale Supporting the Selection of a Dual ASTM Standard should be modified accordingly.

16.3 New business

16.3.1 Mention was made of a publication by G. Sarkis and Amptian 'Asbestos Minerals and their Monasbestos Analogs' presented at the conference on Electron Microscopy of Microfibers, at Penn State University 23-25 Aug 1976.

16.3.2 The correct address of Mr. W.H. Ashton was given as follows:

W.H. Ashton
Director of Geotechnology
Johnson & Johnson
Research Division
US Route 202
Raritan, N.J. 08869
Tel.: 201-524-1475

16.9 Date and place of the next meeting.

16.9.1 It was resolved to hold the next meeting of the Task Group with the main meeting of ASTM Committee E 34 at the Sheraton Hotel, in Philadelphia, PA on 18 April 1977. It was agreed that endeavors would be made so that the Task Group could meet a half day prior to the subcommittee meetings.

16.9.2 Editorial note: It was subsequently decided to meet on Monday, 18 April 1977 from 8:30 to 12:00 a.m. in addition to meeting on Tuesday, 19 April.

ANNEX 1

ATTENDANCE

Sixteenth meeting of the Task Group on Naturally Occuring Inorganic Fibers of ASTM Committee E 34, at the JFK airport in New York, N.Y., 2 March 1977.

W.H. Ashton
M. Cossette

A.M. Harvey
C.S. Thompson
A.A. Winer

- Johnson & Johnson, Research Dir.
- University of Sherbrooke
Recording Secretary
- R.T. Vanderbilt Co. Ltd.
- R.T. Vanderbilt Co. Ltd.
- INET/CAHMET, Ottawa, Ont.
Chairman

ANNEX 2

ACPH Committee E-34

Task Group on Naturally Occurring Inorganic Fibers

AGENDA

16th meeting

2 March 1977
JFK Airport
New York, N.Y.

1. Chairman's opening remarks
2. Minutes of the last meeting
3. Business arising out of the minutes
4. Letter ballot on exposure limits and adoption of the Standard on Occupational Exposure to Asbestos.
5. Regulatory situation in England.
6. Centers for study of microscopic mineral particles.
7. Old business
8. New business
9. Date and place of the next meeting

8 The Daily Telegraph, Thursday, February 24, 1977

TUC SAFETY LIMIT FOR ASBESTOS TOO LOW, SAYS UNION

By JOHN DUNSFORD

THE TUC recommended asbestos safety limit is too low and could wipe out the industry and create havoc throughout the economy in sectors where asbestos products are used, a union claimed yesterday.

The Association of Professional, Executive, Clerical and Computer Staff (APEX) said the limit puts thousands of jobs at risk.

The union has decided to set up its own advisory committee in opposition to the TUC's main recommendations on asbestos.

It also accused the TUC of submitting "unnecessary, unrealistic and unsubstantiated" recommendations to Government.

The TUC has urged an eventual total ban on asbestos products and, as an immediate measure, the introduction of a maximum allowable concentration of 0.2 fibres per millilitre (F/Ml) of air.

The union claims the "higher but still safe" level of two fibres per millilitre should be laid down as the legal maximum in a working environment.

Costs of £60 million.

The 0.2 level would probably cost TBA Industrial Products, of Rochdale, one of the world's biggest manufacturers of Asbestos, more than £50 million in adapting existing production methods, "an impossible figure," the union claims.

"It is an unachievable level

and, if introduced, would mean the end of the asbestos industry," said Mr Peter Goodwin, APEX north west area organiser. Some 20,000 jobs, at all grades, would be lost in the region alone.

Mr Keith Standing, the union's national executive secretary, said APEX had dissociated itself from the TUC's findings and has proposed a re-examination of methods used to establish links between health hazards in the asbestos industry and to "ensure its facts are indeed facts."

The union claims the TUC arrived at its findings by only studying reports about asbestos itself to establish or check facts.

The Health and Safety Commission's recent interim report on health hazards and precautions involving asbestos had recommended 2 millilitres as the permitted maximum occupational exposure level to most asbestos dusts.

It recommends an exposure ceiling of only 0.2 millilitres for "blue" asbestos, or Crocidolite the import of which has now been banned.

CRMC-MAD-000250

DEPARTMENT of the INTERIOR

news release

BUREAU OF MINES

For Release November 15, 1976

Alan Cole (202) 634-1006

MINES BUREAU UNIT FOR STUDY OF MICROSCOPIC MINERAL PARTICLES ESTABLISHED AT COLLEGE PARK, MARYLAND

Studies of microscopic mineral particles using specialized scientific disciplines that can clearly identify such potentially harmful substances as asbestos, and distinguish them from thousands of other mineral particles, will be performed by a new research unit just established at the College Park (Md.) Metallurgy Research Center of the Interior Department's Bureau of Mines.

Formation of the new group was announced today by Bureau of Mines Director Thomas V. Falkie. He said the Bureau's recognized expertise in particulate mineralogy will be used "to help clarify a situation, with environmental and health implications, that so far has been characterized more by confusion and ambiguity than by reason and fact."

"The best-known environmental questionmark in particulate mineralogy is asbestos," Dr. Falkie said. "The entire field has been riddled by the extreme lack of precision with which the term 'asbestos' has been used."

"In many instances," the Director said, "non-asbestos mineral particles have been mistaken for microscopic fibers of related asbestos minerals. The Bureau's new particulate mineralogy unit has been assigned to clear up such confusion wherever it can, by replacing misinformation with fact. Its job is to develop a solid scientific basis for research into particle-related pollution problems and for the process of decision-making by regulatory bodies."

Dr. Falkie said the particulate mineralogy unit, besides helping in the Bureau's own minerals research, will serve as a focal point for identification of particulates involved in regulatory and research activities of Federal, State, and local agencies. Whenever technical information about the nature of asbestos and other mineral particulates is needed, such agencies can consult directly with the College Park staff, without going through the Bureau's main headquarters offices in Washington, D.C.

(more)

CRMC-MAD-000251

MILLIPORE

Recommended Practice

Procedure for rendering MF-Millipore (mixed esters of cellulose) and Celotate (cellulose acetate) membrane filters transparent.

1. Scope:

This procedure provides a chemical clearing technique that yields a transparent membrane permanently affixed to a glass slide and because of the nature of the clearing procedure, the contamination is also permanently affixed to the membrane resulting in a permanent sample.

2. Outline of Method:

Contaminants must be collected on a MF-Millipore (white or black plain) or Celotate membrane disc where vacuum has been used to impinge the particles upon the surface of the filter. The filter disc is rendered transparent by dissolution, thus, the particles can be observed using transmitted light microscopy.

3. Apparatus:

- A) Glass slides 2" x 3" (for 37 and 47mm filters)
Millipore Catalog # XX10 076 15
- B) Filter forceps, stainless, smooth-tip
Millipore Catalog # XX62 000 06
- C) Eyedroppers with rubber bulbs
- D) Watchglass (diameter greater than 47mm)
- E) Glass Syringe (50-100ml)
- F) Micro-syringe, Luer inlet, 25mm
Millipore Catalog # XX30 025 00
- G) Fluoropore membrane filters (pore size 0.2µm)
Millipore Catalog # FGLP 025 00
- H) Large diameter petri dishes

4. Reagents:

A) Clearing Solution A

33mls Hexane, Technical Grade

33mls 1, 2-Dichloroethane, Technical Grade

33mls 1, 4-Dioxane, Technical Grade

B) Clearing Solution B

Acetone, Technical Grade

5. Filter Clearing Procedure:

- A) Filter clearing solution A using FGLP (0.2µm pore size) filter into pre-cleaned container.
- B) Using an eyedropper, freshly rinsed with a filter solvent (Freon®TF is recommended), dispense sufficient clearing Solution A to thoroughly wet a cleaned 2" x 3" microscope slide.
- C) Carefully roll the dry test filter particle side up, onto the pre-wetted glass slide. (Caution: do not release membrane on this slide.) Immediately roll the wet filter onto a clean, dry glass slide and cover the glass petri dish.
- D) After 30 seconds, remove the glass petri dish and invert the sample over a watch glass half filled with acetone. Allow the sample to become completely transparent (2 to 5 minutes exposure time to the acetone vapors).
- E) Remove the sample from the watch glass and place on a level surface covering it with the petri dish.
- F) Allow the filter to dry 2 to 5 minutes at room temperature. Filter is now ready for analysis.

ABSTRACT *

NIHNS ORAL ASBESTOS STUDIES

John A. Moore, D.V.M.

Epidemiologic data clearly associates inhalation of asbestos with an increased incidence of cancer. In addition to pulmonary and thoracic neoplasia, there is data which associates an increased incidence of gastrointestinal and peritoneal tumors. Controversy exists as to whether these latter types of neoplasia result from asbestos fibers that were ingested subsequent to clearance from the respiratory system. Exposure to ingested asbestos does occur in the general population through the presence of fibers in water and food.

The NIHNS oral asbestos studies in rats and hamsters represent a systematic attempt to assess the biological effects associated with primary ingestion of selected asbestos fibers. The objectives of the studies include: assessment of biological (carcinogenic) effects as a consequence of exposure to one of several types of asbestos; assess if an interaction may exist between a chemical carcinogen which is known to produce bowel cancer and ingestion of asbestos. The specific experimental design of this series of ongoing studies will be presented.

*To be presented at the Workshop on Asbestos: Definitions and Measurement Methods, July 18-20, 1977, National Bureau of Standards, Gaithersburg, Maryland

CRMC-MAD-000254

There is strong evidence that associates occupational exposure to chrysotile, amosite, and crocidolite to a resulting high incidence of lung cancer. Exposure to these forms of asbestos has also been observed to result in an increased incidence of pleural and peritoneal mesothelioma and an excess risk of gastrointestinal cancer. Environmental exposure to asbestos through living in the neighborhood of asbestos factories or mines or through residing in households of asbestos workers also correlates with increased mesotheliomas (IARC Monograph on Asbestos, Volume 14, 1977).

It is plausible to speculate that the increased incidence of gastrointestinal cancer in occupationally exposed populations may be a consequence of asbestos fiber ingestion. Fiber ingestion in these circumstances may result through the swallowing of fibers cleared from the nasal or tracheobronchial tree. Direct ingestion of fibers deposited in the oral cavity also occurs.

Exposures of the general population to asbestos occurs through ingestion of materials and substances that contain fibers. For example, several million fibers per liter were found in Canadian tap water (Cunningham and Pontefract, 1971); Great Lakes and St. Lawrence River water showed average concentrations of about 1.7 million asbestos fibers per liter (Cook et al., 1974); water collected from the north shore of Lake Superior in the Silver Bay/Duluth region were found to have even higher fiber levels. A number of studies have reported the appearance of asbestos fibers in commercial

beverages such as beer, vermouth, and soft drinks (Cunningham and Pontefract, 1971). The fibers found in these products may be a result of the use of asbestos filters used in their preparation (Cunningham and Pontefract, 1971). Food may contain asbestos through the use of asbestos filters or the use of talc, which has an asbestos impurity (Merliss, 1971; Wolff and Oehme, 1974).

In response to a growing concern about the possible biological effects of ingested asbestos, a conference was held in 1973, co-sponsored by the National Institute of Environmental Health Sciences and the Environmental Protection Agency. The meeting confirmed that the preponderance of biological data concerning exposure to asbestos focused on the inhalation and not the ingestion route of exposure. A consensus of that international conference was that research was needed on health effects associated with asbestos ingestion. A Subcommittee of the DHEW Committee to Coordinate Toxicology and Related Programs (CCTRP) subsequently reviewed the existing data, recommended that additional research be undertaken, and prepared a draft research protocol that it felt would be responsive to the scientific needs. This protocol was widely distributed for comments both within and without the Government. Based on the comments received, a final protocol was developed and submitted as part of its final report. In response to the Subcommittee's report, Congress appropriated specific funds directing the National Institute of Environmental Health Sciences to research the effects

of oral asbestos ingestion. The NIEHS is conducting this research primarily through its research contracts program. The Environmental Protection Agency also contributed funds for these studies. The design of these studies are in concert with the recommendations of the CCTRP Subcommittee. The basic design of the studies provides for an evaluation of chrysotile, a serpentine asbestos; and amosite and crocidolite, fibers representative of amphibole asbestos; plus a non-fibrous tremolite which does contain low levels of asbestiform fibers.

The studies call for asbestos to be fed continuously in the diet over the entire lifespan of the test animal. Each form of asbestos is contained at a 1% level in a pelleted rodent diet of constant ingredient formulation (NIH Feed 31). The proposal to incorporate the asbestos within a pelleted diet form was approved only after studies indicated that the pelleting process did not alter the physical integrity of the fiber. The utilization of an asbestos diet in a pelleted form has obvious advantages: it minimizes fiber aerosols which would occur with greater ease in a non-pelleted form; it minimizes variations of asbestos concentration in the diet due to segregation of fibers that would occur during shipping, handling, and feeding. Incorporating asbestos into food rather than water eliminates settling and subsequent uneven distribution.

All materials are being fed to the F-344 strain of rat; whereas two forms of asbestos, chrysotile and amosite, are also to be tested in hamsters. Golden Syrian hamsters represent a second test species and are being fed a serpentine or amphibole form of asbestos. All

studies encompass the lifespan of the animal, which is defined as the age at which the animal begins eating solid food until its death. To insure asbestos ingestion at a young age, these studies are initiated by feeding the asbestos diet to a nursing mother, which is removed once the pups are weaned. These latter animals that begin eating asbestos at two weeks of age constitute the test generation.

In the basic studies, the test group size is 500, composed of equal numbers of males and females. In each of the rat and hamster studies, there is a composite total of 1,000 animals that receive diet which does not contain asbestos and serve as controls. The experimental group size allows one to detect a statistically significant increase in gastrointestinal tumors in the treated groups at a 2% increase above the control population.

In another rat experiment, two subset of 200 animals each are to receive asbestos from the first to the 28th day of life by gastric intubation. The rat pups received 2.35 mg of an aqueous asbestos suspension daily. At weaning, the rats are placed on the appropriate asbestos diet for the remainder of their lifespan. One subset of 200 animals is to receive chrysotile while another subset is to receive amosite. The objective of these experiments is to see if a possibility exists that neonates may be a special risk population.

There is also scientific interest in determining if asbestos in the diet alters the expression of intestinal neoplasms induced by a known chemical

carcinogen. Studies of this type are performed in rats that are fed either chrysotile or amosite. A similar study will be conducted in hamsters receiving the chrysotile diet. There are 350 animals in each of these three groups. The chemical carcinogen to be utilized was selected after a series of dose-ranging experiments of one-year's duration was performed in each species. In these dose ranging studies, both dimethylhydrazine and methylazoxymethanol were evaluated. The results indicated that dimethylhydrazine was the chemical carcinogen of choice due to lower toxicity and greater specificity of intestinal tumor response. The dose selected is one that will produce approximately a 10% incidence of intestinal tumors. That dose for hamsters is 4 mg/Kg, whereas for rats it was 7.5 mg/Kg and 15 mg/Kg in male and female rats respectively. The dimethylhydrazine is administered by gavage once every fourteen days until five doses have been administered. The initial dose was administered at six weeks of age. Tables 1 and 2 summarize the design of the animal study.

The animal testing phase of the experiments commenced in late 1975. Since the natural lifespan of the F-344 rat is 26-30 months and 1, 23 months for the hamster, definitive interpretation of these studies is several years away.

All animals receive a thorough pathologic evaluation at time of autopsy. In conformance with the NCI Carcinogen Bioassay protocol, some thirty tissues in addition to any gross lesions will be examined under light microscopy.

The rat studies are being performed through a contract with Hazleton Research Laboratories, Vienna, Virginia; whereas the hamster experiments are being performed by the Illinois Institute of Technology Research Institute, Chicago, Illinois.

As a biologist, I wish to emphatically state that the most difficult decision in the design of these studies was determining the types and specific forms of asbestos that were to be fed. The literature clearly indicated that some previous studies were flawed due to unwitting physical violence imposed upon the asbestos during its preparation. In some cases, there was concern about contamination by organic chemicals. In medical research circles, the issue still rages with respect to the size of fiber that may be associated with observed neoplastic response. It is necessary to relate size that produces optimal biological response to the distribution of fiber sizes to which there is general human population exposure. The common fiber found in municipal water supplies represents one of serpentine origin. From a numerical standpoint, the preponderance of these fibers are of the low micron and submicron lengths. To accommodate to these circumstances, it was decided that there would be two chrysotile asbestos materials used in the rat and hamster studies. These are referred to as the NIEHS short-range chrysotile and the NIEHS intermediate-range chrysotile.

NIEHS short-range chrysotile was mined from the New Idria deposits in California. This chrysotile is of very small fiber length and diameter. It is a single lot produced by Union Carbide and is referenced by them as COF-25. The NIEHS intermediate-range chrysotile originated from the Johns-Manville Jeffrey Mine in Canada. This material has general analogies to their Plastobest 20.

One method of comparing these two chrysotile samples is by comparing surface area determinations. Table 3 presents the results of such tests; the UICC chrysotile surface area values are listed for comparison. The UICC samples have been the asbestos source for the majority of biological studies over the past several years. As can be seen from the table, the NIEHS intermediate-range chrysotile compares quite favorably with the UICC Canadian chrysotile. The two-fold increase in surface area of the NIEHS short-range chrysotile compared to its intermediate-range counterpart reflect the much smaller fiber size found in this sample.

The amphibole samples, amosite and crocidolite, were prepared by the Ontario Research Foundation under the direction of the U.S. Bureau of Mines' College Park laboratory. This asbestos, purchased commercially, has been processed by air jet milling to better standardize the range of fiber size contained in the material.

The tremolite sample was mined and milled to -325 mesh by the R. T. Vanderbilt Company, Balmat, New York. It was subsequently

blended by the U.S. Bureau of Mines personnel to insure homogeneity of the sample.

All test materials are being extensively characterized as to chemical and fiber size characteristics. The characterization data include X-ray diffraction parameters, chemical composition, DTA, TGA, optical constants, density, and surface area. These studies are being performed by the U.S. Bureau of Mines. Exhaustive electron microscopic characterization of each material as to fiber length, fiber diameter, surface area, distribution of fiber size, and selective pore volume measurements are being performed by the Fine Particles Laboratory of the Illinois Institute of Technology Research Institute, Chicago, Illinois.

The characterization studies on tremolite and the short-range and intermediate-range chrysotile are nearly complete. The characterization of amosite and crocidolite are scheduled for completion by the end of the year.

Two recent ingestion studies that have been reported within the past year yielded variable results. In a British study, a group of 32 Wistar rats were fed 100 mg per day of UICC Canadian chrysotile prepared in milk powder on a five-day a week schedule for a total of 100 days of ingestion. There were 16 control animals which were fed only the malted milk. The animals were then allowed to live out their lifetime, which was a mean survival of 619 days for those animals on chrysotile

versus 641 days for the controls. One gastric leiomyosarcoma was observed in the chrysotile group. No tumors of this type were found to occur in the controls (Wagner et al., 1977).

In a study reported in the East German literature, a statistically significant ($p < 0.01$) increased incidence of malignant tumors occurred in rats that received asbestos filter material in the diet (Gibel et al., 1976). The exact composition of the asbestos filter material was not given in this paper. In this study, 25 male and 25 female Wistar rats were given 50 mg/Kg body weight per day of asbestos filter material which contained approximately 52% chrysotile asbestos. This asbestos containing filter material had been previously powdered and added as a water suspension to the diet. In the group of animals which received the asbestos filter material, the average survival time was 441 days. Untreated controls had an average survival time of 702 days. Of the 42 treated rats available for pathologic evaluation, 12 malignant tumors were found. This is to be compared to 7 tumors (two liver cell carcinomas and five mammary fibroadenomas) observed in 49 control animals. The tumor types observed in the animals fed the asbestos filter material included four kidney carcinomas, one lung carcinoma, three reticulum cell sarcomas, and four liver cell carcinomas. Two mammary fibroadenomas as well as a lung adenoma, two cholangiomas, and two forestomach papillomas were also observed.

The NIEHS Oral Asbestos Studies should provide controlled data from large enough sample sizes to allow for initial formulation of basic principles as to the biological effects of exposure to ingested asbestos.

REFERENCES

- [1] IARC Monographs on the Evaluation of Carcinogenic Risk of Chemicals to Man, Asbestos, volume 14. International Agency for Research on Cancer, Lyon, France (1977).
- [2] Cunningham, H. M. and Pontefract, R. D., Asbestos fibres in beverages and drinking water, Nature (Lond.) 232, 332-333 (1971).
- [3] Cook, P. M., Glass, G. E. and Tucker, J. H., Asbestiform amphibole minerals: detection and measurement of high concentration in municipal water supplies, Science 185, 853-855 (1974).
- [4] Cunningham, H. M. and Pontefract, R. D., Asbestos fibres in beverages and drinking water, Nature (Lond.) 232, 332-333 (1971).
- [5] Cunningham, H. M. and Pontefract, R. D., Asbestos fibres in beverages and drinking water, Nature (Lond.) 232, 332-333 (1971).
- [6] Merliss, R. R., Talc and asbestos contaminant of rice, J. Amer. Med. Assoc. 216, 2144 (1971).
- [7] Wolff, A. H. and Oehme, F. W., Carcinogenic chemicals in food as an environmental health issue, J. Amer. Vet. Med. Assoc. 164, 623-629 (1974).
- [8] Wagner, J. C., Berry, G., Cooke, T. J., Hill, R. J., Pooley, F. D., and Skidmore, J. W., Animal experiments with talc, in Inhaled Particles and Vapours, IV, W. C. Walter, ed., New York, Pergamon (in press).
- [9] Gibel, W., Lohs, K., Horn, K.-H., Wildner, G. P. and Hoffmann, F., Tierexperimentelle untersuchungen uber eine kanzerogene wirkung von asbestfiltermaterial nach oraler aufnahme, Arch. Geschwulstforsch 46, 437-442 (1976).

TABLE 1: NIEHS oral asbestos study

Golden Hamster

	<u>CHRYBOTILE INTERMEDIATE</u>	<u>CHRYBOTILE SHORT RANGE</u>	<u>AMOSITE</u>
Asbestos diet	500 ^a	500	500
Asbestos diet plus dimethylhydrazine ^a	350	ND	ND
Control diet ^b	500	250	250
Control diet plus dimethylhydrazine ^a	250	ND	ND

^aNumber of animals (equal numbers of each sex)

^bControl allocations are descriptive only. Experimental response will be evaluated against total controls (1000). Subsets of control will reflect temporal differences in commencing phases of study which is expected to be aggregates of 250-350.

ND - Not done

Studies conducted by Illinois Institute of Technology Research
Institute, Chicago, Illinois.

TABLE 2: NIEHS oral asbestos study

F-344 Rat

	<u>CHRYSTILE INTERMEDIATE</u>	<u>CHRYSTILE SHORT RANGE</u>	<u>AMOSITE INTERMEDIATE</u>	<u>CROCIDOLITE</u>	<u>TREMOLITE</u>
Asbestos diet	500 ^a	500	500	500	500
Asbestos diet plus dimethylhydrazine ^a	350	ND	350	ND	ND
Prewaning asbestos gavage plus asbestos diet	200	ND	200	ND	ND
Control diet ^b	175	175	175	175	175
Control diet plus dimethylhydrazine ^a	250	ND	250	ND	ND

^aNumber of animals (equal numbers of each sex)

^bControl allocations are descriptive only. Experimental response will be evaluated against total controls (1000). Subsets of control will reflect temporal differences in commencing phases of study which is expected to be aggregates of 250-350.

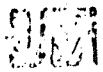
ND - Not done

Studies conducted by Hazleton Research Laboratories, Vienna, Virginia.

TABLE 3: Comparison of UICC and NIEHS chrysotile samples

<u>ASBESTOS IDENTIFICATION</u>	<u>UICC VALUE (m²/g)</u>	<u>IITRI VALUE (m²/g)</u>
UICC Rhodesian Chrysotile	21.3 $\pm$ 1.5	22.35
UICC Canadian Chrysotile	26.8 $\pm$ 0.7	27.7
NIEHS Intermediate Range Chrysotile		27.8 $\pm$ 2.7
NIEHS Short Range Chrysotile		59.0 $\pm$ 6.2

CRM-C-MAD-000267



Johns-Manville

Internal Correspondence

To: R. P. Carter
W. A. Cooper
W. B. Reitze

F. J. Solon, Jr.
S. Speil
W. C. Streib

Date: July 31, 1974

From: E. M. Fenner

Copies: File & C

Subject: MEETING - 9:00 A.M., AUGUST 6, 1974
DEFINITION OF AN ASBESTOS FIBER - OSHA STANDARD

Dr. Calender

As you are aware, there has been considerable discussion concerning the definition of an asbestos fiber as presently used by OSHA, particularly in regard to the prescribed aspect ratio of 3 to 1.

ASTM has organized Committee E-34, "Committee on Occupational Health and Safety Aspects of Materials, Physical and Biological Agents". There are a number of subcommittees and task groups within this committee. One of these task groups is concerned with "naturally occurring inorganic fibers".

This task group is presently engaged in writing for submittal to OSHA through normal ASTM channels a revised standard for occupational exposure to asbestos fibers. One of the important sections being written by this task group is concerned with the definition of asbestos fiber.

The next meeting of the Task Group on Naturally Occurring Inorganic Fibers takes place on August 14 and 14 in Canada. I would very much like to be able to submit to the group a Johns-Manville definition of an asbestos fiber.

In order to accomplish this, I am requesting that you attend a meeting to discuss the subject at 9:00 A.M. on Tuesday, August 6, in our Conference Room, 4 North.

For background information prior to the meeting, I enclose the following:

- (1) A letter to F. J. Solon, Jr., describing ASTM Committee E-34.
- (2) A definition for asbestos fiber as prepared by a subsection of the task group for affirmative or negative balloting by the group members.

CRMC-MAD-000268

R. P. Carter, et al
Page 2
July 31, 1974

(3) A series of definitions of asbestos as previously submitted by the following people:

- A. A. Hodgson, Cape Asbestos Fibres Limited
- G. Gagnon, Lake Asbestos of Quebec Limited
- M. Grimard, M.D., Department of National Health & Welfare of Canada
- R. B. Steele, Asbestos Corporation Limited
- A. A. Harvey, R. T. Vanderbilt Company

(4) A definition of an asbestos fiber as prepared by Dr. Steven Holmes of the Asbestosis Research Council.

(5) The ASTM present definition of asbestos fiber.

(6) & (6A) Two anonymous definitions of asbestos.

(7) An anonymous definition of naturally occurring inorganic fibers.

(8) A copy of the original proposal for the formation of the Task Group on Naturally Inorganic Fibers.

(9) A listing of active members of the task group and all others on the mailing list for material.

E. M. Fenner

SUPPLEMENTAL LISTING OF DEFINITIONS

19 April 1974

This listing is a supplement to Document No. 5 published as Appendix 6 of the minutes of the second meeting of the Task Group on Naturally Occurring Inorganic Fibers of ASTM Committee E-34.

1. Definitions submitted by Mr. A. A. Hodgson, Cape Asbestos Fibres Limited, 24 Jan 1974.

fibres Fibres are defined as being of a length greater than $5\mu\text{m}$ and having a length/breadth ratio of at least 3:1. There is no upper limit for the length of the fibres, but a maximum diameter of $3\mu\text{m}$ is defined. Airborne asbestos dust concentrations are expressed in fibers per milliliter of air (f/ml).

(taken from the Asbestosis Research Council's Technical Note 1, paragraph 2.1)

asbestos - acicular silicate mineral, with a structure based on silicon - oxygen tetrahedra, composed of crystals in a predominantly parallel orientation, and distinguished by its ability to split indefinitely from its macro form to individual flexible fibrils having minimum length to breadth ratio of 3 to 1 and cross sectional dimensions approaching $0.01\mu\text{m}$.

2. Definitions submitted by Mr. G. Gagnon, Lake Asbestos of Quebec Limited, 28 Jan 1974:

fibre - any material in a form such that it has a minimum ratio of length to average maximum transverse dimensions of 10 to 1.

asbestos fibre - silicate mineral, with a structure based upon silicon - oxygen tetrahedra, that fits the definition of a fibre and is composed of single crystals in predominantly parallel orientation. Common usage also designates a collectivity of asbestos fibres as asbestos fibres.

3. Definitions submitted by Dr. M. Grimard, Chief, Health Effects Division, Environmental Health Directorate, Department of National Health and Welfare of Canada,

fibre - (definition as applied to minerals): any material which by microscopy presents the following optical characteristics: a filiform or bundle of filiform bodies having a length to diameter ratio of at least 3:1

asbestos fiber - acicular silicate mineral, with a structure based upon silicon-oxygen tetrahedra, that fits the definition of a fiber, and is composed of single crystals in predominantly parallel orientation.

4. Definitions submitted by Mr. A. M. Harvey, Manager, Legal and Products Application, R. T. Vanderbilt Company, Inc., 4 Jan 1974:

mineral fiber - any form of mineral characterized by properties of flexibility and length to width ratio of at least 100, and composed of definite crystal unit cells oriented with respect to a specific axis.

asbestos - is a generic term for a number of hydrated silicate minerals that, when crushed or processed, separate into flexible fibers made up of fibrils. These minerals include chrysotile, crocidolite, amosite, anthophyllite asbestos, tremolite asbestos and actinolite asbestos.

5. Definitions submitted by Mr. R. B. Steele, Laboratory Services Engineer, Product Research and Development Department, Asbestos Corporation Limited, 5 March 1974:

Fibril - Is a polymeric form of solid whose component repeating sub-units extend along a single major axis, and which can not be subdivided along this longitudinal axis without destroying the integrity of the structure.

Fiber - Is a bundle of fibrils in parallel alignment, the composite possessing a maximum diameter of 100 microns, and a minimum aspect ratio of 20.

Asbestos - Is a generic term for a number of silicate minerals, the morphology of whose component particles fits the definition of a fiber.

Asbestos Fiber - Is a fiber belonging to one of the six types of asbestos minerals: chrysotile, crocidolite, amosite, anthophyllite asbestos, tremolite asbestos, and actinolite asbestos.

6. Definitions submitted by Mr. A. A. Harvey, Manager, Legal and Products Application, R. T. Vanderbilt Company, Inc., 30 Jan 1974; Definitions taken from pages 26, 27 174 and 175 of the 1973 ASTM Glossary: Refer to page 3.

7. Refer to Appendix 5 and 6 of the minutes of the third meeting of the Task Group on Naturally Occuring Inorganic Fibers.

ATTENDANCE

Third meeting of the Task Group on Naturally Occuring Inorganic Fibers,
Philadelphia, Pa. 18 and 19 April 1974

W. H. Ashton	- Johnson & Johnson Co.
M. Cossette	- Recording Secretary -
	Quebec Asbestos Mining Association
E. M. Fenner	- Vice-Chairman, Johns-Manville
G. J. Foy	- Department of Natural Resources of Quebec
A. H. Harvey	- R. T. Vanderbilt Co.
S. Holmes	Secretary of the Asbestosis Research Council
	T.B.A. Industrial Products Limited
H. H. Kaufman	- GAF Corporation
A. M. Kooiman	- Representative of the Editorial Subcommittee
	- Motor Vehicle Manufacturers' Association
J. F. Martonik	- MESA, Department of the Interior Washington D.C.
R. McCarthy	- International Talc
P. W. McDaniel	- Union Carbide Corporation
R. H. Mereness	- Asbestos Information Association/North America
• P. V. Pelnar, M.D.	- Institute of Occupational and Environmental Health
C. S. Thompson	- R. T. Vanderbilt Company.
A. A. Winer	- Chairman, Department of Energy, Mines and Resources of Canada

MAILING LIST

Dr. J. W. Axelson	- Johns-Manville Research and Development Center
Dr. E. Berry	- Department of Materials Chemistry
R. A. Bramley-Moore	- Chrysotile Corporation of Australia Pty. Ltd.
W. R. Cooling	- Asbestos Corporation Limited
H. A. Eschenbach	- Industrial Hygienist
	W. R. Grace & Co.
P. A. Filteau	- Quebec Asbestos Mining Association
G. Gagnon	- Assistant Mill Superintendent
	Lake Asbestos of Quebec Limited
G. W. Gibbs	- McGill University
	Department of Epidemiology and Health
Dr. M. Grimard	- Department of National Health and Welfare of Canada

MAILING LIST (suite)

A. Goodwin	- Head, Health Division
A. A. Hodgson	- Cape Asbestos Fibers Limited
Dr. R. A. Kuntze	- Ontario Research Foundation
Dr. J. Lepoutre, M.D.	- Eternit S. A.
B. Lincoln	- Turner Newall Fibre Laboratory
G. G. Morgan	- North American Asbestos Corporation
K. Morgareidge	- Food and Drug Research Laboratories, Inc.
T. D. Oulton	- Research Associate Minerals & Chemical Division
L. C. Piuze	- Lake Asbestos of Quebec Limited
M. Q. Scowcroft	- Asbestos Textile Institute
W. H. Smith	- Bell Asbestos Mines Limited
R. B. Steele	- Asbestos Corporation Limited
C. E. Stiefken	- American and Refining Co. Ltd.
E. T. Triglea	- Engelhard Chemical & Mineral Industries

R. T. VANDERBILT COMPANY, INC.

33 WINFIELD STREET
EAST NORWALK, CONNECTICUT 06855

CABLE ADDRESS
BILTVAN NEW YORK

January 2, 1973

Mr. William B. Reitze, Manager
Accident Prevention & Health Administration
Juno-Manville Corporation
660 Syracuse Circle
Denver, Colorado 80110

Dear Mr. Reitze:

The enclosed copy of a report describing a recent visit with
Dr. William E. Smith, of Fairleigh Dickinson University, may be of interest
to you.

Very truly yours,

R. T. VANDERBILT COMPANY, INC.

Allan M. Harvey

Allan M. Harvey, Manager
Patent and Legal Liaison Department

AMH:cr

Enclosure



Johns-Manville

Internal Correspondence

To: E. M. Fenner
R. P. Carter

Date: August 28, 1974

From: G. L. Swallow

Copies: E. J. Solon, Jr.
W. B. Reitze
File & Chron

Subject: CONVERSATION WITH HOWARD J. SCHULTE/OSHA, AND RAY McCLURE/OSHA
REFERENCE: JOHN STENDER'S LETTER OF AUGUST 6, 1974, TO
MR. H. B. VANDERBILT, R.T. VANDERBILT CO., INC.

In response to your request, I called Howard Schulte and discussed with him the subject letter. He was obviously entirely familiar with it.

Mr. Schulte stated that the whole interpretation of the letter hinges upon the definition of "asbestiform" and "non-asbestiform".

In response to my question as to what was the current definition of asbestiform, or differentiation between asbestiform and non-asbestiform, he stated that the definition is the same as previously used in conjunction with the asbestos regulations, specifically that the aspect ratio be 3:1 or greater, and that the length be greater than 5 microns. He amplified his definition by saying that if a talc sample were examined under a microscope and more than 5 artifacts/cc were counted, which fit this definition, it would be termed a violation of the OSHA regulations. When I pressed him concerning the difference between artifacts and tremolite, he stated that, "We cannot take tremolite from the standard at this time." He further stated that OSHA technicians have never seen artifacts which fit the above definition which they consider to be non-tremolitic.

He stated that NIOSH is currently studying the possibility that there do exist non-tremolitic "slivers" which should be differentiated from the tremolitic fibers and which, because they are (perhaps) not a health hazard, should not be counted when evaluating a talc sample. However, the results of this study are one to two years off.

In answer to my query, he stated that the Vanderbilt Company argued the above point, namely that such "slivers" do exist and that it is inaccurate and unfair to include them in any fiber counts associated with talc sampling. He went on to say that despite Vanderbilt's arguments, OSHA was not going along with this concept, unless and until the NIOSH study mentioned above confirmed it.

As our conversation drew to a close, Mr. Schulte suggested that since I had asked so many detailed and technical questions, it would be well for me to talk to Ray McClure. He told me that he would have Ray call me later today.

CRMC-MAD-000275

E. M. Fenner/R. P. Carter
August 28, 1974
Page Two

Later this morning, Ray McClure called and referred to my conversation with Howard Schulte.

He started by explaining that the Vanderbilt mining operations are under the jurisdiction of MESA, not OSHA. Their concern with the OSHA regulations is because of their customers who have read the asbestos regulations and are worried about being cited in their plant operations because of possible tremolitic content in the talc.

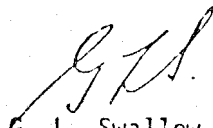
Mr. McClure said that John Stender's letter of August 6, 1974, was an attempt to give some relief for this situation, but doubted that it did so very effectively.

He stated that he was presently urging certain modifications to the standard as presently written. His recommendations are to NIOSH, and must be approved by NIOSH before they can be seriously considered or promulgated. In answer to my question as to what specifically he was recommending, he cautioned me to realize that these were wholly tentative and stated that they were:

1. Revise the aspect ratio in the fiber definition (as associated with talc) from 3:1 to 5:1. He noted that such a recommendation would be contingent upon NIOSH opinion regarding the health aspect.
2. Do not count any fibers whose diameter is greater than 5 microns.
3. Require that the microscopist attempt to make positive identification of fibers as being asbestos particularly by means of observing the fiber end configuration.

He stated that the Salt Lake City laboratory consists chiefly of OSHA people, now, and that the microscopists already attempt to differentiate between true tremolitic fibers and other non-fibrous artifacts which would be classified as fibers if judged only by aspect ratio and length. (Please note the discrepancy between this note and Howard Schulte's)

Mr. McClure stated that if the above changes are successfully promulgated, the standard will probably require sampling by the "asbestos technique" and by impinger. Whether or not a given station is over TLV will be judged by whichever criterion is stricter. OSHA is also considering requiring high volume air samples to permit chemical or mineralogical analysis of the airborne dust.


G. L. Swallow
GLS/jmb

CRMC-MAD-000276

Johns-Manville

Internal Correspondence

R. S. Decker - R&D

Date October 23, 1974

V. E. Welkoff - R&D

Distribution on Reverse Side

TEM AND SELECTED AREA DIFFRACTION PATTERNS OF ASBESTOS MINERALS IN FOUR
TALC SAMPLES PRODUCED BY R. T. VANDERBILT COMPANY

1. At your request, I was able to contract time on the Philips 200 electron microscope at Denver Research Institute to confirm by selected area diffraction patterns, the presence of chrysotile, anthophyllite and tremolite in all the R. T. Vanderbilt talcs designated Hydral 100, Hydral 400, Asbestine 3X, and Asbestine 325X (please refer to my letter of October 9, 1974, which is based basically on FEA optical methods and the use of our RCA electron microscopes to confirm chrysotile). It was felt that selected area diffraction patterns of the asbestos minerals using the Philips 200 would lend positive identification - a type of analysis which cannot be done on our RCA EMU-3B model.
2. Table No. 1 not only identifies samples, but also identifies all TEM prints and selected area diffraction patterns of the 33 prints attached to this letter. The TEM plates are always on file. The microscope constant ($L \lambda$) was derived by averaging 21 microscope constant values based on lines of Au and Pd. The microscope constant is:

$$L \lambda = 4.451 \text{ } \overset{\circ}{\text{A}} \text{ cm} \pm 0.003$$

To calculate d-spacing in Angstrom units, the following formula was used:

$$\frac{L \lambda \text{ (} \overset{\circ}{\text{A}} \text{ cm)}}{\text{spot pair radius (cm)}} = \text{d-spacing (} \overset{\circ}{\text{A}} \text{)}$$

3. Chrysotile, anthophyllite, and tremolite were all found in each of the four R. T. Vanderbilt talc samples. Particular data for each sample are found in Table No. 1 and appropriate attached electron diffraction patterns.

V. E. Welkoff

V. E. Welkoff

jc

Attachments

Distribution:

R. P. Carter* - 4N
E. E. Fenner - 4N
Paul Kotin, M.D. - 4N
W. B. Reitze - 4N
F. J. Solon, Jr. - 4N
G. L. Swallow - 4N
A. C. F. Finkolner, III - 5W
J. A. McKinney - 5W
H. R. Keeffe* - 2W
P. A. Martinson - 2W
C. J. Salewski - 2W
W. L. VanDerbeek - 2S
R. G. Riene - 2S

F. L. Pundsack
J. P. Leineweber*
W. C. Streib
S. Speil*
R. S. Lamar*
V. E. Wolkodoff*

*Prints attached only to those names followed by asterisk.

TABLE 1

TEM Tabulation of Micrographs and Selected Area Diffraction
Patterns of Four Talc Samples From R. T. Vanderbilt Co.

No.	Micro. No.	Vanderbilt Designation	TEM Plate No., Magnification	Selected Area Diffraction Pattern, 35X	Remarks
1	RC 76255-1	Nytal 200	2301A, 11,000X	-	-
2	RC 76255-1	Nytal 200	2317A, 16,000X	-	-
3	RC 76255-1	Nytal 200	2305A, 22,000X	-	Chrysotile fiber
4	RC 76255-1	Nytal 200	-	2305B	Pattern is of widest fiber in 2305A, Chrysotile
5	RC 76255-1	Nytal 200	2306A, 22,000X	-	Anthophyllite fiber
6	RC 76255-1	Nytal 200	-	2306B	Anthophyllite fiber in 2306A
7	RC 76255-1	Nytal 2-0	2307A, 22,000X	-	Tremolite fiber
8	RC 76255-1	Nytal 200	-	2307B	Tremolite fiber in 2307A
9	RC 76255-2	Nytal 400	2302D, 11,000X	-	-
10	RC 76255-2	Nytal 400	2318C, 16,000X	-	-
11	RC 76255-2	Nytal 400	2308A, 22,000X	-	Chrysotile fiber
12	RC 76255-2	Nytal 400	-	2308B	Pattern of Chrysotile above
13	RC 76255-2	Nytal 400	2309A, 22,000X	-	Anthophyllite fiber
14	RC 76255-2	Nytal 400	-	2309B	Pattern of Anthophyllite above
15	RC 76255-2	Nytal 400	2310A, 22,000X	-	Tremolite fiber
16	RC 76255-2	Nytal 400	-	2310B	Pattern of Tremolite above
17	RC 76255-3	Asbestine 3X	2303D, 11,000X	-	-
18	RC 76255-3	Asbestine 3X	2319D, 16,000X	-	-
19	RC 76255-3	Asbestine 3X	2311A, 22,000X	-	Chrysotile fiber on bottom
20	RC 76255-3	Asbestine 3X	-	2311B	Pattern of Chrysotile above
21	RC 76255-3	Asbestine 3X	2312A, 22,000X	-	Anthophyllite fiber
22	RC 76255-3	Asbestine 3X	-	2312B	Pattern of Anthophyllite above
23	RC 76255-3	Asbestine 3X	2313A, 22,000X	-	Tremolite fiber
24	RC 76255-3	Asbestine 3X	-	2313B	Pattern of Tremolite above
25	RC 76255-4	Asbestine 325	2304A, 11,000X	-	-
26	RC 76255-4	Asbestine 325	2322A, 16,000X	-	Fiber is composed Chrysotile and Amphibole

Table 1 continued

No.	No.	Vanderbilt Designation	TEM Plate No., Magnification	Selected Area Diffraction Pattern, 35X	Remarks
27	10	76255-4 Asbestine 325	-	2322B	Chrysotile pattern superimposed on Amphibole pattern
28	10	76255-4 Asbestine 325	2314A, 22,000X	-	Chrysotile fiber
29	10	76255-4 Asbestine 325	-	2314B	Pattern of Chrysotile above
30	10	76255-4 Asbestine 325	2315A, 22,000X	-	Longest fiber is Anthophyllite
31	10	76255-4 Asbestine 325	-	2315B	Pattern of Anthophyllite above
32	10	76255-4 Asbestine 325	2316A, 22,000X	-	largest fiber is Tremolite
33	10	76255-4 Asbestine 325	-	2316B	Pattern of Tremolite above

Johns-Manville

Internal Correspondence

To: R. P. Carter
W. A. Cooper
W. B. Reitze

F. J. Solon, Jr.
S. Speil
W. C. Streib

Date: July 31, 1974

From: E. M. Fenner

Copies: File & C

Subject: MEETING - 9:00 A.M., AUGUST 6, 1974
DEFINITION OF AN ASBESTOS FIBER - OSHA STANDARD

As you are aware, there has been considerable discussion concerning the definition of an asbestos fiber as presently used by OSHA, particularly in regard to the prescribed aspect ratio of 3 to 1.

ASTM has organized Committee E-34, "Committee on Occupational Health and Safety Aspects of Materials, Physical and Biological Agents". There are a number of subcommittees and task groups within this committee. One of these task groups is concerned with "naturally occurring inorganic fibers".

This task group is presently engaged in writing for submittal to OSHA through normal ASTM channels a revised standard for occupational exposure to asbestos fibers. One of the important sections being written by this task group is concerned with the definition of asbestos fiber.

The next meeting of the Task Group on Naturally Occurring Inorganic Fibers takes place on August 14 and 14 in Canada. I would very much like to be able to submit to the group a Johns-Manville definition of an asbestos fiber.

In order to accomplish this, I am requesting that you attend a meeting to discuss the subject at 9:00 A.M. on Tuesday, August 6, in our Conference Room, 4 North.

For background information prior to the meeting, I enclose the following:

- (1) A letter to F. J. Solon, Jr., describing ASTM Committee E-34.
- (2) A definition for asbestos fiber as prepared by a subsection of the task group for affirmative or negative balloting by the group members.

CRMC-MAD-000281

R. P. Carter, et al
Page 2
July 31, 1974

- (3) A series of definitions of asbestos as previously submitted by the following people:

A. A. Hodgson, Cape Asbestos Fibres Limited
G. Gagnon, Lake Asbestos of Quebec Limited
M. Grimard, M.D., Department of National Health
& Welfare of Canada
R. B. Steele, Asbestos Corporation Limited
A. A. Harvey, R. T. Vanderbilt Company

- (4) A definition of an asbestos fiber as prepared by Dr. Steven Holmes of the Asbestosis Research Council.
- (5) The ASTM present definition of asbestos fiber.
- (6) & (6A) Two anonymous definitions of asbestos.
- (7) An anonymous definition of naturally occurring inorganic fibers.
- (8) A copy of the original proposal for the formation of the Task Group on Naturally Inorganic Fibers.
- (9) A listing of active members of the task group and all others on the mailing list for material.

E. M. Fenner

SUPPLEMENTAL LISTING OF DEFINITIONS

19 April 1974

This listing is a supplement to Document No. 5 published as Appendix 6 of the minutes of the second meeting of the Task Group on Naturally Occurring Inorganic Fibers of ASTM Committee E-34.

1. Definitions submitted by Mr. A. A. Hodgson, Cape Asbestos Fibres Limited, 24 Jan 1974.

fibres Fibres are defined as being of a length greater than $5\mu\text{m}$ and having a length/breath ratio of at least 3:1. There is no upper limit for the length of the fibres, but a maximum diameter of $3\mu\text{m}$ is defined. Airborne asbestos dust concentrations are expressed in fibers per milliliter of air (f/ml).

(taken from the Asbestosis Research Council's Technical Note 1, paragraph 2.1)

asbestos - acicular silicate mineral, with a structure based on silicon - oxygen tetrahedra, composed of crystals in a predominantly parallel orientation, and distinguished by its ability to split indefinitely from its macro form to individual flexible fibrils having minimum length to breath ratio of 3 to 1 and cross sectional dimensions approaching $0.01\mu\text{m}$.

2. Definitions submitted by Mr. G. Gagnon, Lake Asbestos of Quebec Limited, 28 Jan 1974:

fibre - any material in a form such that it has a minimum ratio of length to average maximum transverse dimensions of 10 to 1.

asbestos fibre - silicate mineral, with a structure based upon silicon - oxygen tetrahedra, that fits the definition of a fibre and is composed of single crystals in predominantly parallel orientation. Common usage also designates a collectivity of asbestos fibres as asbestos fibres.

3. Definitions submitted by Dr. M. Grimard, Chief, Health Effects Division, Environmental Health Directorate, Department of National Health and Welfare of Canada,

fibre - (definition as applied to minerals): any material which by microscopy presents the following optical characteristics: a filiform or bundle of filiform bodies having a length to diameter ratio of at least 3:1

asbestos fiber - acicular silicate mineral, with a structure based upon silicon-oxygen tetrahedra, that fits the definition of a fiber, and is composed of single crystals in predominantly parallel orientation.

4. Definitions submitted by Mr. A. M. Harvey, Manager, Legal and Products Application, R. T. Vanderbilt Company, Inc., 4 Jan 1974:

mineral fiber - any form of mineral characterized by properties of flexibility and length to width ratio of at least 100, and composed of definite crystal unit cells oriented with respect to a specific axis.

asbestos - is a generic term for a number of hydrated silicate minerals that, when crushed or processed, separate into flexible fibers made up of fibrils. These minerals include chrysotile, crocidolite, amosite, anthophyllite asbestos, tremolite asbestos and actinolite asbestos.

5. Definitions submitted by Mr. R. B. Steele, Laboratory Services Engineer, Product Research and Development Department, Asbestos Corporation Limited, 5 March 1974:

Fibril - Is a polymeric form of solid whose component repeating sub-units extend along a single major axis, and which can not be subdivided along this longitudinal axis without destroying the integrity of the structure.

Fiber - Is a bundle of fibrils in parallel alignment, the composite possessing a maximum diameter of 100 microns, and a minimum aspect ratio of 20.

Asbestos - Is a generic term for a number of silicate minerals, the morphology of whose component particles fits the definition of a fiber.

Asbestos Fiber - Is a fiber belonging to one of the six types of asbestos minerals: chrysotile, crocidolite, amosite, anthophyllite asbestos, tremolite asbestos, and actinolite asbestos.

6. Definitions submitted by Mr. A. A. Harvey, Manager, Legal and Products Application, R. T. Vanderbilt Company, Inc., 30 Jan 1974; Definitions taken from pages 26, 27 174 and 175 of the 1973 ASTM Glossary: Refer to page 3.

7. Refer to Appendix 5 and 6 of the minutes of the third meeting of the Task Group on Naturally Occurring Inorganic Fibers.

cc: APC



ASBESTOS INFORMATION ASSOCIATION

1745 Jefferson Davis Highway, Crystal Square 4, Suite 509
Arlington, Virginia 22202 • (703) 979-1150

22 November 1977

Memorandum For: EXECUTIVE COMMITTEE

Subject: Forwarding of Executive Committee Minutes

Please find enclosed minutes of the Executive Committee meeting, Tuesday, November 15, 1977.

R. H. Mereness
Executive Director

RHM:v

Enclosure

CRMC-MAD-000285



ASBESTOS INFORMATION ASSOCIATION

1745 Jefferson Davis Highway, Crystal Square 4, Suite 509
Arlington, Virginia 22202 • (703) 979-1150

EXECUTIVE COMMITTEE MEETING

Tuesday, November 15, 1977

Association Office

Arlington, Virginia

The meeting was called to order at 9:25 AM in the Association office, Arlington, Virginia. Present were:

Thomas A. Dougherty

CertainTeed Corp., AIA/NA
President

John H. Marsh

Raybestos-Manhattan, Inc.

Dimitry Poutiatine

Johns-Manville Corp.

Harrison B. Rhodes, Ph.D.

Union Carbide Corp.

Edward R. Zacharias

Molded Materials Co.

Others:

R. H. Mereness

AIA/NA Executive Director

B. J. Pigg

AIA/NA Administrative Assistant

John Autry

Johns-Manville Corp.

Earl Parker

Johns-Manville Corp.

Minutes

On motion, minutes of previous meeting, October 11, 1977, were approved except for following correction: The word "friable" inserted between "all" and "materials," second sentence, paragraph 2, page 3.

The Executive Director said follow-up action from last meeting which required letters to GAF Corporation and Crown Zellerbach concerning membership and an irresponsible advertisement, respectively, had been done. In response to the Committee's agreement of October 11 that Dr. Hilton Lewinsohn, Medical Director, Raybestos-Manhattan, Inc., would be "the most appropriate correspondent" with Douglas A. Fraser, President, International Union, UAW, regarding allegations of an asbestos-health nature contained in his July letter to the Secretary of Labor, Mr. Marsh explained that he did not deem it appropriate for Dr. Lewinsohn to pursue this matter since his company is not directly involved with the UAW.

CRMC-MAD-000286

Mr. Dougherty expressed appreciation to Messrs. Poutiatine and Marsh for their assistance in obtaining the services of Messrs. Carter (J-M), Fenner (J-M), Reis (J-M), and Weaver (R/M) to serve in various committee assignments as was agreed on at last meeting.

Introduction

Mr. Dougherty explained the circumstances that precluded the attendance of committee members Messrs. Rainey and Schwarz at the meeting. In addition, Mr. Dougherty said Mr. Rainey had advised that press of business made it necessary for him to resign from the Executive Committee. Mr. Dougherty advised that Mr. Gabrielson had been invited to attend the meeting but was informed that he could not attend.

Financial Affairs

The financial statement for the ten months period ended October 31, 1977, was reviewed by the Executive Director. Total assets of \$154,034 and liabilities of \$107,692 result in a net worth balance of \$46,342 on an accrual basis. Net worth of preceding month's statement was \$30,203. Variances between budget and expenditures were explained.

Payments to date on EEH study total \$166,677.34. It was reported at the October 11 meeting that William T. Malloy, executive vice president, EEH, had confirmed that the total cost for completion of the study as currently defined is \$170,000.

A total of \$22,950.41 has been expended to date on Dr. Enterline's research of medical literature and review of work by Dr. Ian Higgins, University of Michigan. Dr. Enterline expects to finish the asbestosis phase of his project by end year. It is not expected that this work will result in significant expenditures. As a related matter, "physician" review of the completed work has been completed by Dr. Weill and is now in progress by Dr. Lewinsohn. It was agreed that Special Counsel should also request similar review by Dr. Rotin. The Executive Director was requested to so advise Special Counsel. A general discussion followed concerning the legal-medical research project and the anticipated state of the medical art paper being developed by Special Counsel.

On motion, the financial statement was accepted as presented.

Executive Director's Report

OSHA -- Award of a contract by OSHA to RTI for purpose of consolidating the CONSAD and RTI technological and economic impact assessment studies of the manufacturing and construction industries, respectively, appears imminent. The delay has been due to negotiations on cost of contract. A spokesman for the consulting firm, JRB Associates, coordinating economic impact assessments for OSHA, has advised that a completion date of April 15, 1978 is now forecast for this work. The principal task in consolidation of the two studies relates to resolving different economic methodology used in development. There is no indication that OSHA is proceeding with any priority in preparation of a proposed standard for the construction industry which cannot be published prior to issuance of an economic impact assessment. It is, therefore, unlikely that a public hearing on the asbestos standard(s) will be scheduled prior to mid to late summer 1978.

Issuance of a proposed labeling standard by OSHA for hazardous substances may be expected by end year, according to Assistant Secretary of Labor (OSHA), Dr. Bingham, in remarks to meeting of National Safety Congress on October 20. In this connection, Edmund Fenner, J-M Corp., and Chairman AIA/NA Technical Committee designate, will represent his company and the Association at a Labeling and Warning Systems Symposium sponsored by American Conference of Governmental Industrial Hygienists in Washington, D. C., on November 21-22.

EPA -- An EPA representative has advised that final amendments extending prohibition of spraying provisions of national emissions standard to all friable materials sprayed on buildings, structures, etc., containing more than 1% asbestos by weight, may be expected to be published in the Federal Register in January 1978.

On November 10, EPA published its intent in Federal Register to determine extent of asbestos emissions that may exist from use of crushed stone produced from serpentine-containing rock quarries. The study was precipitated by early 1977 reports by EPA and Mt. Sinai School of Medicine that ambient air concentrations of chrysotile fibers were as high as 17 million per cubic meter in areas adjacent to a Montgomery County (Rockville), Maryland, quarry.

MESA -- President Carter signed bill November 9 which transfers Mining Enforcement and Safety Administration from Interior to Labor Department, effective March 1978.

CRMC-MAD-000288

NIOSH -- The National Institute for Occupational Safety and Health awarded over 30 research contracts totaling about \$6 million at close of fiscal year ended September 30. Of interest is a three-year contract for an inhalation study of short asbestos fibers using rats and monkeys awarded to International Research and Development Corp. in the amount of \$395,000.

CPSC -- A final ban on asbestos-containing patching compounds, as recommended to the Commission by the staff, would encompass patching compounds which a consumer can purchase. In addition to products sold to the consumer, the ban applies to patching compounds (containing respirable free form asbestos) which are used in residences, schools, hospitals, public buildings or other areas where consumers have access. The Commission will be briefed by staff in public meeting November 17.

The use of patching compounds in consumer environments determines their status as consumer products regardless of who applies the compounds. This definition was taken from the Anaconda decision, although CPSC admits the courts have not yet reached a definitive decision on the coverage of the term "consumer product."

As proposed, the effective date of the ban would be 30 days from publication of the final rule. In comments, the staff noted that the continued marketing of the merchandise from inventory should not be permitted as the consumer would be exposed to the unreasonable risk of cancer which the Commission is seeking to reduce or eliminate.

By way of recognizing the impossibility of a zero exposure level, the ban would allow a trace amount of asbestos in a sample because of the ever present background contamination. This limit is 1 fiber/1000 particles in a sample. This would limit the fiber content to less than 0.25% by weight. Dr. William Nicholson, Mt. Sinai School of Medicine and CPSC consultant, advised on this standard. Emberizing ash would be banned immediately on publication of the ban. (Note: At the Commission briefing November 17, considerable discussion centered on background contamination and definitions, e.g., fiber and particulates. Since data now available to CPSC staff is incomplete, the Commission indicated it is leaning toward "intentional addition of asbestos" rather than a specific level of fibers for definition of ban on asbestos-containing spackling compounds in order to proceed as soon as possible. The Commission is expected to extend publication of the ban from November 29 to December 12.)

State Developments -- A comprehensive digest of state laws and regulations affecting asbestos is nearing completion by Mark Grayson of staff and will be distributed to members for information and guidance in the near future. States which have been recently or are currently active in this area include: New Jersey, Iowa, California, Illinois, Washington and Connecticut. Specifics have been provided to Dr. Rhodes, Chairman of the Standards Advisory Committee.

R. T. Vanderbilt Co. - OSHA Congressional Letter Exchange -- The recent exchange of correspondence between R. T. Vanderbilt Co. and OSHA and members of Congress which primarily deals with the controversy over whether tremolitic talc contains asbestos was reviewed. It was agreed that the subject should be followed, but that no response to the "Asbestos Fact Sheet" issued by OSHA to members of Congress in August would be made by the Association.

Meetings of Interest -- Attention was invited to upcoming meetings of interest to the Association. Specific reference was made to the Conference on Occupational Exposure to Fibrous and Particulate Dust and their Extension into the Environment scheduled for December 4-7, Mayflower Hotel, Washington, D. C., jointly sponsored by the Society for Occupational and Environmental Health and NIOSH. The program was discussed. It was noted that announced speakers are in the main associated with distinct bias against the asbestos industry. Attendance of AIA/NA members was encouraged.

Directors Meeting, December 14 -- It was reported that Dr. Eula Bingham, Assistant Secretary of Labor (OSHA), had accepted an invitation to be luncheon speaker at the Directors Meeting, December 14, Stouffer's National Center Hotel, Arlington, VA.

Technical Committee Report and AIA/NA Asbestos Dust Sampling and Exchange Program

As a follow-on to committee assignments agreed on at last Executive Committee meeting, October 11, Dr. Rhodes said he had recently visited with Mr. Fenner, Chairman designate, Technical Committee, and discussed in general terms a program of work for the year. Thorough review of the ESH draft document and development of the work practices approach for an asbestos construction standard alternate were identified as priority projects. The Technical Committee will meet November 16 in the Association office. A refinement of membership composition is in order and will be accomplished.

Dr. Rhodes reported on responses to the AIA/NA round robin dust sampling and exchange program. Seventeen recipients of the protocol have agreed to participate by collecting and counting and 8 have agreed to count. Dr. Rhodes spoke of a meeting with NIOSH representatives on October 12 in Cincinnati regarding participation. (Note: In letter dated November 11 NIOSH has declined to participate in the program.) A meeting with Mr. Phillip Brown, OSHA, is scheduled to further explore the possibility of OSHA's participation. The Asbestos Sampling and Exchange Program Committee will meet in the Association office, November 17.

Government Activities Committee

Dr. Rhodes reviewed current status of the recent generic cancer regulation proposed by OSHA. It was emphasized that formidable opposition to the proposal is being developed by the Manufacturing Chemists Association and Synthetic Organic Chemical Manufacturers Association. The Executive Director referred to an Inter-Industry Task Force comprised of about 30 large firms which is developing a "rational cancer policy" for submission to OSHA. It was stated that Dr. Paul Rotin, J-M Corporation, is a contributor to the task force project. The due date for comments on the proposal will be extended from December 8 to January 9, 1978.

Dr. Rhodes said it was his understanding that two law suits, one in New York and one in Texas, were being filed by industry on the generic cancer proposal. The suits allege denial of due process and that the proposal was improperly issued since no economic impact assessment had been made. A third suit challenging OSHA's statutory authority was also mentioned as being a possibility. As to possible actions by AIA/NA, Dr. Rhodes suggested that: close touch be maintained with other industry associations such as MCA and SOCMA; efforts should be directed to only those areas that might specifically affect asbestos; Dr. Weill might consider his medical statement submitted with the Association's response to OSHA on the proposed revision to the manufacturing standard; consideration might be given to development of an "estimate of risk" for occupational exposure to asbestos. Alternatively, the Association might endorse a response such as being prepared by SOCMA, etc.; a token or comprehensive asbestos industry response by AIA/NA could be prepared. Individual member companies may wish to comment. No specific decision was made as to the Association's possible actions with regard to OSHA's generic cancer proposal. The matter will be further considered at the next regular meeting.

Draft 1978 Budget

Mr. Dougherty referred to a first draft of an Association budget for fiscal (calendar) year 1978 as prepared by staff. The various line items were spoken to briefly. Committee members were requested to be prepared to give detailed consideration of the 1978 budget at next regular meeting of the Committee prior to budget presentation to Directors, December 14.

Captive Insurance Program

The Executive Director said Armrisk, Inc. had received completed questionnaires from nine of the 15 participating companies. Effort will be made to obtain the remaining questionnaires as soon as possible in order to complete the study.

Medical Review/International Activities

Mr. Marsh made reference to three new medical papers by the doctors McDonald which are yet to be published. He said one paper states that "almost all cases of mesothelioma are traceable to crocidolite and amosite."

Mr. Marsh stated that the Asbestos International Association is currently working with the Commission of the European Communities as that organization prepares a directive on asbestos. In addition, AIA is active with the British Parliamentary Commission on Asbestos in an effort to achieve mutually acceptable regulations. Mr. Marsh stated a report on the October Executive Committee meeting of the international association would be circulated in the near future.

Resolution on Association Representations in Response to Government Initiatives

Mr. Dougherty said that written comments on this item have been received from Hollingsworth & Vose Co., Union Carbide Corp., and Johns-Manville Corp. Copies were provided to committee members. In view of Mr. Poutiatine's letter of November 1, Mr. Dougherty expressed the hope that the issue could now be resolved at the December Directors meeting without necessity for any change to the Association's bylaws.

Other Business

Messrs. John Autry and Earl Parker, Johns-Manville Corp., were present during office luncheon to explain details and current

CRMC-MAD-000292

Page 8

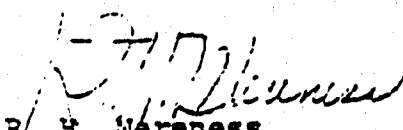
status of the Asbestos Health Hazards Compensation Act, H.R. 8689, which was introduced by Rep. Millicent Fenwick (R-NJ) and others earlier this year. The bill is expected to be scheduled for hearings during next session of Congress. Following discussion, and as an adjunct to the Directors meeting, December 14, it was agreed that Dennis H. Markusson, Legal Affairs Dept., J-M Corp., would be invited to give a presentation on the Act for the benefit of interested directors and others at a dinner on December 13. The Executive Director was requested to so advise directors in meeting announcement and include copy of H.R. 8689 and digest thereof in mailing.

Mr. Dougherty said that the December Directors meeting could be the last one for George Barge prior to his planned retirement April 1, 1978. In recognition of his outstanding and dedicated work on behalf of the Association as a director since 1971, including service on the Executive Committee from September 1974 to September 1977, the Committee agreed and the Executive Director was requested to obtain an appropriate memento for presentation at the December meeting.

The next regular meeting of the Executive Committee is scheduled for Tuesday, December 13, 1977, commencing at 10:00 AM in the Association office.

Adjournment

There being no further business, the meeting was adjourned at 2:45 PM.


R. H. Mereness
Executive Director

22 November 1977

RHM:pl

CRMC-MAD-000293



ASBESTOS INFORMATION ASSOCIATION

1746 Jefferson Davis Highway, Crystal Square 4, Suite 508
Arlington, Virginia 22202 • (703) 878-1150

4 November 1977

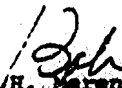
Memorandum For: EXECUTIVE COMMITTEE

Subject: Meeting, Tuesday, November 15

Enclosed please find the agenda for the next regular meeting of the Executive Committee, Tuesday, November 15, commencing at 9:00 AM in the Association's office. Luncheon will be served in the office. Adjournment is expected at about 3:00 PM.

The following materials are forwarded as matters of interest to the Committee:

- A. AIA/NA letter to chief executive officer, Crown Zellerbach Corp. regarding, "Mine Fibers Inc. advertisement in Modern Paint & Coatings. Also, Johns-Manville letter on same subject.
- B. Memo from Director-General, Asbestos International Association enclosing draft resolution (Evans Report) on health hazards of asbestos for European Parliament (Committee on the Environment, Public Health and Consumer Protection).
- C. Letter to Dr. Weill of 10/31/77, correspondence Vanderbilt Co-OSHA to members of Congress.
- D. News clips re Asbestos Health Hazards Compensation Act, H.R. 8689.


R. H. Haraness
Executive Director

RHM:v

Enclosures

CRMC-MAD-000294



ASBESTOS INFORMATION ASSOCIATION

1745 Jefferson Davis Highway, Crystal Square 4, Suite 509
Arlington, Virginia 22202 • (703) 979-1150

EXECUTIVE COMMITTEE MEETING

Association Office

Arlington, Virginia

November 15, 1977

Agenda

- I Minutes of Last Meeting
- II Financial Report
- III Executive Director's Report
 - A. Federal-State Regulatory Activities
 - B. Vanderbilt Co. -- OSHA Congressional Letter Exchange
 - C. Meetings and Activities of Interest
 - D. Directors Meeting, December 14
- IV Standards & Technical Committee Report
 - AIA/NA Dust Sampling and Exchange Program -- Dr. Rhodes
- V "Governmental Activities Committee" -- Mr. Dougherty
 - A. Composition, Tasks & Functions
 - B. Current Items for Consideration
 - 1) OSHA Proposed Generic Cancer Policy
 - 2) OSHA Proposed Rule on Right to Know
(Employee access to log of occupational injuries and illnesses)
 - 3) CPSC Inquiry into "other products which may expose consumers to respirable asbestos fibers"
 - 4) Possible actions on state initiatives
- VI Activity Areas
 - A. Legal-Medical Research Program -- Mr. Gabrielson
 - B. Captive Insurance Program -- Mr. Rainey
 - C. Medical Review -- Mr. Marsh
 - D. International Activities -- Mr. Marsh
 - E. Membership -- Mr. Schwarz
 - F. Public Relations -- Messrs. Schwarz & Zacharias
 - G. Information/Education, Publications -- Mr. Poutiatine
 - H. Asbestos Regulation Task Force -- Mr. Gabrielson
(KRM study, Preparation for public hearing on OSHA standards)

(Over)

Page 2

VII Resolution on Association Representations in
Response to Government Initiatives -- Mr. Dougherty

VIII Draft Budget -- 1978

IX Other Business

.. Next Meeting

X Adjournment

Note: Luncheon will be served in AIA/NA office. John
Autry and Earl Parker of Johns-Manville will dis-
cuss H.R. 8689, "Asbestos Health Hazards Com-
pensation Act"

JM Johns-Manville

Internal Correspondence

To: R. P. Carter
W. A. Cooper
W. B. Reitze

F. J. Solon, Jr.
S. Speil
W. C. Streib

Date: July 31, 1974

From: E. M. Fenner

Copies: File & C

Subject: MEETING - 9:00 A.M., AUGUST 6, 1974
DEFINITION OF AN ASBESTOS FIBER - OSHA STANDARD

- On Calendar

As you are aware, there has been considerable discussion concerning the definition of an asbestos fiber as presently used by OSHA, particularly in regard to the prescribed aspect ratio of 3 to 1.

ASTM has organized Committee E-34, "Committee on Occupational Health and Safety Aspects of Materials, Physical and Biological Agents". There are a number of subcommittees and task groups within this committee. One of these task groups is concerned with "naturally occurring inorganic fibers".

This task group is presently engaged in writing for submittal to OSHA through normal ASTM channels a revised standard for occupational exposure to asbestos fibers. One of the important sections being written by this task group is concerned with the definition of asbestos fiber.

The next meeting of the Task Group on Naturally Occurring Inorganic Fibers takes place on August 14 and 14 in Canada. I would very much like to be able to submit to the group a Johns-Manville definition of an asbestos fiber.

In order to accomplish this, I am requesting that you attend a meeting to discuss the subject at 9:00 A.M. on Tuesday, August 6, in our Conference Room, 4 North.

For background information prior to the meeting, I enclose the following:

- (1) A letter to F. J. Solon, Jr., describing ASTM Committee E-34.
- (2) A definition for asbestos fiber as prepared by a subsection of the task group for affirmative or negative balloting by the group members.

CRMC-MAD-000297

R. P. Carter, et al
Page 2
July 31, 1974

- (3) A series of definitions of asbestos as previously submitted by the following people:
 - A. A. Hodgson, Cape Asbestos Fibres Limited
 - G. Gagnon, Lake Asbestos of Quebec Limited
 - M. Grimard, M.D., Department of National Health & Welfare of Canada
 - R. B. Steele, Asbestos Corporation Limited
 - A. A. Harvey, R. T. Vanderbilt Company
- (4) A definition of an asbestos fiber as prepared by Dr. Steven Holmes of the Asbestosis Research Council.
- (5) The ASTM present definition of asbestos fiber.
- (6) & (6A) Two anonymous definitions of asbestos.
- (7) An anonymous definition of naturally occurring inorganic fibers.
- (8) A copy of the original proposal for the formation of the Task Group on Naturally Inorganic Fibers.
- (9) A listing of active members of the task group and all others on the mailing list for material.

E. M. Fenner

SUPPLEMENTAL LISTING OF DEFINITIONS

19 April 1974

This listing is a supplement to Document No. 5 published as Appendix 6 of the minutes of the second meeting of the Task Group on Naturally Occurring Inorganic Fibers of ASTM Committee E-34.

1. Definitions submitted by Mr. A. A. Hodgson, Cape Asbestos Fibres Limited, 24 Jan 1974.

fibres Fibres are defined as being of a length greater than $5\mu\text{m}$ and having a length/breadth ratio of at least 3:1. There is no upper limit for the length of the fibres, but a maximum diameter of $3\mu\text{m}$ is defined. Airborne asbestos dust concentrations are expressed in fibers per milliliter of air (f/ml).

(taken from the Asbestosis Research Council's Technical Note 1, paragraph 2.1)

asbestos - acicular silicate mineral, with a structure based on silicon - oxygen tetrahedra, composed of crystals in a predominantly parallel orientation, and distinguished by its ability to split indefinitely from its macro form to individual flexible fibrils having minimum length to breadth ratio of 3 to 1 and cross sectional dimensions approaching $0.01\mu\text{m}$.

2. Definitions submitted by Mr. G. Gagnon, Lake Asbestos of Quebec Limited, 28 Jan 1974:

fibre - any material in a form such that it has a minimum ratio of length to average maximum transverse dimensions of 10 to 1.

asbestos fibre - silicate mineral, with a structure based upon silicon - oxygen tetrahedra, that fits the definition of a fibre and is composed of single crystals in predominantly parallel orientation. Common usage also designates a collectivity of asbestos fibres as asbestos fibres.

3. Definitions submitted by Dr. M. Grimard, Chief, Health Effects Division, Environmental Health Directorate, Department of National Health and Welfare of Canada,

fibre - (definition as applied to minerals): any material which by microscopy presents the following optical characteristics: a filiform or bundle of filiform bodies having a length to diameter ratio of at least 3:1

asbestos fiber - acicular silicate mineral, with a structure based upon silicon-oxygen tetrahedra, that fits the definition of a fiber, and is composed of single crystals in predominantly parallel orientation.

4. Definitions submitted by Mr. A. M. Harvey, Manager, Legal and Products Application, R. T. Vanderbilt Company, Inc., 4 Jan 1974:

mineral fiber - any form of mineral characterized by properties of flexibility and length to width ratio of at least 100, and composed of definite crystal unit cells oriented with respect to a specific axis.

asbestos - is a generic term for a number of hydrated silicate minerals that, when crushed or processed, separate into flexible fibers made up of fibrils. These minerals include chrysotile, crocidolite, amosite, anthophyllite asbestos, tremolite asbestos and actinolite asbestos.

5. Definitions submitted by Mr. R. B. Steele, Laboratory Services Engineer, Product Research and Development Department, Asbestos Corporation Limited, 5 March 1974:

Fibril - Is a polymeric form of solid whose component repeating sub-units extend along a single major axis, and which can not be subdivided along this longitudinal axis without destroying the integrity of the structure.

Fiber - Is a bundle of fibrils in parallel alignment, the composite possessing a maximum diameter of 100 microns, and a minimum aspect ratio of 20.

Asbestos - Is a generic term for a number of silicate minerals, the morphology of whose component particles fits the definition of a fiber.

Asbestos Fiber - Is a fiber belonging to one of the six types of asbestos minerals: chrysotile, crocidolite, amosite, anthophyllite asbestos, tremolite asbestos, and actinolite asbestos.

6. Definitions submitted by Mr. A. A. Harvey, Manager, Legal and Products Application, R. T. Vanderbilt Company, Inc., 30 Jan 1974; Definitions taken from pages 26, 27 174 and 175 of the 1973 ASTM Glossary: Refer to page 3.

7. Refer to Appendix 5 and 6 of the minutes of the third meeting of the Task Group on Naturally Occuring Inorganic Fibers.

BD

Environmental Affairs Department
Denver GHQ
March 23, 1973

MEMO TO FILE

TALC PRODUCERS MEETING
W. T. VANDERBILT OFFICES, NEW YORK CITY
MARCH 21, 1973

The major part of the meeting was a presentation by Dr. William Smith of Fairleigh Dickinson University, discussing the results of his asbestos fiber and talc animal studies utilizing hamsters. I consider the following comments made by Dr. Smith to be important information:

- (1) Hamsters were used because their response to asbestos fiber inhalation is very similar to that of man. Additionally, they have a short life span which speeds the determination of results.
- (2) Dr. Smith stated that tremolitic talc was not carcinogenic in his animals. It appeared to be innocuous and induced only minor response.
- (3) As opposed to talc, Dr. Smith reported much carcinogenic activity in his animals with intrapleural dosages of asbestos fiber ranging from 6 to 25 milligrams. He reported that crocidolite was the most carcinogenic, amosite the next and chrysotile the least.

EMF

E. M. Fenner

EMF/emr

C O P Y

BD

October 9, 1974

Mr. H. B. Vanderbilt
President
Chief Executive Officer
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 08855

Dear Mr. Vanderbilt:

This is in reply to your letter of September 26, concerning your request for relief from the asbestos standard for your talcs containing non-fibrous tremolite, actinolite, and anthophyllite.

My letter of August 6 stated that non-fibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the asbestos standard and, therefore, the provisions of that standard do not apply to talc containing non-asbestiform minerals.

NIOSH is currently conducting a thorough investigation into the exact minerals to which talc workers were exposed in those studies where asbestosis or other adverse medical effects were found.

Pending the receipt and evaluation by OSHA of the report by NIOSH on this investigation, if you have scientific evidence that the naturally occurring talcs, prior to processing by milling or crushing, do not contain fibrous or asbestiform tremolite, antophyllite, actinolite or other asbestiform minerals, you may certify to your customers that the talc does not contain asbestos.

Fibrous, asbestiform minerals such as fibrous tremolite means naturally occurring asbestiform minerals which prior to or after crushing and processing, contain fibers made up of fibrils.

Sincerely,

/s/ John H. Stender

John H. Stender
Assistant Secretary of Labor

CRMC-MAD-000302

000000

Johns-Manville Corporation

Greenwood Plaza
Denver, Colorado 80217

BD

Health, Safety & Environment Department

November 21, 1974

Mr. J. S. Gibbons
Manager of Purchases
R. T. Vanderbilt Co., Inc.
30 Winfield St.
Norwalk, CONN 06855

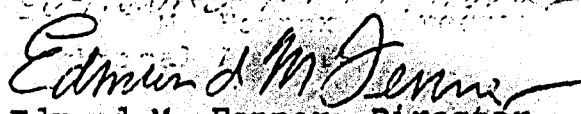
Dear Mr. Gibbons:

Your request for Material Safety Data Sheets has been referred to me for reply.

Enclosed is a U.S. Department of Labor Material Safety Data Sheet for Johns-Manville's MICRO-CEL E.

If additional information is needed, please contact me directly.

Very truly yours,



Edmund M. Fenner, Director
Technical Affairs

EMF/emr

Enc.

CRMC-MAD-000303



Johns-Manville

Internal Correspondence

BD

To: P. Kotin, M.D.

Date: May 26, 1976

From: E. M. Fenner

Copies: G. W. Wright, M.D.
W. B. Reitze

R. P. Carter

Subject: AMERICAN MINING CONGRESS
NONCOAL OCCUPATIONAL HEALTH COMMITTEE

This committee held its first meeting in Washington on Tuesday, May 25.

The first half of the meeting was a discussion of the purpose and scope of the committee. Then considerable time was devoted to comments on the forthcoming meeting of the Federal Metal and Nonmetal Mine Safety Advisory Committee (see copy of our meeting agenda attached).

An item on the Advisory Committee meeting agenda is the MESA suggested revised standard for exposure to asbestos (copy attached). The critical change they proposed is the substitution of the term "mineral fibers" for asbestos, and the elimination of any definition of asbestos. Literal interpretation of the proposed standard could mean that any naturally occurring mineral fiber which meets their definition: "A fiber is defined as a particle that exceeds 5 microns in length but not 5 microns in width and which has a length to width ratio of at least 3 to 1" could be subject to this ruling.

The chairman of the committee, Bernard R. Roy of Amax Inc., appointed an ad hoc subcommittee consisting of:

C. S. Thompson, Ph.D., R. T. Vanderbilt, Chairman
David J. Smith, M.D., U. S. Steel Corporation
Michael J. Doyle, The Hanna Mining Co.
E. M. Fenner

to prepare AMC's comments on the proposed standard and to determine the most effective way of convincing the committee not to endorse the proposal.

For your further information, lists of the Committee members and those attending the May 25 meeting are attached.

May I please have your comments.

E. M. Fenner

CRMC-MAD-000304

2011100

JM Johns-Manville

Internal Correspondence

BD

To: F. J. Solon, Jr.

Date: November 26, 1974

From: E. M. Fenner

Copies: P. Kotin, M.D.
W. B. Reitze

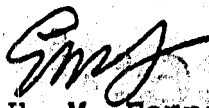
Subject: OSHA Memorandum--Asbestos

R. S. Lamar received a phone call today from Robert Bacon of R. T. Vanderbilt Company. Mr. Bacon called Mr. Lamar when he was unable to contact R. P. Carter.

Mr. Bacon wished to inform Johns-Manville that he had received a copy of an OSHA field memorandum concerning a policy change in the interpretation of the asbestos standard.

Mr. Bacon agreed to send Mr. Lamar a copy of the memorandum and read to him over the phone its major points. These points are:

1. The OSHA microscopist will be instructed to count only fibers, not needlelike particles or slivers. Fibers must be made up of fibrils and have frayed ends. Tremolite is to be considered a sliver.
2. In addition to counting only fibers that meet the above definition, the following size limitation will apply. An aspect ratio of 5 to 1. A fiber diameter not over 3 microns and a fiber length not over 30 microns.


E. M. Fenner



Johns-Manville

Internal Correspondence

Bd

To: P. Kotin, M. D.

Date: March 18, 1975

From: E. M. Fenner

Emf

Copies: File & C

Subject: BORG WARNER TALC SITUATION

Following your suggestion, I talked with John Dement of NIOSH this morning. The main points of information that John supplied are:

- (1) The talc being used by Borg Warner is R. T. Vanderbilt's NYTAL 200.
- (2) Both bulk and airborne samples were taken by the OSHA inspector.
- (3) Their X-ray and electron microscope examination of the talc showed no appreciable chrysotile but considerable amounts of tremolite and anthophyllite.
- (4) Their examination of the samples using the industrial hygiene analysis procedure from the OSHA asbestos standard and using the Stender revised definition of a fiber found approximately 40 fibers per cc in the airborne samples.

John Dement asked that we keep him apprised of developments in the talc situation.



Johns-Manville

Internal Correspondence

C BE

To: R. J. Rushforth - 4S

Date: March 10, 1975

From: E. M. Fenner - 4N *gmx*

Copies: W. B. Reitze - 4N
H. L. Rucker - R&D
H. W. Gilbert - R&D

J. B. Lee - Laurinburg
W. Kiser - Manville
W. A. Brausa - Waukegan

Subject: PHENYL-BETA-NAPHTHYLAMINE
YOUR LETTERS OF FEB. 27 and MARCH 3

W. B. Reitze and I have reviewed your two letters and the attached correspondence, particularly the letter from DuPont and the Material Safety Data Sheet they forwarded to us.

Based on our past experience with DuPont and our knowledge of the thorough product testing they do, we are inclined to believe that the comments on their Material Safety Data Sheet are factual.

It may be that Vanderbilt's Agerite Powder is contaminated with phenyl-beta-naphthylamine and DuPont's product is not.

We have no knowledge of any potential hazard associated with the substitute materials suggested by Research. If you can obtain Material Safety Data Sheets for the other materials, I will be glad to review them with W. B. Reitze and forward you our opinion as to their suitability. However, we see no problem with DuPont's NEOZONE D, based on their letter and Material Safety Data Sheet.

CRMC-MAD-000307

44861

Adm. Table - Gen



Internal Correspondence

(See Memo)

Date: Nov. 6, 1974

From: J. C. Carter

Copy to: File 4

P. Kotin, M.D. - 4N

G. B. Wright, M.D. - 4N

Subject: TALC MEETING - R & D
FRIDAY, NOV. 8, 1974

W. C. Sereib - R&D

F. J. Solon, Jr. - 4N

S. Spell - R&D

E. M. Fenner - 4N

J. P. Leineweber - R&D

H. R. Keefe - 2W

A. C. F. Finkbiner III - 5W

R. S. Lamar - R&D

W. B. Reitze - 4N

As I discussed with each of you, a meeting has now been confirmed for 2:00 P.M. on Friday, November 8, to review our analysis of Vanderbilt's Nytal, to consider the possibility of a meeting with Vanderbilt to review our results and to explore further action which we may want to pursue with respect to the talc labeling situation.

This meeting will be held at the Research and Development Center in the Second Floor Conference Room, West End.

Enclosed is a package of certain documents for you to review prior to the meeting.

Encs.

CRMC-MAD-000308



Johns-Manville

Internal Correspondence

To: F. J. Solon, Jr.

Date: August 21, 1974

From: R. P. Carter

Copies: E. M. Fenner
File & C

Subject: CLASSIFICATION OF TREMOLITE UNDER OSHA ASBESTOS STANDARD
CONVERSATION WITH BOB BACON ON AUGUST 19

Bob Bacon of R. T. Vanderbilt Co. called me on August 19 to advise me that he received a letter last week from John Stender which contained OSHA's opinion as to the applicability of the Asbestos Standard to talc.

Bob read Stender's letter to me over the telephone and indicated that he would immediately send a copy to me air mail. Stender basically stated in his letter that OSHA's Asbestos Standard applied only to fibrous minerals and talc containing non-asbestiform tremolite is not covered within the Standard. Fibers must conform to the definition contained within OSHA's Asbestos Standard to be included therein.

Bob Bacon acted as if he had achieved a victory from OSHA, but the preliminary data we have received from Research concerning our evaluation of their talc, would indicate contrary. However, Vanderbilt is relying on their own conclusion that the tremolite contained in their talc is "non-fibrous".

As you may be aware, R. T. Vanderbilt recently bought International Talc. Bob Bacon indicated that one portion of an International Talc deposit contains a considerable amount of fibrous chrysotile and anthophyllite, in addition to containing a mineralogical phenomenon, fibrous talc. In view of this finding, Vanderbilt intends sometime in the future to insert an asbestos warning label on talc mined from this portion of that particular deposit. However, they have no present intention of labeling any other talc.

Based on the letter which Vanderbilt received from John Stender, it would be my recommendation that we reconvene another meeting with those individuals who attended the talc labeling meeting on July 24, and recommend that we promptly advise our customers of our intention to label talc and to proceed with such labeling.

CRMC-MAD-000309

F. J. Solon, Jr.

Page 2

August 21, 1974

Naturally, we should first carefully review Stender's letter as soon as we receive a copy. It would also be my recommendation that prior to our institution of asbestos warning labels on talc, we should present Vanderbilt with the results of our analysis of their talc and urge them to consider applying a similar label.

In view of the above developments, I see no reason for us to schedule a special meeting with OSHA as was discussed at the July 24 talc labeling meeting.



R. P. Carter

CRMC-MAD-000310

To: F. J. Solon, Jr.

Date: Oct. 4, 1974

From: R. P. Carter

Copies: File & C

Subject: TREMOLITIC TALC

Bob Bacon called me this afternoon to advise me he had received a telephone call from Dan Boyd. Boyd indicated that he had been directed by John Stender to prepare a letter to R. T. Vanderbilt for Stender's signature, advising Vanderbilt that they can certify to their customers that Vanderbilt's talc (NYTAL) does not contain asbestos, provided the talc ore does not contain fibers in R. T. Vanderbilt's judgement. Boyd believes that the letter will be signed early next week.

Boyd indicated to Bacon that this decision was based on guidance from Jon May at NIOSH, who advised OSHA that the evidence currently is inconclusive as to whether tremolite is carcinogenic. Therefore, Vanderbilt should be granted some relief until NIOSH completes its investigation of tremolitic talc.

As soon as this letter is signed by Stender, Boyd agreed to call Bacon and read the contents of the letter to him. Bob Bacon, in turn, has agreed to call me as soon as he hears from Boyd and will immediately forward a copy of the letter to us.

If what Bob Bacon has reported is correct, I am at a loss to understand OSHA's rationale for such action. In the past, OSHA has not hesitated to regulate a substance even though there was little, if any, evidence to establish that a particular substance was harmful to man at certain exposure levels. If such a letter is in fact issued by Stender, then, in effect OSHA would be holding in abeyance the application of the asbestos definition in OSHA's asbestos standard with respect to tremolite.

I advised Bob Bacon that we were still planning to commence the insertion of warning labels on all commercial talc on or about November 1, and would not reconsider this decision until such time as we had an opportunity to review Stender's forthcoming letter.

F. J. Solon, Jr.

Page 2

Oct. 4, 1974

In the event we should decide to schedule a meeting with Howard Shulte, Dan Boyd and Alexander Reis, it might be advisable to first meet with Jon May at NIOSH to ascertain where they stand in their study of tremolitic talc and learn first-hand what his recommendation was to OSHA with respect to Vanderbilt's request. This background may be beneficial to us at a meeting with Shulte, Boyd and Reis.

R. P. Carter

RPC/emr

CRMCMAD-000312



Johns-Manville

Internal Correspondence

To: F. J. Solon, Jr. ✓

Date: Oct. 31, 1974

From: R. P. Carter

Copies: File & C

Subject: TELEPHONE CONVERSATION WITH BOB BACON

Bob Bacon, Assistant to the President, R. T. Vanderbilt Co., called me this morning to advise that our talc labeling decision is causing a "big stink". Vanderbilt's talc customers are very concerned as to why J-M has decided to commence inserting asbestos caution labels on all packages of talc.

R. T. Vanderbilt Co. is of the opinion that it is Johns-Manville's intention to hurt their company. Bob Bacon requested that I bring this matter to the highest level of management within J-M and indicate that Vanderbilt is "very, very upset" with our labeling decision, which they feel will result in "irreparable damage" to them. Bob Bacon indicated that he is going to request Hugh Vanderbilt to personally call a Senior Officer at Johns-Manville to voice their concern.

It has been obvious for some time from my conversations with Bob Bacon that Vanderbilt is very concerned about our talc labeling decision. Without attempting to characterize the motivating factors behind Bob Bacon's frequent telephone conversations to me, their concern may very well be based on a distinct difference between their "corporate conscience" and ours. Certainly, our decision in no way reflects any intention on J-M's part to hurt or destroy Vanderbilt, which is Vanderbilt's current feeling. It is Vanderbilt's opinion that based on John Stender's letter of October 9, 1974, to Hugh Vanderbilt, their talc does not contain asbestiform minerals such as fibrous tremolite. Perhaps that is true, and it is even possible that our talc does not contain asbestiform minerals based on the definition contained in Stender's letter. Basically, Vanderbilt is requesting, if not demanding, that J-M reverse its talc labeling decision based on Stender's letter.

As you will recall, I recommended several weeks ago that we promptly take the following actions in the sequence listed below:

- (1) Reconvene a meeting of the talc labeling group which met early this past Summer to review R&D's analyses of Vanderbilt's Nyltal and to determine J-M policy and action in response to Stender's October 9 letter.

CRMC-MAD-000313

F. J. Solon, Jr.
Page 2
Oct. 31, 1974

- (2) Arrange a meeting in Denver between certain R. T. Vanderbilt personnel and appropriate individuals from R&D to review our analyses of Nyltal and to inform Vanderbilt officially as to J-M policy and contemplated actions on this matter.
- (3) Meet with Jon May and perhaps other NIOSH personnel to review the details of their study of tremolitic talc and their recommendations to OSHA, which I have been told were incorporated in Stender's letter.
- (4) Arrange for a meeting with OSHA, including Alexander Reis, Dan Boyd and Howard Schulte, to discuss the talc labeling situation, and perhaps point out the error in Stender's definition of "fibrous, asbestiform minerals".

I believe this matter warrants our immediate attention.

Dir

R. P. Carter

RPC/emr



Johns-Manville

Internal Correspondence

To: R.P. Carter - 4N

Date: October 25, 1974

From: P.A. Martinson

Copies:

Subject: LABELLING
DESERTALC PRODUCTS

At the F&M Division staff meeting last week, there appeared to be general consensus that J-M should approach R.T. Vanderbilt people and outline, in some detail, why we are taking the position to label our talc products.

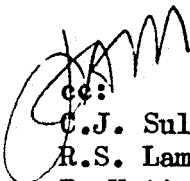
It is the feeling that J-M should not take the position of policing such matters and certainly not suggest to Vanderbilt that they should label their products.

Perhaps, this point can be put across by implication.

Purpose of this letter is to suggest that you discuss the matter with R.S. Lamar. I believe you gentlemen can best resolve at what level the follow up should be made, i.e., Research or your level which essentially would be legal.

I am sure that you are aware that Dick Lamar is acquainted with Mr. Bacon and "Slim" Thompson of Vanderbilt.

Please let me know what is determined after your discussion with Mr. Lamar.


cc:

C.J. Sulewski

R.S. Lamar

P. Kotin

F.J. Solon

W.B. Reitze

A.C.F. Finkbiner

H.R. Keefe

D

C

CRMC-MAD-000315

To: See Below*

Date: July 22, 1974

From: R. P. Carter

Copies: File & C

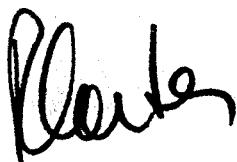
Subject: TALC LABELING MEETING

*H. R. Keefe
Paul Kotin, M.D.
J. A. McKinney
F. L. Pundsack

W. J. Reitze
F. J. Solon, Jr.
S. R. Speil
W. C. Streib

This is to confirm my telephone conversation with each of you, scheduling a meeting for 11:00 a.m. Wednesday, July 24, to discuss our proposed labeling of talc. This meeting will be held in the Small Board Room, Plaza West.

Attached is a memo which I have prepared as background on the tremolite asbestos question. Please read the memo prior to our meeting.





Johns-Manville

Internal Correspondence

To: F. J. Solon, Jr.

Date: July 16, 1974

From: R. P. Carter

Copies: File & Chrono

Subject: TREMOLITE ASBESTOS

Ever since August 12, 1972, when the Food & Drug Administration published a proposed regulation which would prohibit the use of talc containing asbestos in food and food packaging materials, R. T. Vanderbilt Company, a leading talc producer, has taken the position that the tremolite in their talc is not fibrous, but acicula (needle-like), and therefore cannot be considered "asbestos."

Sid Speil, Bill Streib, Dick Lamar and other personnel from J-M, including myself, have attended meetings with Vanderbilt to explore their rationale for such a position. Our Research people have always taken the position that they cannot agree with Vanderbilt's approach, as tremolite is fibrous, but have wished them luck in convincing various government agencies on their position.

Not only has Vanderbilt taken such an approach with FDA, but similarly through meetings, letters and petitions, with other government agencies -- all of this intended to convince them not to classify all tremolite as "asbestos."

Thusfar, Vanderbilt has been successful with two government agencies, EPA and MESA. On May 3, 1974, EPA published an amendment to its April 6, 1973 National Emission Standard for Asbestos, wherein they added the term "commerical asbestos" to distinguish between asbestos that is produced as a product and asbestos that occurs as a contaminant ingredient in other materials. The purpose of adding the term "commercial asbestos" was to make it clear that materials that contain asbestos as a contaminant only, are not covered.

In the May 3 amendment, EPA indicated that questions were raised concerning the applicability of the standard to manufacturing operations that used talc. EPA indicated that when their regulations were first proposed, talc mines were not covered by the EPA proposed standards; this was also intended to indicate that manufacturing operations that used talc or other materials contaminated with asbestos were not covered by the standard.

CRMC-MAD-000317

Page 2
7/16/74

In addition, the information available to EPA at the time of promulgation (April 6, 1973) did not demonstrate that the mining and milling of such materials were major sources of asbestos emissions. Therefore, such materials and manufacturing operations in which they are used are excluded from the EPA Asbestos Emissions Standard.

On July 1, 1974, the US Department of the Interior (MESA) published an asbestos standard for metal and non-metallic open pit mines. In this standard, MESA distinguished between "tremolite asbestos" and "non-asbestiform tremolite."

Tremolite asbestos, under MESA's standard, is covered by a five fiber per cc standard, whereas non-asbestiform tremolite is covered by the ACGIH TLV for tremolite, 5 million particles per cubic foot. MESA, in the standard, indicated that non-asbestiform tremolite which occurs in talc deposits is not mentioned in the definition, therefore, it is not covered. Further, MESA pointed out that on May 8, 1973, a public symposium was held in Washington, D.C., to receive data on talc dust hazards in the metal and non-metallic mining industries. At that time, medical data based on both human and animal studies were presented, supporting the opinion that talc and talc-with-tremolite are not as hazardous as chrysotile and other true asbestos minerals.

I spoke this week with Dr. Aurel Goodwin, Chief of Health Standards for MESA, to ascertain how MESA distinguishes between "tremolite asbestos" and "non-asbestiform tremolite." Dr. Goodwin said that MESA has no exact definition that makes such a distinction, but indicated that "a fiber must look like a fiber"; that is, have an aspect ratio of at least 50-to-1 or 100-to-1, and not merely a 3-to-1 aspect ratio in accordance with OSHA's definition of asbestos.

In addition, MESA agrees with Vanderbilt's position that a distinction should be made between those particles which are truly fibers and those which are needle-like in shape (acicular particles). Dr. Goodwin said further that in all the talc samples they have analyzed, they have detected no asbestos fibers. This apparently supports their conclusion that tremolite, as it exists in commercial talc, is not fibrous.

Dr. Goodwin is presently checking to determine whether or not MESA has examined J-M talc. If not, MESA is agreeable to examining J-M talc to determine if the tremolite it contains is or is not fibrous.

CRMC-MAD-000318

Last week Bob Bacon, Assistant to the President of R. T. Vanderbilt Company, called me to report on a meeting he had on July 2, 1974, with John Stender, Alexander Reis, Howard Schulte and Dan Boyd of OSHA. Bacon reported that Stender was quite sympathetic to Vanderbilt's position and asked Reis: "Why are you holding these people hostage?" According to Bacon, Stender also told Reis that: "OSHA should: 't base standards on things not proven to be guilty." Bacon left the meeting quite optimistic that OSHA would modify its definition of the term "asbestos." Bacon further noted that Dan Boyd, Chief of OSHA's Office of Standards, will visit Vanderbilt's talc mine in New York State on July 19.

It is uncertain at this time whether or not OSHA will modify its present definition of the word "asbestos", in accordance with Vanderbilt's position as was recently done by MESA. However, last week when Ed Fenner, as Chairman of AIA's Technical Committee, met with John O'Neill of OSHA, O'Neill requested that AIA's Committee prepare a new definition of the term, "asbestos."

Notwithstanding the recent action taken by EPA and MESA, Bill Reitze and I do not believe that OSHA will modify its present asbestos standard to conform to the recently promulgated MESA standard. Reitze spoke yesterday with Howard Schulte, Deputy Assistant Secretary for Occupational Safety & Health to check the result of Vanderbilt's meeting with OSHA. Schulte reported that Dan Boyd and someone from NIOSH in Salt Lake City, will visit Vanderbilt's mine this week and will take talc samples to determine if the tremolite present is fibrous or acicula. According to Schulte, even if the tremolite is found to be non-fibrous, OSHA is not planning to change its current asbestos standard with respect to tremolite. However, OSHA would grant Vanderbilt a variance from the OSHA asbestos standard and similar variances to other talc producers whose tremolite content is non-fibrous. However, Schulte told Reitze no decision with respect to Vanderbilt's request will be made until mid-August at the earliest. In the meantime, he cautioned that OSHA has cited and will continue to cite talc producers and their customers for violations of OSHA's asbestos standard.

These recent developments raise a question as to whether J-M should begin to insert "warning" labels on its commercial talc packages. As I see it, three alternative courses of action are available to us. First, we can go ahead with our agreed upon label. Second, we could simply caution with respect to talc dust at the present time, until OSHA makes a decision with respect to tremolite. Third, we could take no action whatsoever until OSHA makes a decision.

Page 4
7/16/74

I would suggest we very promptly call a meeting of the J-M personnel involved to review the current situation and make an interim or final decision. I hope this memo will be helpful as background material to be read by all attendees prior to that meeting.

CRMC-MAD-000320



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

20 JUN 1973

Mr. Allen Harvey
Patent and Legal Department
R. T. Vanderbilt Co., Inc.
33 Winfield Street
East Norwalk, Conn. 06855

Dear Mr. Harvey:

This letter is in response to your inquiry as to the applicability of the asbestos hazardous air pollutant standard to talc milling operations.

The proposed National Emission Standards for Hazardous Air Pollutants (NESHAPS) defined asbestos mill as a facility engaged in the conversion of asbestos ore into commercial asbestos. Since it has been determined that talc milling does not fit this definition, the asbestos standards do not apply to this operation. In addition, it has been determined that the asbestos standards do not apply to any manufacturing processes that use commercial or industrial talc as an ingredient (unless asbestos as defined by 40 CFR 61.21, with the above exception, is used in the process).

It should be noted that 40 CFR 61, NESHAPS, will be amended in order to properly clarify this situation.

Sincerely,

A handwritten signature in dark ink, appearing to read "Richard D. Wilson", written over a horizontal line.

Richard D. Wilson
Director, Division of Stationary
Source Enforcement

CRMC-MAD-000321

R. T. VANDERBILT COMPANY, INC.
30 WINFIELD STREET
NORWALK, CONNECTICUT 06855

CABLE ADDRESS
"BILTVAN" NORWALK, CONNECTICUT
TWX 710-466-2940
(203) 853-1400

July 18, 1978

Mr. Marcel Cossette
Quebec Asbestos Mining Association
University of Sherbrooke, P.Q.
Sherbrooke, QUEBEC J1K 2R1

Dear Mr. Cossette:

It has come to my attention that the requirement for caution labels as stated in paragraph 5.3.1. of the 12th draft of the ASTM E-34 Standard for Occupational Exposure to Asbestos is unworkable as written.

The wording "caution labels should be affixed to all raw materials, mixtures, scrap, waste, debris, and other products containing asbestos fibers, or to their containers," could be interpreted by the courts, in the absence of any qualifying minimum concentration of asbestos fibers in the product, to mean any concentration above zero. Such an interpretation was taken by the courts in the case GAF Corporation v. OSAHRC and Dunlop (No. 76-1028) in relation to the OSHA asbestos standard requirements for medical exams for exposed employees. The court ruled that "concentrations of asbestos", as stated in the regulation, meant any concentration of asbestos above zero.

Obviously, a similar interpretation of "containing asbestos fibers" for purposes of labeling, would mean that the asbestos warning label would be required on mineral product containers where the concentration of asbestos was in the parts per million range. The possibility that this might happen is supported by a recent finding, through Freedom of Information Requests, of a recommendation by the OSHA Solicitor's office that talcs containing any amount of asbestos be labeled with the official Asbestos Warning Label.

It has been argued that the OSHA requirements for labeling products containing asbestos, which uses essentially the same language as the ASTM draft standard, might be interpreted to mean that only products containing sufficient asbestos "so that during any reasonably foreseeable use, handling, storage, disposal, processing, or transportation, no airborne concentrations of asbestos fibers in excess of the prescribed exposure limits" be labeled. Naturally it would be unreasonable to believe that a product containing, for example, 0.1% asbestos could release more than 2 fibers/c.c. under normal conditions of use. But as long as the language of the standard remains vague or unspecific, the courts, in their efforts to favor the protection of the employee, might easily adopt an attitude similar to that applied in the GAF case.

However, the GAF case points out the need for precise terms in regulations of importance to human life. Circuit Judge MacKinnon, in his concurring opinion in the GAF case criticizes the regulation:

CRMC-MAD-000322

29 C.F.R. §1910.1001(b)(1) and (2) (1976). The prescribed standards in these regulations were: "five fibers, longer than 5 micrometers, per cubic centimeter of air," and after July 7, 1976, "two fibers." These standards inform the nation's employers *precisely* what degree of exposure is permitted and what exposure is excessive, but the regulation requiring medical examinations is almost completely deficient in this respect.

What number of fibers, of what length, per what volume of air will constitute a "concentration" is nowhere stated or even hinted at—and like the regulation, the court's opinion leaves the matter completely to conjecture. This is particularly unsettling

to law abiding citizens when the agency is dealing with tremendously minute quantities of infinitesimally small particles. It makes compulsory law enforcement difficult and it lessens the likelihood of voluntary compliance with the law, a result devoutly to be wished. The first requirement for uniform and voluntary compliance with the law is a clear understandable statement of what conduct is required and this regulation falls woefully short of that minimal requirement.

Regulations that have the great importance that this regulation has to human life should be written in more precise terms—so people of ordinary understanding can determine what course of conduct is being required of them. What one person might consider to constitute a "concentration" will differ greatly from the interpretation that another would give to that term; and what one person today might regard *not* to constitute a concentration might be considered tomorrow, on the basis of hindsight as medical knowledge increases, to come within that term.¹

I believe, however, that the Occupational Safety and Health Review Commission should clarify the regulation governing medical examinations so as to give other persons subject to the regulation reasonable notice of some measurable quantity of airborne asbestos the Commission intends to trigger the medical examination requirement. Merely to state that all employers must provide medical examinations whenever their employees are exposed to "concentrations" of asbestos fibers does not provide an ascertainable standard for those who wish to comply with the law.

For the above reasons we believe the language of paragraph 5.3.1. concerning caution labels should read:

CRMC-MAD-000323

Caution labels should be affixed to all raw materials, mixtures, scrap, waste, debris, and other products containing more than 1 percent asbestos on a dry weight basis or to their containers, except that no label is required where asbestos fibers have been modified by a bonding agent, coating, binder, or other material so that during any reasonably foreseeable use, handling, storage, disposal, processing, or transportation, no airborne concentrations of asbestos fibers in excess of the exposure limits prescribed in 5.1 will be released.

This is the same exclusion allowed in the EPA National Emission Standard for Asbestos (Federal Register 38, 8829 April 6, 1973), for spraying, which reads:

(e) Spraying: There shall be no visible emissions to the outside air from spray-on application of materials containing more than 1 percent asbestos, on a dry weight basis, used to isolate

Furthermore, the practice of setting exclusion levels for regulated materials has been followed by OSHA in the case of the 14 carcinogens (29CFR 1910.1003 through 1910.1016) wherein exclusion levels of 0.1 and 1.0 percent were allowed for various carcinogenic chemicals before the regulation applied, and more recently in the case of the OSHA benzene standard (29CFR 1910.1028) wherein there is no warning label requirement for mixtures containing 0.5 percent benzene (0.1 percent after June 27, 1981).

The practice of choosing exclusion levels for regulated materials could be considered as an effort by OSHA and other regulating agencies to now recognize "feasibility" in the development of standards. It would not be feasible to analyze all silicate mineral mixtures for any asbestos content, yet a requirement to label talcs or any other silicate minerals assemblages such as pyrophyllite, kaolin, montmorillonite, etc. containing any asbestos would obligate the producers of many non-beneficiated mineral products to maintain an extremely costly program of trace analysis.

In addition to feasibility, the agencies are also questioning the necessity of stringent regulation in areas such as label requirements. The exception to labeling in the OSHA standard for materials containing asbestos that has been modified with a binder, etc., is evidence of a recognition that only trace amount of asbestos will be released by the normal handling of these products. If only trace amounts of asbestos can be released from a non-modified mixture containing a low percentage of asbestos, then there is similarly no need to label or regulate the mixture.

In a final consideration of the need to stipulate a concentration of asbestos in a mineral product mixture below which no warning label would be required the state of the art of asbestos detection and counting should be recognized. Despite some published reports that concentrations of asbestos below 1 percent can be detected with accuracy, it remains that the accurate identification and quantitative determina-

CRMC-MAD-000324

tion of some of the amphibole varieties of asbestos in an unknown mixture is difficult below 5 percent and almost impossible below 2 percent by weight concentration. This coupled with the present unresolved controversy over the definition of an asbestos fiber favors the setting of a minimum asbestos concentration for purposes of labeling requirements in the ASTM draft standard for asbestos.

I would be pleased to discuss this matter further at our next meeting of E-34 committee.

Sincerely,

R. T. VANDERBILT COMPANY, INC.

Allan M. Harvey

Allan M. Harvey, Manager
Technical Development Department

AMH:lsm

CRMC-MAD-000325



Johns-Manville

Internal Correspondence

To: F. J. Solon, Jr.

Date: July 16, 1974

From: R. P. Carter

Copies: File & Chrono

Subject: TREMOLITE ASBESTOS

Ever since August 12, 1972, when the Food & Drug Administration published a proposed regulation which would prohibit the use of talc containing asbestos in food and food packaging materials, R. T. Vanderbilt Company, a leading talc producer, has taken the position that the tremolite in their talc is not fibrous, but acicula (needle-like), and therefore cannot be considered "asbestos."

Sid Speil, Bill Streib, Dick Lamar and other personnel from J-M, including myself, have attended meetings with Vanderbilt to explore their rationale for such a position. Our Research people have always taken the position that they cannot agree with Vanderbilt's approach, as tremolite is fibrous, but have wished them luck in convincing various government agencies on their position.

Not only has Vanderbilt taken such an approach with FDA, but similarly through meetings, letters and petitions, with other government agencies -- all of this intended to convince them not to classify all tremolite as "asbestos."

Thusfar, Vanderbilt has been successful with two government agencies, EPA and MESA. On May 3, 1974, EPA published an amendment to its April 6, 1973 National Emission Standard for Asbestos, wherein they added the term "commercial asbestos" to distinguish between asbestos that is produced as a product and asbestos that occurs as a contaminant ingredient in other materials. The purpose of adding the term "commercial asbestos" was to make it clear that materials that contain asbestos as a contaminant only, are not covered.

In the May 3 amendment, EPA indicated that questions were raised concerning the applicability of the standard to manufacturing operations that used talc. EPA indicated that when their regulations were first proposed, talc mines were not covered by the EPA proposed standards; this was also intended to indicate that manufacturing operations that used talc or other materials contaminated with asbestos were not covered by the standard.

CRMC-MAD-000326

In addition, the information available to EPA at the time of promulgation (April 6, 1973) did not demonstrate that the mining and milling of such materials were major sources of asbestos emissions. Therefore, such materials and manufacturing operations in which they are used are excluded from the EPA Asbestos Emissions Standard.

On July 1, 1974, the US Department of the Interior (MESA) published an asbestos standard for metal and non-metallic open pit mines. In this standard, MESA distinguished between "tremolite asbestos" and "non-asbestiform tremolite."

Tremolite asbestos, under MESA's standard, is covered by a five fiber per cc standard, whereas non-asbestiform tremolite is covered by the ACGIH TLV for tremolite, 5 million particles per cubic foot. MESA, in the standard, indicated that non-asbestiform tremolite which occurs in talc deposits is not mentioned in the definition, therefore, it is not covered. Further, MESA pointed out that on May 8, 1973, a public symposium was held in Washington, D.C., to receive data on talc dust hazards in the metal and non-metallic mining industries. At that time, medical data based on both human and animal studies were presented, supporting the opinion that talc and talc-with-tremolite are not as hazardous as chrysotile and other true asbestos minerals.

- I spoke this week with Dr. Aurel Goodwin, Chief of Health Standards for MESA, to ascertain how MESA distinguishes between "tremolite asbestos" and "non-asbestiform tremolite." Dr. Goodwin said that MESA has no exact definition that makes such a distinction, but indicated that "a fiber must look like a fiber"; that is, have an aspect ratio of at least 50-to-1 or 100-to-1, and not merely a 3-to-1 aspect ratio in accordance with OSHA's definition of asbestos.

In addition, MESA agrees with Vanderbilt's position that a distinction should be made between those particles which are truly fibers and those which are needle-like in shape (acicula particles). Dr. Goodwin said further that in all the talc samples they have analyzed, they have detected no asbestos fibers. This apparently supports their conclusion that tremolite, as it exists in commercial talc, is not fibrous.

Dr. Goodwin is presently checking to determine whether or not MESA has examined J-M talc. If not, MESA is agreeable to examining J-M talc to determine if the tremolite it contains is or is not fibrous.

Last week Bob Bacon, Assistant to the President of R. T. Vanderbilt Company, called me to report on a meeting he had on July 2, 1974, with John Stender, Alexander Reis, Howard Schulte and Dan Boyd of OSHA. Bacon reported that Stender was quite sympathetic to Vanderbilt's position and asked Reis: "Why are you holding these people hostage?" According to Bacon, Stender also told Reis that: "OSHA shouldn't base standards on things not proven to be guilty." Bacon left the meeting quite optimistic that OSHA would modify its definition of the term "asbestos." Bacon further noted that Dan Boyd, Chief of OSHA's Office of Standards, will visit Vanderbilt's talc mine in New York State on July 19.

It is uncertain at this time whether or not OSHA will modify its present definition of the word "asbestos", in accordance with Vanderbilt's position as was recently done by MESA. However, last week when Ed Fenner, as Chairman of AIA's Technical Committee, met with John O'Neill of OSHA, O'Neill requested that AIA's Committee prepare a new definition of the term, "asbestos."

Notwithstanding the recent action taken by EPA and MESA, Bill Reitze and I do not believe that OSHA will modify its present asbestos standard to conform to the recently promulgated MESA standard. Reitze spoke yesterday with Howard Schulte, Deputy Assistant Secretary for Occupational Safety & Health to check the result of Vanderbilt's meeting with OSHA. Schulte reported that Dan Boyd and someone from NIOSH in Salt Lake City, will visit Vanderbilt's mine this week and will take talc samples to determine if the tremolite present is fibrous or acicula. According to Schulte, even if the tremolite is found to be non-fibrous, OSHA is not planning to change its current asbestos standard with respect to tremolite. However, OSHA would grant Vanderbilt a variance from the OSHA asbestos standard and similar variances to other talc producers whose tremolite content is non-fibrous. However, Schulte told Reitze no decision with respect to Vanderbilt's request will be made until mid-August at the earliest. In the meantime, he cautioned that OSHA has cited and will continue to cite talc producers and their customers for violations of OSHA's asbestos standard.

These recent developments raise a question as to whether J-M should begin to insert "warning" labels on its commercial talc packages. As I see it, three alternative courses of action are available to us. First, we can go ahead with our agreed upon label. Second, we could simply caution with respect to talc dust at the present time, until OSHA makes a decision with respect to tremolite. Third, we could take no action whatsoever until OSHA makes a decision.

CRMC-MAD-000328

Page 4
7/16/74

I would suggest we very promptly call a meeting of the J-M personnel involved to review the current situation and make an interim or final decision. I hope this memo will be helpful as background material to be read by all attendees prior to that meeting.

CRMC-MAD-000329



Johns-Manville

Internal Correspondence

To: F. J. Solon, Jr.

Date: Oct. 31, 1974

From: R. P. Carter

Copies: File & (C)

Subject: TELEPHONE CONVERSATION WITH BOB BACON

Bob Bacon, Assistant to the President, R. T. Vanderbilt Co., called me this morning to advise that our talc labeling decision is causing a "big stink". Vanderbilt's talc customers are very concerned as to why J-M has decided to commence inserting asbestos caution labels on all packages of talc.

R. T. Vanderbilt Co. is of the opinion that it is Johns-Manville's intention to hurt their company. Bob Bacon requested that I bring this matter to the highest level of management within J-M and indicate that Vanderbilt is "very, very upset" with our labeling decision, which they feel will result in "irreparable damage" to them. Bob Bacon indicated that he is going to request Hugh Vanderbilt to personally call a Senior Officer at Johns-Manville to voice their concern.

It has been obvious for some time from my conversations with Bob Bacon that Vanderbilt is very concerned about our talc labeling decision. Without attempting to characterize the motivating factors behind Bob Bacon's frequent telephone conversations to me, their concern may very well be based on a distinct difference between their "corporate conscience" and ours. Certainly, our decision in no way reflects any intention on J-M's part to hurt or destroy Vanderbilt, which is Vanderbilt's current feeling. It is Vanderbilt's opinion that based on John Stender's letter of October 9, 1974, to Hugh Vanderbilt, their talc does not contain asbestiform minerals such as fibrous tremolite. Perhaps that is true, and it is even possible that our talc does not contain asbestiform minerals based on the definition contained in Stender's letter. Basically, Vanderbilt is requesting, if not demanding, that J-M reverse its talc labeling decision based on Stender's letter.

As you will recall, I recommended several weeks ago that we promptly take the following actions in the sequence listed below:

- (1) Reconvene a meeting of the talc labeling group which met early this past Summer to review R&D's analyses of Vanderbilt's Nytal and to determine J-M policy and action in response to Stender's October 9 letter.

CRMC-MAD-000330

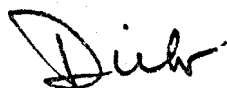
F. J. Solon, Jr.

Page 2

Oct. 31, 1974

- (2) Arrange a meeting in Denver between certain R. T. Vanderbilt personnel and appropriate individuals from R&D to review our analyses of Nytal and to inform Vanderbilt officially as to J-M policy and contemplated actions on this matter.
- (3) Meet with Jon May and perhaps other NIOSH personnel to review the details of their study of tremolitic talc and their recommendations to OSHA, which I have been told were incorporated in Stender's letter.
- (4) Arrange for a meeting with OSHA, including Alexander Reis, Dan Boyd and Howard Schulte, to discuss the talc labeling situation, and perhaps point out the error in Stender's definition of "fibrous, asbestiform minerals".

I believe this matter warrants our immediate attention.



R. P. Carter

RPC/emr

CRMC-MAD-000331



Johns-Manville

Internal Correspondence

To: F. J. Solon, Jr.

Date: August 21, 1974

From: R. P. Carter

Copies: E. M. Fenner
File & C

Subject: CLASSIFICATION OF TREMOLITE UNDER OSHA ASBESTOS STANDARD
CONVERSATION WITH BOB BACON ON AUGUST 19

Bob Bacon of R. T. Vanderbilt Co. called me on August 19 to advise me that he received a letter last week from John Stender which contained OSHA's opinion as to the applicability of the Asbestos Standard to talc.

Bob read Stender's letter to me over the telephone and indicated that he would immediately send a copy to me air mail. Stender basically stated in his letter that OSHA's Asbestos Standard applied only to fibrous minerals and talc containing non-asbestiform tremolite is not covered within the Standard. Fibers must conform to the definition contained within OSHA's Asbestos Standard to be included therein.

Bob Bacon acted as if he had achieved a victory from OSHA, but the preliminary data we have received from Research concerning our evaluation of their talc, would indicate contrary. However, Vanderbilt is relying on their own conclusion that the tremolite contained in their talc is "non-fibrous".

As you may be aware, R. T. Vanderbilt recently bought International Talc. Bob Bacon indicated that one portion of an International Talc deposit contains a considerable amount of fibrous chrysotile and anthophyllite, in addition to containing a mineralogical phenomenon, fibrous talc. In view of this finding, Vanderbilt intends sometime in the future to insert an asbestos warning label on talc mined from this portion of that particular deposit. However, they have no present intention of labeling any other talc.

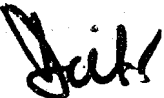
Based on the letter which Vanderbilt received from John Stender, it would be my recommendation that we reconvene another meeting with those individuals who attended the talc labeling meeting on July 24, and recommend that we promptly advise our customers of our intention to label talc and to proceed with such labeling.

CRMC-MAD-000332

F. J. Solon, Jr.
Page 2
August 21, 1974

Naturally, we should first carefully review Stender's letter as soon as we receive a copy. It would also be my recommendation that prior to our institution of asbestos warning labels on talc, we should present Vanderbilt with the results of our analysis of their talc and urge them to consider applying a similar label.

In view of the above developments, I see no reason for us to schedule a special meeting with OSHA as was discussed at the July 24 talc labeling meeting.



R. P. Carter

file 2
Johns-Manville

Internal Correspondence

To: R. S. Lamar - R&D

Date: October 23, 1974

From: V. E. Wolkodoff - R&D

Copies: Distribution on Reverse Side

Subject: TEM AND SELECTED AREA DIFFRACTION PATTERNS OF ASBESTOS MINERALS IN FOUR TALC SAMPLES PRODUCED BY R. T. VANDERBILT COMPANY

1. At your request, I was able to contract time on the Philips 200 electron microscope at Denver Research Institute to confirm by selected area diffraction patterns, the presence of chrysotile, anthophyllite and tremolite in all the R. T. Vanderbilt talcs designated Nytal 200, Nytal 400, Asbestine 3X, and Asbestine 325X (please refer to my letter of October 9, 1974, which is based basically on FDA optical methods and the use of our RCA electron microscopes to confirm chrysotile). It was felt that selected area diffraction patterns of the asbestos minerals using the Philips 200 would lend positive identification - a type of analysis which cannot be done on our RCA EMU-3B model.
2. Table No. 1 not only identifies samples, but also identifies all TEM prints and selected area diffraction patterns of the 33 prints attached to this letter. The TEM plates are always on file. The microscope constant ($L \lambda$) was derived by averaging 21 microscope constant values based on lines of Au and Pd. The microscope constant is:

$$L \lambda = 4.451 \text{ \AA cm} \pm 0.003$$

To calculate d-spacing in Angstrom units, the following formula was used:

$$\frac{L \lambda \text{ (\AA cm)}}{\text{spot pair radius (cm)}} = \text{d-spacing (\AA)}$$

3. Chrysotile, anthophyllite, and tremolite were all found in each of the four R. T. Vanderbilt talc samples. Particular data for each sample are found in Table No. 1 and appropriate attached electron diffraction patterns.

V. E. Wolkodoff
V. E. Wolkodoff

Attachments



Johns-Manville

Internal Correspondence

To: Filtration and Minerals
Environmental Committee Members*

Date: July 17, 1974

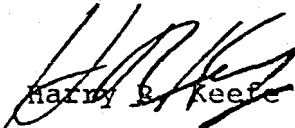
From: Harry R. Keefe

Copies: Listed Below

Subject: Talc Labeling

*E. M. Fenner	W. B. Reitze	G. Swallow ✓
R. P. Carter	S. W. Schulmeyer	R. S. Lamar
W. A. Cooper	F. J. Solon, Jr.	E. Parker
D. E. Hillier	W. C. Streib	
T. M. Jackson	A. Finkbinder	
R. W. McIndoe	P. Kotin, M.D.	

Re my letter of June 21, 1974. In view of the recent development with R. T. Vanderbilt and Mesa, information published in the Federal Register of July 1, 1974, there appears to be some confusion as to the definition of tremolite in talc as an asbestos fiber. After discussions with E. Fenner and R. Carter, it is the decision of the Filtration and Minerals Division to hold in abeyance our labeling plans for talc until an emergency meeting of the Filtration and Minerals Environmental Committee is held. F. Solon is requested to call such a meeting to determine the significance of the above mentioned published information.


Harry R. Keefe

HRK:ccr

cc: C. J. Sulewski
W. L. VanDerbeek
P. A. Martinson
H. Kranich
N. B. Scheffel
G. Coombs
R. G. Riede
K. R. Comann
D/C

CRMC-MAD-000335

1
2 second?

3 MR. HULCE: I second the motion.

4 THE PRESIDENT: Are there any
5 questions?

6 MRS. DAVIS: First of all, on
7 the subject of the legal fees, which is in my resolution,
8 I want to ask the auditors what they are doing to check
9 the legal fees and to see that all those are ordinary
10 and necessary expenses and what they are doing to check
11 kickbacks, if any, to the general counsel and corporate
12 secretary and what was the total amount of legal fees.

13 THE PRESIDENT: The total amount
14 of legal fees was \$1,101,322 to outside attorneys.
15 Internal expenses were \$571,398.

16 MRS. DAVIS: That's for house
17 counsel. I want to bring to the attention of the
18 stockholders too that President Carter denounced the
19 lawyers today in a speech, and this I'm sure everyone
20 has seen in the Wall Street Journal and the Boston
21 Globe, and a lot of these expenses are not ordinary.
22 Here I read one sentence by Curtis Wilkie of the Boston
23 Globe Bureau in Washington: "President Carter scolded
24 the legal profession for long, high fees, elitism
25 and opposition to change" etcetera, so it shows

1
2 that President Carter agrees with that. He has seen
3 some of my resolutions and he got some of his ideas
4 from Evelyn Davis. After all, people say something
5 like we won't make it to Broadway. I was recognized
6 as an editor by the President. Some people can not
7 even go to the ladies room in the White House.

8 I'm asking for the accountant.

9 I'm asking and want to know what they are doing to check
10 these legal fees, and that they are ordinary and
11 necessary. I want to know from them what they are
12 doing about it.

13 FROM THE FLOOR: We examine legal
14 fees in the same manner that we examine other expenses
15 of the corporation. Basically, those procedures would
16 be reviewing legal disbursements to determine the
17 nature of them and also discussing them with legal
18 counsel in the company.

19 MRS. DAVIS: On the subject of
20 political contributions, and we do have some ex-politi-
21 cians or politicians like Governor Love and Mr. Zwick
22 and the gentleman from Canada was also in politics,
23 how is it now with political contributions?

24 THE PRESIDENT: I'll answer that
25 we made contributions in Canada of \$3,650.

1
2 MRS. DAVIS: What about Colorado?

3 What about the State of Massachusetts? Any?

4 THE PRESIDENT: No.

5 MRS. DAVIS: Have you been
6 supporting Dukakis, Senator Mogan and Kennedy and
7 Tip O'Neil?

8 THE PRESIDENT: The only political
9 contribution made by the corporation or any of the
10 subsidiaries was the \$3,650 contributed in Canada.

11 MRS. DAVIS: Do we have a so-called
12 pact, a political axe committee, and what are the auditors
13 doing to check that?

14 THE PRESIDENT: We do have one.

15 MRS. DAVIS: How much is that?

16 THE PRESIDENT: Well, we collected
17 \$8,500.

18 MRS. DAVIS: Who were some of the
19 candidates? Did any of them go to Massachusetts?

20 THE PRESIDENT: We have not yet
21 distributed it so far as I know, but the rules of the
22 pact, which isn't called pact anymore---we have another
23 name for it but under those rules the contributions
24 must be made to candidates or potential candidates
25 who support the free enterprise system.

1
2 MRS. DAVIS: Well, some do part
3 of the time. We could say Tip O'Neil and Senator
4 Kennedy and Senator Brooke are supporting the free
5 enterprise system.

6 THE PRESIDENT: I don't think we
7 have contributed to them.

8 MRS. DAVIS: I see. You may not
9 be able to have a lot of eating in Massachusetts.
10 Who knows?

11 I have one more point on charitable
12 contributions. What are the auditors doing to audit
13 those, that they really go to charities and that they
14 aren't political contributions? What was the total
15 amount?

16 THE PRESIDENT: I can give you
17 the total amount on the charitable contributions and
18 the auditors can answer the rest of it. In 1977 we
19 contributed a total of \$570,000.

20 MRS. DAVIS: How much of that went
21 to charities, which officers and directors were
22 connected with?

23 THE PRESIDENT: I don't think I can
24 give it to you that way. The data doesn't show it that
25 way.



Johns-Manville

Internal Correspondence

To: See below*

Date: November 7, 1974

From: Paul Kotin, M.D., 4N

NOV 8 1974

Copies: F. J. Solon, Jr.
R. Carter

28

Subject: TALC LABELING

*W. R. Goodwin, 5W
F. H. May, Jr., 5W
J. A. McKinney, 5W

✓ F. L. Pundsack, R&D
C. J. Sulewski, 2W
W. L. VanDerbeek, 2S

We have been informed by Mr. Robert Bacon, Assistant to the President of R. T. Vanderbilt Company (a major talc competitor) that J-M's decision to insert asbestos caution labels on all talc shipments will result in "irreparable damage" to Vanderbilt. Mr. Bacon requested that this matter be brought to the attention of the highest level of management, and he stated that he was asking Mr. Hugh Vanderbilt, President of R. T. Vanderbilt, to call a senior officer at J-M to voice their concern and their belief that it is J-M's intention to hurt their company.

The purpose of this memorandum is to alert you to the situation in the event you are contacted by Mr. Vanderbilt. Our decision to label talc was based on our conviction that J-M's talc contains fibrous asbestos and in no way reflects any intention to hurt or destroy the Vanderbilt Company. If you would like additional details on this matter, please call me.

CRMC-MAD-000340

0017 0202

Johns-Manville

Internal Circulation

R. S. Lamar - R&D

Date: October 23, 1974

V. E. Wolkodoff - R&D

Distribution on Reverse Side

Subject: TEM AND SELECTED AREA DIFFRACTION PATTERNS OF ASBESTOS MINERALS IN FOUR TALC SAMPLES PRODUCED BY R. T. VANDERBILT COMPANY

1. At your request, I was able to contract time on the Philips 200 electron microscope at Denver Research Institute to confirm by selected area diffraction patterns, the presence of chrysotile, anthophyllite and tremolite in all the R. T. Vanderbilt talcs designated Nyal 200, Nyal 400, Asbestine 3X, and Asbestine 325X (please refer to my letter of October 9, 1974, which is based basically on FDA optical methods and the use of our RCA electron microscopes to confirm chrysotile). It was felt that selected area diffraction patterns of the asbestos minerals using the Philips 200 would lend positive identification - a type of analysis which cannot be done on our RCA EMU-3B model.
2. Table No. 1 not only identifies samples, but also identifies all TEM prints and selected area diffraction patterns of the 33 prints attached to this letter. The TEM plates are always on file. The microscope constant ($L \lambda$) was derived by averaging 21 microscope constant values based on lines of Au and Pd. The microscope constant is:

$$L \lambda = 4.451 \text{ Å cm} \pm 0.003$$

To calculate d-spacing in Angstrom units, the following formula was used:

$$\frac{L \lambda (\text{Å cm})}{\text{spot pair radius (cm)}} = \text{d-spacing (Å)}$$

3. Chrysotile, anthophyllite, and tremolite were all found in each of the four R. T. Vanderbilt talc samples. Particular data for each sample are found in Table No. 1 and appropriate attached electron diffraction patterns.

V. E. Wolkodoff

V. E. Wolkodoff

jc

Attachments

Distribution:

R. P. Carter*	- 4N	F. L. Pundsack
E. M. Fenner	- 4N	J. P. Leineweber*
Paul Kotin, M.D.	- 4N	W. C. Streib
W. B. Reitze	- 4N	S. Speil*
F. J. Solon, Jr.	- 4N	R. S. Lamar*
G. L. Swallow	- 4N	V. E. Wolkodoff*
A. C. F. Finkbiner, III	- 5W	
J. A. McKinney	- 5W	
H. R. Keefe*	- 2W	
P. A. Martinson	- 2W	
C. J. Sulewski	- 2W	
W. L. VanDerbeek	- 2S	
R. G. Riede	- 2S	

*Prints attached only to those names followed by asterisk.

CRMC-MAD-000342

0017 0204

AC 150

TABLE 1

TEM Tabulation of Micrographs and Selected Area Diffraction
Patterns of Four Talc Samples From R. T. Vanderbilt Co.

No.	Lab. No.	Vanderbilt Designation	TEM Plate No., Magnification	Selected Area Diffraction Pattern, 35X	Remarks
1	RC 74255-1	Nytal 200	2301A, 11,000X	-	-
2	RC 74255-1	Nytal 200	2317A, 16,000X	-	-
3	RC 74255-1	Nytal 200	2305A, 22,000X	-	Chrysotile fiber
4	RC 74255-1	Nytal 200	-	2305B	Pattern is of widest fiber in 2305A, Chrysotile
5	RC 74255-1	Nytal 200	2306A, 22,000X	-	Anthophyllite fiber
6	RC 74255-1	Nytal 200	-	2306B	Anthophyllite fiber in 2306A
7	RC 74255-1	Nytal 2-0	2307A, 22,000X	-	Tremolite fiber
8	RC 74255-1	Nytal 200	-	2307B	Tremolite fiber in 2307A
9	RC 74255-2	Nytal 400	2302D, 11,000X	-	-
10	RC 74255-2	Nytal 400	2318C, 16,000X	-	-
11	RC 74255-2	Nytal 400	2308A, 22,000X	-	Chrysotile fiber
12	RC 74255-2	Nytal 400	-	2308B	Pattern of Chrysotile above
13	RC 74255-2	Nytal 400	2309A, 22,000X	-	Anthophyllite fiber
14	RC 74255-2	Nytal 400	-	2309B	Pattern of Anthophyllite above
15	RC 74255-2	Nytal 400	2310A, 22,000X	-	Tremolite fiber
16	RC 74255-2	Nytal 400	-	2310B	Pattern of Tremolite above
17	RC 74255-3	Asbestine 3X	2303D, 11,000X	-	-
18	RC 74255-3	Asbestine 3X	2319D, 16,000X	-	-
19	RC 74255-3	Asbestine 3X	2311A, 22,000X	-	Chrysotile fiber on bottom
20	RC 74255-3	Asbestine 3X	-	2311B	Pattern of Chrysotile above
21	RC 74255-3	Asbestine 3X	2312A, 22,000X	-	Anthophyllite fiber
22	RC 74255-3	Asbestine 3X	-	2312B	Pattern of Anthophyllite above
23	RC 74255-3	Asbestine 3X	2313A, 22,000X	-	Tremolite fiber
24	RC 74255-3	Asbestine 3X	-	2313B	Pattern of Tremolite above
25	RC 74255-4	Asbestine 325	2304A, 11,000X	-	-
26	RC 74255-4	Asbestine 325	2322A, 16,000X	-	Fiber is commingled Chrysotile and Amphibole

CRMC-MAD-000343

0017 0205

(2)

Table 1 continued

No.	Lab. No.	Vanderbilt Designation	TEM Plate No., Magnification	Selected Area Diffraction Pattern, 35X	Remarks
27	RC 74255-4	Asbestine 325	-	2322B	Chrysotile pattern superimposed on Amphibole pattern
28	RC 74255-4	Asbestine 325	2314A, 22,000X	-	Chrysotile fiber
29	RC 74255-4	Asbestine 325	-	2314B	Pattern of Chrysotile above
30	C 74255-4	Asbestine 325	2315A, 22,000X	-	Longest fiber is Anthophyllite
31	RC 74255-4	Asbestine 325	-	2315B	Pattern of Anthophyllite above
32	RC 74255-4	Asbestine 325	2316A, 22,000X	-	Largest fiber is Tremolite
33	RC 74255-4	Asbestine 325	-	2316B	Pattern of Tremolite above

CRMCMAD-000344

Johns-Manville

Internal Correspondence

To: V. E. Wolkodoff

Date: October 11, 1974

From: R. S. Lamar

Copies: See end of correspondence

Subject: YOUR MEMO OF OCTOBER 9, 1974
OPTICAL AND TEM COUNTING OF ASBESTOS MINERALS IN
ASBESTINE 3X, ASBESTINE 325, NYTAL 200, AND NYTAL 400
AS CURRENTLY PRODUCED BY R. T. VANDERBILT CO.

Thank you Vlad for your very fine report covering your microscopic examination of these samples. Your data confirm analyses we have had made on these same samples by J. P. McGourty using X-ray diffraction techniques (Report No. 414-T-33) and by K. Jaunaraajs using differential thermal analysis - primarily for the detection of serpentine mineral.

These present samples are really no different from previous samples of Nyal and Asbestine that I have examined periodically over the years. They all contain very substantial amounts of both tremolite and chrysotile and in two cases substantial amounts of a third asbestos mineral, anthophyllite.

In numerous discussions I have had with R. T. Vanderbilt people, they have readily admitted to having tremolite ("which is not an asbestos mineral and is not fibrous"), but they have never admitted to the presence of either chrysotile or anthophyllite. They do admit that years ago, when they were deliberately mining certain sections of their deposits for fiber, some of their products did contain chrysotile. This product, "Mouldene," was sold as a direct replacement for asbestos in the manufacture of vinyl tile. I have examined "Mouldene" in the past and it was in fact almost entirely chrysotile. "Mouldene" is no longer being made, but all of the International Talc Company and R. T. Vanderbilt Company talc products always have and continue to contain chrysotile as a significant mineral component (in addition to tremolite and anthophyllite).

CRMC-MAD-000345

0017 0207

AC 150

V. E. Wolkodoff

-2-

October 11, 1974

It is apparent that the R. T. Vanderbilt presentations to OSHA, NIOSH, FDA, MESA, etc. are based on something less than the truth. I find it difficult to believe that they could be so grossly misinformed as to what their materials really are.

How this information is ultimately used is something that will have to be decided at higher levels within J-M. However, it is my belief that R. T. Vanderbilt, with a continuance of their present methods, does nothing but confuse the issue among the tale producers and with the various Federal agencies involved. Any properly informed person would know that they are wrong.

R. S. Lamar

R. S. Lamar

kjm

cc:

R. P. Carter	- 4N	F. L. Pundsack
E. M. Fenner	- 4N	W. C. Stroib
P. Kotin	- 4N	J. P. Leinoweber
W. B. Reitze	- 4N	S. Speil
F. J. Solon, Jr.	- 4N	A. J. McArthur
G. L. Swallow	- 4N	
A. C. F. Finkbiner, III	- 5W	
J. A. McKinney	- 5W	
H. R. Keefe	- 2W	
P. A. Martinson	- 2W	
C. J. Sulewski	- 2W	
W. L. VanDerbeek	- 2S	
R. G. Riede	- 2S	

File 414-C R. T. Vanderbilt

CRMC-MAD-000346

0017 0208



8/28/73
Internal Correspondence

To: F. L. Pundsack - R&D Center Date: August 28, 1973

From: S. Speil - R&D Center

Copies:

Subject: TREMOLITE IN TALC

BU 10/31

You asked that I review the background for our decision not to support Vanderbilt's claim that "tremolite is not asbestos".

I need not dwell on the technical reasons involved since you are well acquainted with these. However, to summarize briefly, tremolite is an amphibole mineral differing from amosite, crocidolite, and other amphiboles only in the substitution of calcium for part of the magnesium, iron, and/or sodium present in the internal structure of other amphiboles. Fibers of tremolite and actinolite are generally much shorter and usually more brittle than those of crocidolite and amosite and, therefore, find little commercial utility as a reinforcing agent. From a scientific standpoint, any tremolite particles which are fiber-form must be categorized as asbestos since all fibrous amphiboles are included in this definition.

The first indication of J-M's stand on tremolite as an asbestos mineral is included in the minutes of a meeting of Celite and Environmental personnel held on October 2, 1972 (see Attachment A). The conclusions of this meeting regarding reclassification of tremolite is summarized on page 5 and includes the following statements:

"E. M. Fenner expressed firm opinion that we haven't got a prayer concerning establishing a variance or amendment to the OSHA regulation with respect to tremolite". . . . "Furthermore, E. M. Fenner and H. M. Jackson report that amosite and crocidolite have proven causative to mesothelioma. Both these materials have a 'fibrous' nature that is similar to tremolite. The electron micrographs exhibited in a symposium of papers presented to the Canadian Institute of Mining and Metallurgy and reprinted by the Quebec Asbestos Mining Association '1958' exhibit this characteristic on pages 21-23 comparing amosite, crocidolite, and tremolite. Thus, H. M. Jackson expressed the opinion that an attack on 'fibers' delineated from tremolite would be a long-term study. Tremolite was not separately identified in the OSHA hearing, so evidence would have to be developed to disclaim tremolite functioning as an asbestos mineral. There appears to be no

CRMC-MAD-000347

0047 0245

AC 150

F. L. Pundsack

August 28, 1973

area of attack by reclassification of tremolite through mineralogical or structural definition. Any approach to disassociation will require medical evidence."

Although no Research representatives were present at this meeting, I heartily agree with the conclusions of the group.

On January 11, 1973, S. Speil, R. S. Lamar, N. B. Sheffe., and E. L. Smith were given a presentation at the New York offices of R. T. Vanderbilt of the story put together by Mr. C. S. Smith, Vanderbilt geologist, to "prove" that tremolite, especially that present in the Vanderbilt Company New York State talc, was not asbestos. Unfortunately, this presentation gave no technical evidence to support Vanderbilt's position. The photomicrographs showed that the particles of tremolite were, indeed, much shorter than chrysotile fibers and did have an aspect ratio (L/D) less than that of crocidolite and amosite used commercially. However, the L/D for many particles was definitely over 3 (the present limit established by ACGIH and accepted by OSHA) and, therefore, they would be included in the category of "fibers". Many of these particles had L/D's greater than 10.

It is conceivable that the presentation would have an impact on the layman, but assuredly not on any person having technical competence in the field of asbestos or asbestos regulation. The presentation relied heavily on layman-type definitions of a "fiber" from various encyclopedias and a list of asbestos minerals proposed by Mr. Thompson which he indicated came from THE FEDERAL REGISTER and which included tremolite and actinolite as non-fibrous varieties. This information is included as Attachment B.

In the amphibole field, amosite and crocidolite fibers have their non-fibrous counterparts with specific terminology--cummingtonite and riebeckite, respectively. Normally, anthophyllite, tremolite, and actinolite are used to include any occurrence of these amphiboles whether fibrous or non-fibrous.

At this meeting I indicated that J-M could not support technically Vanderbilt's position. Mr. Harvey stated that the Talc Producers had scheduled a meeting in early February to develop new definitions of asbestos, talc, and commercial talc which they would propose for acceptance by an ASTM Subcommittee on Paints and Pigments. Once accepted, this would serve as a springboard to foster approval by Government-regulating agencies. I pointed out that definitions for asbestos and for the term "fiber" already existed under the auspices of other ASTM groups and agreed to supply this information, as well as

CRMC-MAD-000348

0017 0246

AC 150

F. L. Pundsack

August 28, 1973

to participate in the February 5 meeting on definitions. Subsequently, I sent to Mr. Thompson copies of the definitions relating to "asbestos fiber" under ASTM D2946-71T in which fiber was defined with a L/D of 10:1 as well as the definition of fiber for textile purposes under ASTM Committee D123 in which an L/D of at least 100 was specified. These are included as Attachment C.

At the February 5 meeting none of the attendees from other talc producers concurred with the Vanderbilt proposal that tremolite was not asbestos. During the discussion I emphasized:

1. that one of the major items requiring action was to secure elimination of the ACGIH definition "talc (fibrous)-Tremolite" and the concomitant 5 fibers/cc TLV established by the ACGIH;
2. that tremolite particles could be classed as non-fibrous or fibrous depending upon the L/D ratio for each individual particle and that the thrust here should be to attempt to establish a higher L/D than the 3:1 currently accepted. Because time was of the essence, I suggested that we propose the 10:1 ratio of ASTM Designation D2946-71T;
3. that we not try to redefine asbestos to specifically exclude tremolite since assuredly this could only lead to a long-term technical and scientific debate;
4. that any presentation to the FDA or to the Bureau of Mines Symposium which had been arranged at Vanderbilt's behest should concentrate on the medical evidence regarding the difference in biological effect of tremolite and other amphibole fibers; and,
5. that we propose a single definition of commercial talc which would include all types of talc and, therefore, eliminate the need for differentiating between "pure" talc and talc (fibrous)-Tremolite as defined by the ACGIH.

In general these recommendations were adopted by the group and the following definition proposed by me was tentatively accepted for presentation to the Talc Producers Association:

"Industrial talc is a product varying in mineral composition from the mineral talc $[Mg_6(Si_8O_{20})(OH)_4]$ to mixtures of mineral talc and other naturally associated non-fibrous and/or fibrous minerals as defined by ASTM Designation D2946-71."

CRMC-MAD-000349

0017 0247

AC 150

F. L. Pundsack

August 28, 1973

Acceptance of this definition would automatically infer a change of the L/D of a fiber to 10:1 and eliminate many tremolite particles from the "fiber" category and, therefore, from the asbestos category. However, a considerable percentage of the tremolite particles would still be classed as "asbestos fiber". Although ASTM would probably accept this definition of talc, I frankly doubt whether Government agencies would.

Subsequent to this meeting, R. S. Lamar on January 31, 1973, proposed to P. A. Martinson that we issue a letter giving our position to our customers and the industry, and stating that tremolite is an asbestos mineral. I commented at length on this letter on February 14 (see Attachment D) recommending that we not send out such a letter. The major thrust of my comment was addressed to the point that tremolite can be either fibrous or non-fibrous, i.e., either asbestos or not depending on the shape of each individual particle and that we should not categorically state that all tremolite was indeed asbestos. (Incidentally, some of my much earlier comments might be interpreted as indicating that all tremolite was asbestos.)

Since that time I have had essentially no contact with the tremolite in talc situation which has been Bill Streib's responsibility. My understanding is that at the Bureau of Mines Seminar in May 1973 the J-M presentation was restricted primarily to medical aspects, differentiating between the effects of tremolite and other asbestos fibers. I also understand that the Vanderbilt presentation included the same story which was given to us in January, to "prove that tremolite was not asbestos", but possibly modified somewhat in the light of our discussions.

In July 1973 Vanderbilt through their attorneys petitioned OSHA to modify asbestos standards promulgated pursuant to the OSHA Act. This is presented in Attachment E. I am entirely in accord with their petition to replace the word "tremolite" by "asbestiform tremolite" to distinguish this from the non-fibrous (by definition) forms of tremolite. In this way non-asbestiform tremolite and talc would be subject to the "mineral dust standard" and asbestiform tremolite would continue to be subject to the "asbestos standard".

Their proposal summarized in Appendix I of Attachment E is based on the February 5 meeting previously referred to and, therefore, is entirely acceptable although personally I see no possibility of Government agencies changing the L/D definition of a fiber from 3:1 to 10:1 except by the presentation of

CRMC-MAD-000350

0017 0248

AC150

R. L. Pundsack

August 28, 1973

valid medical evidence to support such a change. Some of the work that the QAMA is supporting at Fairleigh Dickenson and the work being done by Stanton on sized fibers prepared by us might serve as the basis for requesting such a proposed change which would, undoubtedly, be opposed by Selikoff on the basis of the limited data available.

Incidentally, I have been told thirdhand that Vanderbilt secured concurrence of their original proposal to eliminate tremolite as an asbestos mineral from Governmental regulations (EPA) and that this is supported by Appendices 9 and 10 of Attachment E. A close reading of these letters from EPA indicates the presence of "weasel words" since they both include the statement "the standard is applicable, however, to paint and coatings manufacturing when asbestos as defined by 40 CFR 61.20, with the above exception, is used in the manufacturing process".

Tremolite is included as an asbestos mineral in 40 CFR 61, and even though both letters state that 40 CFR 61, National Emission Standards for Hazardous Air Pollutants, will be amended in order to properly clarify this situation, neither letter indicates that tremolite will be removed from the definition of 40 CFR 61.21. It is hard to understand how industrial talc, some of which contains 50 per cent or more of tremolite, can be specifically excluded merely by calling this material talc (containing tremolite) rather than calling it tremolite (containing talc).

A copy of the applicable portions of the National Emission Standards for Hazardous Air Pollutants for asbestos is included as Attachment F.

In the J-M "crisis" meeting on August 24, 1973, to discuss the FDA decision to issue proposed standards on food grade talc which presumably would also include talc used in paper for wrapping foods, R. P. Carter stated that he had been told by FDA middle-management personnel responsible for preparing the regulations that they were in favor of issuing an interim regulation which would continue the status quo for at least 2 to 3 years while technical and medical evidence were being accumulated to insure a fair and reasonable set of regulations. However, they had been instructed instead by their superior, the new Commissioner of FDA, to prepare proposed regulations restricting the use of talc-containing asbestiform minerals for immediate publication. Carter was told that the entire technical and medical evidence presented by J-M and other industrial petitioners was completely ignored in this decision which was motivated by political pressure from the Environmental Defense Fund and other groups.

CRMC-MAD-000351

0017 0249

AC 150

-6-

F. L. Pundsack

August 28, 1973

Finally, to complete the record, I am attaching a copy of my letter of August 9, 1971, to F. D. Richards (Attachment G) pointing out the possibility of future difficulties with FDA before we purchased Grantham Talc.



S. SPBIL

SS/rs

Attachments A through G

CRMC-MAD-000352

0017 0250

AC 150

Petition to Modify 29 CFR 1910.93
and 29 CFR 1910.93(a), Presented
to the Occupational Safety and
Health Administration by R. T.
Vanderbilt Company, Inc., and
International Talc Co., Inc.

CRMC-MAD-000353

0017 0251

PROPOSED

AMENDMENT TO 29 CFR 1910

1. Table G-3 - Mineral Dusts of Section 1910.93 is amended by deleting therefrom the references to Talc (non-asbestos-form), Talc (fibrous) and Tremolite, and by substituting therefor the following:

<u>"Substance</u>	<u>Mppcf</u>
Talc	20 ⁿ
Tremolite (non-asbestiform)	20
Tremolite (asbestiform). Use asbestos limit --"	

2. Sub-section (a) of Section 1910.93a is amended to read as follows:

"(a) Definitions. For purposes of this Section

- (1) 'Asbestos' refers to a hydrated silicate mineral, with a structure based upon silicon-oxygen tetrahedra, fitting the definition of a fiber, and composed of single crystals in predominantly parallel orientation. These minerals are chrysotile, crocidolite, amosite, anthophyllite asbestos, tremolite asbestos, and actinolite asbestos.
- (2) 'Fiber' means any material in a form such that it has a minimum length to average maximum transverse dimension of 10 to 1, a maximum cross sectional area of 7.85×10^{-5} in. (5.06×10^{-2} mm) (corresponding to a circular cross section of 0.010 in. (0.254 mm) in diameter) and a maximum transverse dimension of 0.010 in. (0.254 mm).
- (3) 'Asbestos fibers' means asbestos fibers longer than 5 micrometers."

A. M. DAVIS (1000 111)
A. M. GILBERT
JOSHUA LEVINE
PHILIP K. SCHWARTZ
PATRICIA HATRY
THEODORE A. KAUFMAN
PHILIP S. REISS
PAUL E. GIBNEY, JR.
ROSS L. GILBERT
LEONARD ORKIN
SOLOMON P. FRIEDMAN
MARTIN A. REMNITZ
GERALD B. SCHWARTZ
MILES BAUM
ALAN D. KROLL
STUART LEE FRIEDEL
MICHAEL D. DITZIAN

DAVIS, GILBERT, LEVINE & SCHWARTZ

500 FIFTH AVENUE, NEW YORK, N. Y. 10036

HOWARD P. PEGK
COUNSEL

CABLE ADDRESS
"DAVANOIL"

TELEPHONE
AREA CODE 212
664-3530

July 19, 1973

Hon. John Stender
Assistant Secretary of Labor
Occupational Safety and Health Administration
U. S. Department of Labor
Railway Labor Building
First and D Streets, N. W.
Washington, D. C. 20210

Dear Sir:

We are attorneys for R. T. Vanderbilt Company, Inc. with offices at 230 Park Avenue, New York, N.Y., and for International Talc Co., Inc. with offices at 420 Lexington Avenue, New York, N.Y. Our clients, either directly or through wholly owned subsidiaries, are miners and producers of talc.

Pursuant to 29 CFR 1911.3, we hereby petition, on behalf of our said clients, for the modification of the air contaminants and asbestos standards promulgated pursuant to the Occupational Safety and Health Act (29 U.S.C. 655).

The Petition.

Specifically, we petition for the modification of Table G-3 (Mineral Dusts) of 29 CFR 1910.93, and we further petition for the modification of 29 CFR 1910.93(a). Our particular proposals are attached hereto as Appendix 1.

The proposed amendment to the said Table G-3 would divide the reference therein to the mineral tremolite into two separate references, one being for non-asbestiform tremolite and the other being for asbestiform tremolite, and would consolidate the references therein to talc into a single reference. We propose that non-asbestiform tremolite and

CRMC-MAD-000355

0017 0253

DAVIS, GILBERT, LEVINE & SCHWARTZ

Hon. John Stender

-2-

July 19, 1973

talc be subject to the mineral dust standard, and that asbestiform tremolite continue to be subject to the asbestos standard.

The proposed amendment to Section 1910.93(a) would amend the definition of asbestos so as to include therein the asbestiform forms of tremolite, anthophyllite and actinolite, and define "fiber", all based on the definitions of the American Society for Testing and Materials (Designation: D2946-71T).

Background.

The present definition of asbestos, as contained in the asbestos standard (29 CFR 1910.93a), includes therein, as asbestos, the mineral tremolite. It appears that this inclusion was made rather loosely. For example, the criteria document (HSM 72 - 10267) of the National Institute for Occupational Safety and Health mentions tremolite only once, and then, without any scientific foundation, proceeds on the assumption that tremolite is an asbestiform mineral. Little or no attention was paid to tremolite during subsequent hearings and proceedings. Talc producers, not realizing that tremolite was being considered as an asbestiform mineral, did not participate in the hearings preceding the adoption of the asbestos standard, and thus found themselves facing a fait accompli when the asbestos standard was adopted. Tremolite is often found mixed with the pure mineral talc, and is considered to be a normal part of industrial talc. This in turn has led to industrial talc being considered under the asbestos standard as some kind of asbestos. The effect of this consideration of industrial talc as asbestos portends disastrous economic consequences, hereinafter discussed, without any firm scientific basis or resulting health benefit to justify same. We submit that the inclusion of all tremolite, within the definition of asbestos contained in the asbestos standard, is in error for mineralogical and medical reasons, and hence we are filing this petition for modification.

Mineralogy.

Enclosed herewith is a paper (Appendix 2) entitled "Discussion of the Mineralogy of Industrial Talc" by C. S. Thompson, Ph.D., together with the accompanying pictorial study.

CRMC-MAD-000356

0017 0254

DAVIS, GILBERT, LEVINE & SCHWARTZ

Hon. John Stender

-3-

July 19, 1973

Dr. Thompson demonstrates that tremolite is an asbestos mineral only in rare circumstances. His discussion of mineralogical history, examined in conjunction with his dramatic photomicrographic presentation, clearly demonstrates that if tremolite, like riebeckite, only had a different name for its fibrous form, then this petition would be entirely unnecessary. However, since the term "tremolite" covers all varieties, asbestiform and non-asbestiform, said mineral has been lumped, even in its non-asbestiform form, with the fibrous asbestiform minerals. The proposed amendment to Table G-3 will make this distinction between the asbestiform and non-asbestiform forms of tremolite, retaining the former within the strictures of the asbestos standard, while relegating the latter to the mineral dust standard where it more properly belongs. It will further remove the confusing reference to "talc fibrous", since talc is fibrous only by virtue of other minerals contained therein, which minerals should be governed by the particular standards affecting them. Said proposed amendment also will supply an accepted definition of "fiber", enabling all affected parties to know with certainty the nature of the mineralogical forms which are the subject of the standards; it will fill a glaring omission in the present standard by placing the definition in the standard itself, rather than requiring reliance on some unspecified source.

Medical Studies.

There heretofore appear to have been few authoritative writings on the fibrogenicity and carcinogenicity of industrial talcs. One of these few was by Morris Kleinfeld, M.D. Dr. Kleinfeld has now significantly furthered his study, and this was done at our clients' operations. We are submitting to you herewith "Paper Presented at the Metal and Nonmetallic Mine Health and Safety Symposium on Talc Dust Hazards on May 8, 1973" by Morris Kleinfeld, M.D. (Appendix 3), "The Biological Action of Talc and Other Silicate Minerals" by Gerrit W. H. Schepers, M.D., D.Sc. (Appendix 4) and "Experimental Studies on Biological Effects of Tremolite Talc on Hamsters" by William E. Smith, M.D. (Appendix 5). For, even leaving aside the problem of the non-fibrous nature of most tremolite, there would still remain the question as to the physical effect thereof on the health of the workers using same. But what physical evils can be shown to be caused by tremolite?

CRMC-MAD-000357

0017 0255

DAVIS, GILBERT, LEVINE & SCHWARTZ

Hon. John Stender

-4-

July 19, 1973

Crocidolite, chrysotile and amosite are often mentioned in medical literature in connection with various pathogenic responses and hypotheses, but it appears that tremolite is not so mentioned. We believe that the question has been rather definitively answered by Drs. Kleinfeld, Schepers and Smith. The qualifications of these doctors are beyond question, and their experience is vast. They are truly experts in the broad field of the effects of silicate minerals. It would be a disservice to their presentations to attempt to summarize them in any way here, and probably unnecessary. Suffice it to say that the experimental, clinical and epidemiological evidence compiled by them points inescapably to the conclusion that talc and tremolitic talcs are biologically inert, non-carcinogenic, and with little or no adverse fibrogenic effect, or effect on the heart. Given this lack of pathogenic effect, we suggest that tremolite (but, in the interests of limiting our request, only the non-fibrous form thereof) be treated as other mineral dust. We think that the materials here enclosed rather conclusively establish the basic safety of talc material. Prior studies on the subject of "asbestos" simply do not deal directly with the subject of tremolite and industrial talcs, and are not apposite to this petition. We know of no studies contrary to those presented here.

Economic Impact.

It is naturally tempting, when dealing with a subject of such importance as health, to regulate broadly on the theory that such regulation will aid in achieving the desired goal. But however lofty the motives, the more mundane subjects, such as the economic impact of such regulation, must be carefully considered, for they too have an enormous effect on the quality of life. So also, in evaluating the asbestos standard as it relates to industrial talcs, the effects thereof, not only on talc miners and millers, but also on those workers and businesses which depend on talc, and on consumers who use products made with talc, must be carefully weighed.

Tremolitic talcs make up approximately one-half of all talcs mined in the United States. Such talcs are used extensively in the paint, rubber, plastics and ceramic wall tile industries. If such talcs are to be considered as

CRMC-MAD-000358

0017 0256

AC 150

DAVIS, GILBERT, LEVINE & SCHWARTZ

Hon. John Stender

-5-

July 19, 1973

asbestos under the asbestos standard, then, as hereinafter discussed, both the paint and ceramic tile industries will have to eliminate the use of talc. With their major users thus gone, our clients will be forced out of the talc business. The local effect of this will be severe. Both of our clients have facilities in St. Lawrence County, New York. This county is an economically impacted area (see letter dated June 20, 1973 from Congressman Robert C. McEwen to Assistant Secretary of Labor John Stender, attached hereto as Appendix 6). The talc operations of our two clients employ 373 people, whose aggregate annual payroll, including fringes, amounts to almost 4 million dollars. In addition, our clients pay almost a quarter of a million dollars annually in local and state taxes. If our clients are forced to discontinue their talc operations, because of a loss of customers, then the aforesaid jobs, with the accompanying payrolls, and the taxes paid, will all simply disappear. The impact of this on any area, and especially on an impacted area, is not hard to imagine.

In addition, if our clients are forced to discontinue their talc operations, certain of their suppliers will also be hard hit. For example, our clients annually purchase over a quarter of a million dollars in products of the paper bag industry. In addition, our clients pay more than 4.7 million dollars annually to the transportation industry for transportation of talc products. These supplying industries would therefore suffer substantial damage if our clients must discontinue their talc operations. And the figures given above do not reflect the further damage which will be done when other miners of talc are forced out of operation by loss of customers.

As to the effect on the paint industry of the application of the asbestos standard to tremolitic talcs, attached hereto as Appendix 7 is a letter dated July 3, 1973 from Royal A. Brown of the National Paint & Coatings Association to Mr. Gerard Scannell, Director of the Office of Standards, Occupational Safety and Health Administration. It is apparent therefrom that the application of the asbestos standard to industrial talcs will render impossible the continued use of talc by the paint industry. The loss of the paint industry as a customer, will, in itself, require our clients to cease operations in the talc field, with all of the concomitant economic results which have been discussed above. In addition, please note that the use of a substitute material in paints "would result in higher costs to the consumer for products

CRMC-MAD-000359

8817 8257

AC 150

DAVIS, GILBERT, LEVINE & SCHWARTZ

Hon. John Stender

-6-

July 19, 1973

which could fail to provide the standard of performance of the existing coatings products". In these days of severe inflation, it is certainly clear that consumers will do without increased costs, coupled with inferior products. Yet the continued application of the asbestos standard to tremolitic talcs will, in the paint field, result in just that.

With respect to the effect on the ceramic tile industry of the application of the asbestos standard to tremolitic talcs, attached hereto as Appendix 8 is a letter dated July 18, 1973 from J. V. Fitzgerald of the Tile Council of America, Inc. to Mr. Robert Bacon of R. T. Vanderbilt Company, Inc. It would be a fair summary of Mr. Fitzgerald's statement to say that the application of the asbestos standard to the talcs used in the ceramic tile industry may very well result in the destruction of that industry. Note that twenty-five of the thirty-two ceramic tile factories in the United States depend on tremolitic talc, that they produce over 80% of the total American production of ceramic tile, of a value of over \$110 million dollars, and that these factories directly employ some 4,300 persons. The technology of that industry, coupled with the economics thereof, makes it plain that said industry cannot survive in this country if it must apply the asbestos standard to its use of tremolitic talc.

Environmental Impact.

Effectuation of the modification of the asbestos standard, here proposed, should have no adverse environmental impact. Although the Environmental Protection Administration has defined "asbestos" in the same manner as has the Occupational Safety and Health Administration, it is clear that the Environmental Protection Administration has never considered industrial talc as coming within the ambit of its asbestos regulations. For in its emission standard for manufacturing (40 CFR 61.22(c)), no mention whatsoever is made of the manufacture of ceramic wall tile, which industry, in itself, is one of the largest users of tremolitic talcs. Furthermore, in a letter dated June 13, 1973 to the counsel for the National Paint & Coatings Association (attached hereto as Appendix 9), the Environmental Protection Administration stated " * * * the

CRMC-MAD-000360

8817 8258

AC 150

DAVIS, GILBERT, LEVINE & SCHWARTZ

Hon. John Stender

-7-

July 19, 1973

standards were never intended to cover the manufacturing of paints or coatings when commercial or industrial talc is used as an ingredient." This was made even clearer by the Environmental Protection Administration in its letter of June 20, 1973 to Mr. Allen Harvey of R. T. Vanderbilt Company, Inc. (attached hereto as Exhibit 10), wherein it was stated that " * * * the asbestos standards do not apply to any manufacturing processes that use commercial or industrial talc as an ingredient * * * " (emphasis added). Said Administration consequently plans to amend its regulations to make this clear. From the foregoing, we believe it obvious that the granting of the proposed modification will not have adverse environmental impact.

Conclusion.

For all of the foregoing reasons, we submit that the inclusion of non-asbestiform tremolite in the asbestos standard is an error, which error should be corrected. Accordingly, we request that Table G-3 and the asbestos standard be amended as we have proposed in Appendix 1. Neither the safety nor the health of the American worker will be adversely affected by such amendment, which amendment will effectively preserve the jobs and livelihoods of thousands.

Very truly yours,

Paul B. Gibney, Jr.

PBGibney, Jr./rw

Enclosures:

Petition - 5 additional copies
Appendix 1 - 6 copies
Appendix 2 - 6 copies
Photomicrographic Study - 3 copies
Appendix 3 - 6 copies
Appendix 4 - 6 copies
Photos of slides accompanying
Appendix 4 - 2 copies
Appendix 5 - 6 copies
Appendix 6 - 6 copies
Appendix 7 - 6 copies
Appendix 8 - 6 copies
Appendix 9 - 6 copies
Appendix 10 - 6 copies

CRMC-MAD-000361

8817 0259

AC 150

ILLEGIBLE DOCUMENT

**THE FOLLOWING DOCUMENT(S) IS
ILLEGIBLE OR OF POOR LEGIBILITY
IN THE ORIGINAL. THIS IS THE BEST
COPY AVAILABLE.**

CRMC-MAD-000362

0017 0260

AC 150

Congress of the United States
House of Representatives
Washington, D.C. 20515

Appendix 6

June 20, 1973

Mr. John Stender
Assistant Secretary
Occupational Safety and
Health Administration
Department of Labor
14th Street and Constitution Avenue
Washington, D. C. 20210

Dear Mr. Stender:

I wish to take this opportunity to express my appreciation to Mr. Jerry Scannell of your office for giving two talc companies, which have mines and mills in the district, an opportunity to informally express their concerns about the OSHA standards pertaining to asbestos. I also wish to thank Mr. Harry Gilbert and Dr. John O'Neil who participated in this meeting.

The two companies, R. T. Vanderbilt Company, Inc. and International Talc Co., Inc. own and operate talc mines and mills located near the town of Gouverneur and employ over 300 people. These companies pay out in salaries and wages in excess of \$3 million and pay town, county and school taxes of nearly \$300 thousand. They are both substantial employers when you consider that Gouverneur is a community of approximately 4,600 people. I should also add that St. Lawrence County, in which these mines and mills are located, has been designated by the Department of Commerce as a county which is eligible for all possible federal assistance programs because of the high unemployment rate and the outmigration factor. Should these mines be forced to close, you can readily understand that it would have a serious and adverse economic effect in that area.

It is my understanding that the OSHA asbestos standards will be reopened for further consideration. Although these standards do not apply to the talc industry directly, these two

CRMC-MAD-000363

8817 8261

AC 150

Mr. John Stender
Page Two
June 29, 1973

companies have already been told by their customers, mainly paint manufacturers and ceramic tile manufacturers, that because tremolite which is found in talc has been classified as an asbestos and thereby cancer causing, they must find other sources of supply from companies which do not produce talc with tremolite in it. It is my further understanding that there is no evidence that tremolite is carcinogenic.

I can readily understand your desire to protect the health of American workers and with that position I most heartily agree. However, if the facts demonstrate that tremolite is not an asbestos and is not causally related to cancer, then I urge that OSHA expedite an order amending the asbestos standards so that this matter can be quickly resolved to the benefit of all concerned.

Again, thank you and the members of your staff for your consideration in this matter.

Sincerely yours,

Robert C. McEwen

RCM:lg

cc: R. C. Bacon, Assistant to the President
R. T. Vanderbilt Company, Inc.

P. F. McCarthy, Executive Vice-President
International Talc Co., Inc.

Paul B. Gibney, Jr., Esq. ✓
Davis, Gilbert, Levine & Schwartz

Mr. Jerry Giovaniello
Office of Congressman Jerry Pettis

CRMC-MAD-000364

0017 0262

PAINT &
COATINGS
ASSOCIATION

July 3, 1973

Appendix 7

Mr. Gerard Scannell
Director, Office of Standards
Occupational Safety and Health Administration
Room 504
Railway Labor Building
First and D Streets, N. W.
Washington, D. C. 20010

Dear Mr. Scannell:

We wish to emphasize the importance to the paint industry of industrial talc as a raw material. Some 172,000 tons of industrial talc in various grades are used annually in our industry to manufacture high quality industrial and architectural paint products. It is considered a very valuable ingredient by the paint and coatings industry.

It is our understanding that OSHA is presently attempting to clarify the confusion which exists in the definition for asbestos, Occupational Safety and Health Standards (Part 29 CFR 1910.93a). We do not believe it was the intention of OSHA to include industrial talc in regulations governing the handling and processing of asbestos. Due to a technicality in the definition for asbestos, however, most industrial talc used by our industry may be covered by the present standard.

The OSHA definition for asbestos includes "tremolite." Tremolite is an asbestos mineral only when it occurs in the fibrous form. Industrial talc as used in paint and coatings products may or may not contain tremolite; however, industrial talc supplied for this use is non-fibrous as identified by the proposed ASTM definition. This same problem resulted from the EPA definition for asbestos in their Natural Emission Standards for Hazardous Air Pollutants and was clarified at our request as indicated by the June 13, 1973 letter from EPA (enclosed).

If this problem is not cleared up, and a separate definition for industrial talc is not adopted, most paint manufacturers feel it will be necessary for them to eliminate the use of talc in paint products rather than attempt to comply with the stringent OSHA asbestos regulations. The reformulation and re-engineering to eliminate talc would be an extremely costly and time-consuming undertaking. It would result in higher costs to the consumer for products which could fail to provide the standard of performance of the existing coatings products.

1973
Stacy Island
Frederic, N. W.
Washington, D. C.
20505

Telephone
202 412 6772

CRMC-MAD-000365

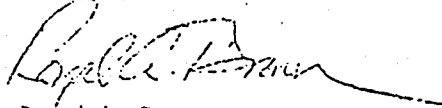
0017 0263

Page 2

Talc is used in literally hundreds of different paint products which are processed by many different types of equipment and is added in various stages of the paint manufacturing process. The complexity of talc usage by our industry would make the handling and processing of industrial talc impractical and prohibitive if the rules governing asbestos apply. We agree with the precautions and procedures required by OSHA standards for the handling and processing of asbestos. These are designed to provide health safeguards for the use of a proven hazardous material.

We believe however, that two separate definitions for asbestos and industrial talc are absolutely necessary. We respectfully urge you to consider adoption of the proposed definition for industrial talc developed by Committee D-1 of the American Society for Testing and Materials.

Sincerely,



Royal A. Brown
Director, Technical Division

RAB:seh
Enclosure

CRMC-MAD-000366

0017 0264

Tile Council of America Inc.

P.O. Box 325 • Princeton, N.J. 08540 • 609 921-7550

July 18, 1973

Mr. Robert Bacon
Talc Industry Association
R. T. Vanderbilt Co., Inc.
33 Winfield Street
East Norwalk, Connecticut 06855

Dear Mr. Bacon:

For over 25 years, the Tile Council of America has worked, through Research and Advertising, to create and expand the market for ceramic tile. At the present time, Tile Council members produce 69 percent of the 311 million square feet of ceramic tile produced annually in the United States.

To obtain a factual picture of the significance of tremolitic talc as a raw material for the tile industry, I have conferred with Chief executives of both Tile Council of America member and non-member manufacturers. Talc is used in all 32 American wall tile factories to reduce shrinkage, and thereby control the uniformity of size required in all ceramic tile. Talc also reduces moisture expansion, thereby eliminating the occurrence of cracks and crazing that would otherwise occur several years after installation. To achieve this desired dimensional stability, a tile body is composed of from 45 percent to 70 percent talc. Talc also is used to manufacture ceramic bathroom fixtures, glazes for ceramic tile and ceramic mosaic floor tile. Talc is a component of the refractories that support tiles during their manufacture.

Twenty-five of the thirty-two ceramic tile factories in this country (all of those located in United States Regional Marketing Areas numbered 1, 2, 3, 4 and 6 in the monthly Industrial Reports published by the Department of Commerce) use and depend on tremolitic talc. In March of 1973, alone, these plants are reported to have produced 17,579,000 square feet of glazed wall tile, or 84 percent of total domestic production. The factories in these five regions employ some 4,300 persons and produced 217,028,000 square feet of glazed wall tile in 1972, representing \$110,400,000.

Appendix C

John P. Arnold, III
President
Fred H. Neumann, Jr.
Vice President
J. V. Fitzgerald
Executive Director
J. E. Bennett
Research Manager

MEMBER COMPANIES

American Glaze Tile Co., Inc.
Lansdale, Pennsylvania
Aristo Ceramics Company
San Antonio, Texas
Cambridge Tile Manufacturing Co.
Cincinnati, Ohio
Continental Ceramic Corporation
Baltimore, Maryland
Florida Tile Distributors Corp.
Tampa, Florida
Gulfport Industries, Inc.
Gulfport, Texas
INTERFACE Corporation
Los Angeles, California
Kingsport Industries Tile Co.
Gettysburg, Pennsylvania
Long Star Ceramics Co.
Dallas, Texas
Marshall Tiles, Inc.
Marshall, Texas
Mid-State Tile Company
Lexington, North Carolina
Mosaic Tile, Inc.
Cleveland, Ohio
Monarch Tile Manufacturing
San Antonio, Texas
Patterson Tile Manufacturing Co.
Patterson, California
Pittsburgh-American Ceramics
Pittsburgh, Pennsylvania
Summerside Tile, Inc.
Cincinnati, Ohio
Tennessee Tile
Mineral Wells, Texas
Wenger Tile Company
Trenton, New Jersey
Wenger Tile Co. of Florida
Tampa, Florida
Windsor Tile Manufacturing
Little Rock, Arkansas

CRMC-MAD-000367

0017 0265

Mr. Robert Bacon

-2-

July 18, 1973

Ceramic tile manufacturers, therefore will be severely injured should tremolitic talc become unavailable or should they be compelled to comply, in the handling of this raw material, with the stringent new OSHA standards for asbestos and other toxic substances. Application of asbestos restrictions to tremolitic talc would cripple American manufacturers' capability of furnishing their product in the market that they have worked to create. Recognizing that this matter is critical, the Board of Directors of the Tile Council of America has requested that I assist and support the Talc Industry Association in its petition to exempt tremolitic talc from inclusion under OSHA standards for asbestos minerals and other such toxic substances.

The average after tax profit margin is 4.2 percent in the tile industry. This is so low, it is questionable that many ceramic tile factories could afford the physical changes required by imposition on the handling of tremolitic talc of the OSHA asbestos standards. This becomes obvious when the industry profits of - 1.1 percent in 1969, 2.0 percent in 1970 and 1.9 percent in 1971 are considered. Some older factories might well not afford the \$250,000 or more in capital expenditures required to comply.

The alternative - replacing this basic raw material with some other product - would also be extremely difficult and costly as to time, cost of experimentation, and possible revamping of dies and other equipment. Reserves of the talc-like mineral, pyrophyllite, which is used to manufacture some tile, are insufficient to meet demands should tremolitic talc become unavailable. Further, the value of existing inventories at both factories and distributors would be seriously affected, since exact matching of size and shade would be impossible. Finally, there is no question that the quality of the product would suffer by any such change, making it even more difficult to compete with the lower cost of foreign imports while maintaining quality standards for the domestic industry. Thus the alternative for some American manufacturers could be economically impractical and cause them to go out of business.

With these choices, one company has reported to me that, if the stringent asbestos standards are imposed on tremolitic talc, they will have to close down and build a plant in a foreign country and export to the United States. Thus, there is no question but that the domestic ceramic wall tile industry will be seriously injured if OSHA requires tremolitic talc to be classified and handled as a toxic asbestos mineral.

Sincerely yours,

J. V. Fitzgerald

J. V. Fitzgerald

JVF:nk

cc: J. Bruce
R. Gibney

CRMC-MAD-000368

0017 0266

WASHINGTON, D.C. 20460

Appendix 9

13 JUN 1973

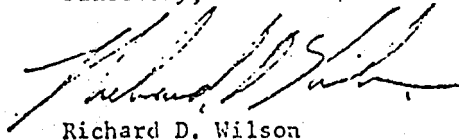
Mr. Larry Thomas
Counsel
National Paints and Coatings Assoc.
1550 Rhode Island Avenue, NW
Washington, D. C. 20005

Dear Mr. Thomas:

This letter is in response to your inquiry as to the applicability of the national emission standards for the hazardous air pollutant of asbestos to the paints and coatings manufacturing industries that use talc. It has been determined that the standards were never intended to cover the manufacturing of paints or coatings when commercial or industrial talc is used as an ingredient. The standard is applicable, however, to paint and coatings manufacturing when asbestos as defined by 40 CFR 61.21, with the above exception, is used in the manufacturing process.

It should be noted that 40 CFR 61, National Emission Standards for Hazardous Air Pollutants, will be amended in order to properly clarify this situation.

Sincerely,



Richard D. Wilson
Director, Division of Stationary
Source Enforcement

CRMC-MAD-000369

8817 0267



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

20 JUN 1973

Mr. Allen Harvey
Patent and Legal Department
R. T. Vanderbilt Co., Inc.
33 Winfield Street
East Norwalk, Conn. 06855

Dear Mr. Harvey:

This letter is in response to your inquiry as to the applicability of the asbestos hazardous air pollutant standard to talc milling operations.

The proposed National Emission Standards for Hazardous Air Pollutants (NESHAPS) defined asbestos mill as a facility engaged in the conversion of asbestos ore into commercial asbestos. Since it has been determined that talc milling does not fit this definition, the asbestos standards do not apply to this operation. In addition, it has been determined that the asbestos standards do not apply to any manufacturing processes that use commercial or industrial talc as an ingredient (unless asbestos as defined by 40 CFR 61.21, with the above exception, is used in the process).

It should be noted that 40 CFR 61, NESHAPS, will be amended in order to properly clarify this situation.

Sincerely,

A handwritten signature in dark ink, appearing to read "R. D. Wilson".

Richard D. Wilson
Director, Division of Stationary
Source Enforcement

CRMC-MAD-000370

0017 0268

D

4

Greenwood Plaza - 3 West
February 14, 1973

P. A. Martinson - 2 West

TALC PRODUCER'S ASSOCIATION (PROPOSED)
R. S. Lamar's letter of January 31, 1973

Dick Lamar's letter suggested that I comment on the technical soundness of the letter before it is sent. Before doing so, I would like to raise a question as to the desirability of sending such a letter out after attending the recent meeting of the Talc Producer's Association in New York City. While the intent of the meeting was to promulgate a series of definitions differentiating asbestos, tremolite, talc and commercial talc, I believe I was instrumental in changing the end result so that only one definition is being proposed, i.e., industrial talc.

While the exact wording may differ very slightly from the definition below, the general gist was as follows:

"Industrial talc is a product varying in mineral composition from the mineral talc $[Mg_3(Si_2O_5)_2(OH)_4]$ to mixtures of mineral talc and other naturally associated non-fibrous and/or fibrous minerals as defined by ASTM Designation D2946-71.

While we should clear with the Vanderbilt people whether they intend to continue their previous plan to convince Government officials that tremolite is not an asbestos mineral, my own impression from the meeting is that they are convinced of the futility of this approach. The much more reasonable approach, and one which has some slight possibility of bearing fruit, is to concentrate on the definition of fiber. The ASTM definition referred to above uses an aspect ratio of 10:1 rather than the ACGIH ratio of 3:1.

R. T. Vanderbilt appears to be the spearhead for the whole effort to disassociate tremolite from the list of asbestos minerals. If they are not going to push this approach, then there is little need, in my opinion, for sending the letter to Talc Producers or to the Talc Producer's Association.

So much for the political aspects of the letter. With reference to the technical aspects, I should like to make the following points, some of which obviously will be minor.

CRMC-MAD-000371

0017 0270

February 14, 1973

Page 2

P. A. Martinson - 2 West

Item 2. While tremolite does have a fibrous "crystal habit" the particles can be fibrous or non-fibrous. In essence, a fiber is a particle with a defined minimum ratio of length to width. Unfortunately, this aspect ratio (L/D) is not a definitely established limit. As a matter of fact, in the ASTM definitions there are two ratios given as minimum. In the ASTM definition of asbestos minerals, the ratio is 10:1; in the Textile Fiber section, the limit is given as 100:1.

However, the more important aspect ratio limit, whether it has any more scientific significance or not, is that promulgated by the ACGIH, namely, an aspect ratio of 3. If the tremolite particles have an aspect ratio greater than 3:1, they are fibrous as far as OSHA is concerned. If the ratio is less than 3:1, the tremolite particle is a particle, not a fiber. Thus, although "tremolite is a fibrous mineral" as stated in Item 2, the individual particles may be fibrous or may not be fibrous, depending on their specific aspect ratios.

Starting with this distinction, we go to Item 1 which says that tremolite is clearly a member of the "asbestos family" of minerals. Again, this is correct, but since the asbestos minerals are fibrous by definition, then we could conclude that those particles of tremolite whose aspect ratio is extremely small are really not fibers and, therefore, they could be considered as not being asbestos.

What I am trying to point out is that whether tremolite is to be classed as an asbestos mineral is secondary to whether the particles are really fibrous or not insofar as the OSHA regulations are concerned, and we should try to pin our arguments on the aspect ratio factor.

Item 3. X-ray diffraction methods make possible a positive "differentiation between" both minerals. It will not definitely identify tremolite in a mixture containing small quantities of tremolite in a large concentration of talc. Strongest identifying X-ray lines for tremolite are essentially the same as those for anthophyllite and several other amphibole minerals.

The statement that pure talc mineral is fairly common in nature is something that I must defer to R. Lamar's knowledge. I had not anticipated that there were any large deposits of pure talc mineral without concomitant impurities, albeit non-fibrous impurities such as carbonates, oxides, etc.

CRMC-MAD-000372

0017 0271

February 14, 1973

Page 3

P. A. Martinson - 2 West

Item 8. While I am sure that our Industrial Hygienists can supply information regarding correct procedures for dust control and other protective measures that may be required, it will be a long time before sufficient medical or epidemiological data are available on which to pass any recommendations other than to include tremolite as either an asbestos fiber, in which case the fiber count limitations will be paramount, or as a nuisance dust in which particle count would be paramount.

Dick Lamar is to be congratulated on preparing a summation of this type which brings together at one point pertinent information of a technical nature.

S. SPEIL

SS/rs

cc:

W. L. VanDerbeek	- 2 West
J. M. Sharratt	- 2 West
H. R. Keefe	- 2 West
W. C. Streib	- 3 West
R. P. Carter	- 5 West
R. S. Lamar	- 1 North
E. B. Smith	- Long Beach, Carson
R. F. Bassett	- Long Beach, Carson

CRMC-MAD-000373

0017 0272

January 25, 1973

F. J. Solon, Jr.
H. M. Jackson
E. M. Fenner
W. B. Reitze
Dr. G. Wright
Dr. S. Speil ✓
Dr. J. Leineweber
Dr. E. Marriner
R. P. Carter
W. L. VanDerbeek
P. A. Martinson
H. R. Keefe
R. S. Lamar
N. B. Scheffel
E. B. Smith

R. T. VANDERBILT ACTIVITIES FDA-OSHA REGULATIONS

On January 11 as arranged by Norman B. Scheffel, a meeting was held at the R. T. Vanderbilt New York offices to observe a presentation of the field by RTV to Government agencies concerning talc vs. asbestos. In attendance were Dr. Speil, R. S. Lamar, N. B. Scheffel, and E. B. Smith.

The presentation consisted of a series of slides as photomicrographs comparing Vanderbilt New York State talc (Nytal 100, 200, 300, 400), California talcs (Westal 101, 303, and 404), and beneficiated California talcs. Compared also were slides of asbestos minerals. In this presentation, it is the objective of Vanderbilt to establish that tremolite is non-fibrous and non-asbestiform in order to obtain an amendment or variance in the OSHA regulations to exclude tremolite. The presentation did contrast the particle shape of their talc mineral as compared to asbestos fibers but lacked any real scientific evidence to differentiate current definitions.

Vanderbilt has made this presentation to the New York State Bureau of Mines attended by Dr. Jacquelin Messite, Merley, Sheffield, and Stein. Kleinfeld not present due to his retirement. Vanderbilt has also made this presentation to Earl Goodwin at the U. S. Bureau of Mines. They have also made these presentations to EPA at Durham attended by Mr. Arthur Stevens, Deputy Director of the Bureau of Mines and Safety. Vanderbilt feels that they have cast some doubt on the definition and are hopeful to pursue Government agency toward a new definition of "commercial asbestos" as opposed to tremolite as an asbestos mineral. Vanderbilt has also been in communication with the A.S.T.M. Committee D-1-31-07 concerning extender pigment. Presentation made by Allan Harvey at Miami was oriented towards the removal of tremolite from the asbestos definition. It is their hope to obtain A.S.T.M. approval and use this approval with other Government agencies.

Vanderbilt has justifiably been reluctant to tackle NIOSH until more confidence is developed in their presentation. Dr. Speil was of considerable help at this meeting in pointing out the pitfalls and errors in Vanderbilt's thinking. It was concluded that the attack on tremolite vs. chrysotile must be medically oriented as opposed to a simple fiber definition or redefinition. Speil suggested that a more appropriate approach would be to obtain an exclusion

CRMC-MAD-000374

0017 0274

AC 150

of tremolite based on scientific or medical reasons as opposed to a redefinition separating tremolite from chrysotile and/or asbestos. However, Vanderbilt intends to pursue the subject by enlisting the Talc Industry Association's help in developing an acceptable definition of talc, asbestos, etc. at the meeting scheduled for February 5 in New York. In view of the expertise obtained by J-M people in this mineralogical area and the Government communications area, we urge that Dr. Speil and additional environmental people at J-M attend the February 5 meeting in New York.

Attached to this memo are some definitions that Bob Bacon has extracted from various encyclopedias and from the Federal Register concerning asbestos fibers. It is in this direction that RTV intends to proceed. We certainly question this attack and increased help from J-M to guide this program properly and scientifically and not to the detriment of the talc industry.

Earl B. Smith

EBS:cks

CRMC-MAD-000375

0017 0275

AC 150

C

7

January 22, 1973

Dr. C. S. Thompson
R. T. Vanderbilt Company, Inc.
33 Winfield Street
East Norwalk, Connecticut 06855

Dear Dr. Thompson:

I am sorry to have delayed so long in sending you samples of the UICC fiber, but we could not locate our own samples nor descriptive material on the fibers because of our move currently underway.

I am enclosing two small plastic envelopes--one containing UICC crocidolite, and the other UICC anthophyllite. You will note that these are comparatively short fibers, but possibly not as short as the tremolite in your talc. In any case, the UICC crocidolite has caused carcinoma in animals, although I do not know of any specific results from animal experiments with the anthophyllite.

I am also enclosing copies from the 1972 ASTM Yearbook. On page 593 are listed tentative definitions of terms relating to asbestos fiber. These are under the jurisdiction of ASTM Committee D-30 on High-Modulus Fibers. The definitions on this page are specifically related to asbestos.

On page 20 are a series of other definitions relating to the word fiber under the auspices of ASTM Committee D-123. These are related to the use of fibrous materials in textile products. You will notice the difference between the definitions. When referring to asbestos, the fiber definition calls for a 10:1 ratio in length to average maximum transverse dimension. When related to weavable fibers, the corresponding ratio is 100 times. These specifications are already in the ASTM literature.

While I appreciate the intention of our Talc Producers Committee to get a still different definition into the ASTM literature through the pigment subcommittee, such a

CRMC-MAD-000376

0017 0278

AC 150

January 22, 1973
Page 2

Dr. C. S. Thompson
R. T. Vanderbilt Company

definition would probably still be related to the application involved, that is, pigments and would have no more standing with the Government than the two definitions already in the literature. In fact, the ACCIR has established their own definition, as you know, based on what they consider to be the properties of a fiber related to their own particular field, that is, health effects.

I will be glad to discuss this with you in more detail, and am trying to get still other definitions of fiber which have been recognized either commercially or by health regulatory groups before the meeting on February 5.

Sincerely,

Dr. Sidney Spoil, Director
Central Research Department

Enclosures (3)

bcc:

E. B. Smith - Desert Minerals
N. Scheffel - Desert Minerals
R. S. Lamar - 1 North, Denver

CRMC-MAD-000377

0011 0279

AC 150



Johns-Manville
Products Corporation

Filtration & Minerals Division

Greenwood Plaza
Denver, Colorado 80217
(303) 770-1000

April 18, 1975

Mr. H. B. Vanderbilt, President
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, CT 06855

Dear Mr. Vanderbilt:

Your courtesy in meeting with us earlier this week is greatly appreciated. We felt that it was important for you to understand our position with respect to talc labeling and the various actions we are currently taking in the market place in this regard.

Our intent in sharing with you our analytical data on your products is an attempt to be helpful and is most certainly friendly. In this regard, if we can in any way be of assistance to your technical people through an exchange of information and samples we would be glad to do so. If Dr. Thompson would care to meet with our Research people to review our findings we would be pleased to arrange this for him. This kind of technical exchange would be helpful to both companies.

Following our meeting in Norwalk, I have reviewed with Dr. Paul Kotin, Medical Director for Johns-Manville Corp., the various points we discussed. He has indicated that if you so desire he would gladly meet with you and various members of your staff to describe the medical aspects of the situation.

Will you please convey my thanks to the other members of your group who attended our meeting on April 16.

Sincerely,

R. S. Lamar, Manager
Filtration and Minerals Division
Growth Development

dla

cc: Dr. Paul Kotin
Dr. Fred Pundsack



bcc:
S. W. Schulmeyer
H. R. Keefe
RSL chrono
file P. T. Vanderbilt
file
C. J. Sulewski
P. A. Martinson
R. P. Carter
W. C. Streib

CRMC-MAD-000378

0011 0338

AC 150



Johns-Manville

Internal Correspondence

To: MEMO TO FILE

Date: Nov. 13, 1973

From: R. P. Carter

Copies: File & C

Subject RE: MEETING WITH JOHN O'NEILL - NOVEMBER 8, 1973
MEETING WITH JERRY SCANNELL AND JOHN O'NEILL - NOV. 9, 1973

Several weeks ago, upon learning that John Stender had decided not to appoint a Standards Advisory Committee in connection with the reopening of the asbestos standard, I called Jerry Scannell's office for the purpose of setting up a meeting with Jerry to determine why this decision had been made and what Johns-Manville and the asbestos industry could do to assist OSHA in promulgating a new standard. Jerry Scannell was out of town on business in Hawaii for a period of three weeks and therefore, the meeting could not be set up until November 9.

After a meeting was scheduled with Jerry Scannell for November 9, I was advised that John O'Neill would be delivering a presentation to the annual meeting of the A/C Pipe Producers Association in Washington on November 8. I attended that meeting and had the opportunity to informally speak with John O'Neill in addition to listening to his presentation.

During our informal conversation, John O'Neill indicated that one of the primary reasons for Stender's decision against the establishment of a Standards Advisory Committee was due to the fact that if such a committee was appointed, Dr. Irving J. Selikoff would have to be included as a member of the committee. I got the impression from O'Neill that Stender felt that Selikoff's presence on the committee would impair the functioning of the committee. O'Neill further indicated to me that the thrust of the revision would be the establishment of work practices. I indicated to John that it could conceivably take several years to prepare work practices for each segment of the asbestos industry. John agreed, but indicated that they would attempt to prepare work practices by processes which were common in each segment of the industry. During our informal discussion, John O'Neill mentioned that he had read the first two installments of Paul Brodeur's series of articles in the New Yorker Magazine. John was not happy

CRMC-MAD-000379

MEMO TO FILE
Page 2
November 13, 1973

with these articles as it presented a very one-sided picture of the asbestos industry and was concerned with several unfavorable comments made about certain government employees. During his presentation, John O'Neill made specific reference to the unfair treatment of the asbestos industry in the news media and how only one side of the story was being told, which in his opinion, was quite unfair.

During his presentation before the A/C Pipe Producers Association, John O'Neill was quite candid in his remarks regarding the reopening. I did not get the impression that John O'Neill was speaking from any prepared notes but was rather making off-the-cuff remarks. The key points covered by John O'Neill in his presentation were as follows:

- (1) The OSHA standard for exposure to asbestos dust was written only to prevent asbestosis and was not designed to prevent mesothelioma or cancer.
- (2) The new evidence which OSHA now has is that fibers other than asbestos can cause mesothelioma.
- (3) The British data upon which the current OSHA standard was based is weak and not scientific.
- (4) OSHA wants to re-evaluate the TLV for asbestos.
- (5) When preparing the current asbestos standard, OSHA did not take into consideration the talc mining problem. He indicated that tremolite is not fibrous and it has not been proven that tremolite causes any harm. OSHA therefore, must re-examine the types of asbestos covered. (During this past Summer, R. T. Vanderbilt and Company, a major talc producer, filed a petition with OSHA requesting a modification of the asbestos standard, basically deleting tremolite from the standard.)
- (6) The method of sampling and measurement must be re-examined. In a phase contrast system, it is difficult to differentiate and distinguish fibers.
- (7) The types of respirators permissible must be re-examined. As of April 1, 1974, many respirators will lose their current approval.

CRMC-MAD-000380

MEMO TO FILE
Page 3
November 13, 1973

- (8) OSHA wants to re-examine monitoring.
- (9) Work practices must be developed, evaluated and made mandatory.
- (10) Asbestos is essential in many uses and OSHA has no intent to ban its use. Rather, OSHA is desirous of establishing safe ways of using asbestos.
- (11) John Stender has opted for the use of outside consultants in lieu of appointing a Standards Advisory Committee.
- (12) OSHA wants the new standards to be very clear. One of the strong reasons for reopening the standard is due to a large number of inquiries OSHA has received during the past year and a half for clarifications and interpretations of the standard. It is their conclusion based on the volume of requests that the current standard is not clear.
- (13) The current numerical standard will probably remain unchanged.
- (14) OSHA would like considerable input from industry to assist them in drafting a new standard.

On November 9, Jack Solon and I met with Jerry Scannell at his office. When we arrived, John O'Neill was also present in Jerry Scannell's office. Jerry indicated that he was currently in the process of preparing a written proposal to John Stender which would consist of a procedure to draft and promulgate a revised asbestos standard. This proposal would be in lieu of the establishment of a Standards Advisory Committee, in view of the fact that Stender had rejected the establishment of such a committee. Jerry's recommendation to Stender will be for OSHA to prepare a draft of a new asbestos standard which would take at least three to four months. Then OSHA would use outside consultants, individuals picked from industry and labor, to be used by OSHA on an individual basis. For example, Scannell would propose contacting AIA to receive recommendations for individuals to be used as consultants. At individual meetings with these consultants, OSHA would discuss particular portions of the proposed revisions with experts in specific areas. After OSHA has met with these consultants they would then arrange to visit various plants in the asbestos industry to determine the practicality of the revised standard. Jerry Scannell indicated that he had

CRMC-MAD-000381

MEMO TO FILE

Page 4

November 13, 1973

received a ruling from their attorneys to the effect that such a plant visit could not be the basis for an OSHA citation. Jerry was quite concerned that various companies might object to OSHA's presence in a plant due to a possible citation exposure. Jerry would like every effort to be made by OSHA to insure their credibility with industry that citations would not be issued as a result of these plant visits. As a matter of fact, he would attempt to work out an arrangement with OSHA enforcement people so that no plant inspections would be made in those establishments visited for a period of at least one year after their plant visit. Following the plant visits, OSHA might perhaps meet on a group basis with all of the consultants for the purpose of reviewing a final draft of the proposed regulations. During the entire process, the proposed regulations would be revised and altered informally as necessary. The final step would be the publication of a new proposed standard in the Federal Register, which probably would not take place before a period of one year from now. At the time the new proposed regulations are published, OSHA might announce a hearing date at that time if they feel there will be substantial comments or objections to the proposal. Jerry indicated it was conceivable that if no meaningful objections were made to the proposal, no hearing at all might be scheduled.

Towards the conclusion of our meeting, Jerry Scannell indicated that there were several things he would like from J-M:

- (1) A letter on how we would like the asbestos standard modified. For example, what aspects of the standard are currently unclear or impractical.
- (2) Provide OSHA with suggestions for improving monitoring and fiber counts, perhaps including a proposal for scrapping fiber counts.
- (3) How can OSHA get Labor and Management together to discuss a new proposed standard without such a meeting being conducted on an adversary basis.
- (4) After Ed Fenner establishes a Technical Committee within AIA, Ed Fenner should contact John O'Neill to discuss whatever assistance the Technical Committee can give him in drafting a new standard.

CRMC-MAD-000382

MEMO TO FILE
Page 5
November 13, 1973

- (5) Jerry Scannell may need assistance from J-M and other companies in the industry in selling his new proposal to John Stender. In view of the fact that J-M and other companies have sent letters to Stender advocating the establishment of a Standards Advisory Committee, it might be desirable at some point in time for us to advise Stender that we support Jerry Scannell's new proposal. In this regard, it is my intention to contact Jerry Scannell at the earliest possible time to advise him that J-M fully supports his new proposal to Stender and advise him that we would like to cooperate in any way possible to assist him in selling his proposal to Stender. I will suggest to Jerry that he give consideration to arranging a meeting for J-M with Stender, at which time he should be present, for us to convey our support of his proposal to Stender. The timing of such a meeting should be left to Scannell.



R. P. Carter

P.S. - After dictating this memo, I spoke with Jerry Scannell by telephone at which time he advised me that he had presented his proposal to Stender and Stender had accepted his suggestions. I then asked Jerry if we should either write or call Stender for a meeting to indicate our support of their new proposal. Jerry said the decision was up to us but we should either call for a meeting or present our views in a letter to Stender. It is my present plan to draft a letter to Stender withdrawing our request for the establishment of a 15-man Advisory Committee and supporting Scannell's proposal. I intend to read a draft of this letter to Scannell over the telephone and ask his suggestion as to whether or not the letter should be sent or a personal meeting arranged.

CRMC-MAD-000383

October 9, 1974

Mr. H. B. Vanderbilt
President
Chief Executive Officer
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 06855

Dear Mr. Vanderbilt:

This is in reply to your letter of September 26, concerning your request for relief from the asbestos standard for your talcs containing non-fibrous tremolite, actinolite, and anthophyllite.

My letter of August 6 stated that non-fibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the asbestos standard and, therefore, the provisions of that standard do not apply to talc containing non-asbestiform minerals.

NIOSH is currently conducting a thorough investigation into the exact minerals to which talc workers were exposed in those studies where asbestosis or other adverse medical effects were found.

Pending the receipt and evaluation by OSHA of the report by NIOSH on this investigation, if you have scientific evidence that the naturally occurring talcs, prior to processing by milling or crushing, do not contain fibrous or asbestiform tremolite, anthophyllite, actinolite or other asbestiform minerals, you may certify to your customers that the talc does not contain asbestos.

Fibrous, asbestiform minerals such as fibrous tremolite means naturally occurring asbestiform minerals which prior to or after crushing and processing, contain fibers made up of fibrils.

Sincerely,

/s/ John R. Stender

John R. Stender
Assistant Secretary of Labor

C 15656

CRMC-MAD-000384

C O P Y

October 9, 1974

Mr. H. B. Vanderbilt
President
Chief Executive Officer
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 08855

Dear Mr. Vanderbilt:

of 1

This is in reply to your letter of September 26, concerning your request for relief from the asbestos standard for your talcs containing non-fibrous tremolite, actinolite, and anthophyllite.

My letter of August 6 stated that non-fibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the asbestos standard and, therefore, the provisions of that standard do not apply to talc containing non-asbestiform minerals.

NIOSH is currently conducting a thorough investigation into the exact minerals to which talc workers were exposed in those studies where asbestosis or other adverse medical effects were found.

Pending the receipt and evaluation by OSHA of the report by NIOSH on this investigation, if you have scientific evidence that the naturally occurring talcs, prior to processing by milling or crushing, do not contain fibrous or asbestiform tremolite, anthophyllite, actinolite or other asbestiform minerals, you may certify to your customers that the talc does not contain asbestos.

Fibrous, asbestiform minerals such as fibrous tremolite means naturally occurring asbestiform minerals which prior to or after crushing and processing, contain fibers made up of fibrils.

Sincerely,

/s/ John H. Stender

John H. Stender
Assistant Secretary of Labor

CRMC-MAD-000385

~~100-3000~~ : F107-569

October 9, 1974

Mr. W. E. Vanderbilt
President
Chief Executive Officer
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 08855

Dear Mr. Vanderbilt:

This is in reply to your letter of September 26, concerning your request for relief from the asbestos standard for your talcs containing non-fibrous tremolite, actinolite, and anthophyllite.

My letter of August 6 stated that non-fibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the asbestos standard and, therefore, the provisions of that standard do not apply to talc containing non-asbestiform minerals.

NIOSH is currently conducting a thorough investigation into the exact minerals to which talc workers were exposed in those studies where asbestosis or other adverse medical effects were found.

Pending the receipt and evaluation by OSHA of the report by NIOSH on this investigation, if you have scientific evidence that the naturally occurring talcs, prior to processing by milling or crushing, do not contain fibrous or asbestiform tremolite, antophyllite, actinolite or other asbestiform minerals, you may certify to your customers that the talc does not contain asbestos.

Fibrous, asbestiform minerals such as fibrous tremolite means naturally occurring asbestiform minerals which prior to or after crushing and processing, contain fibers made up of fibrils.

Sincerely,

/s/ John H. Stender

John H. Stender
Assistant Secretary of Labor

CRMC-MAD-000386

B 26771



Johns-Manville
Products Corporation

Cellite Division

Greenwood Plaza
Denver, Colorado 80217
(303) 770-1000

August 27, 1973

Mr. Robert H. McCarthy, President
International Talc Company, Inc.
420 Lexington Avenue
New York, N.Y. 10017

Dear Mr. McCarthy:

Confirming our phone conversation Friday morning, I am enclosing a copy of "Food Grade Talc Specifications to be Proposed by FDA" as published in Food Chemical News, August 20, 1973.

Although the article and the reported regulation forthcoming from FDA is pointed toward asbestos, there is by association regulatory aspects that directly affect talc containing asbesto-form fibers.

As a matter of information there has been or will be shortly, communications between J-M counsel and Mr. Robert Bacon of R.T. Vanderbilt relative to the subject.

It appears to the writer that to those of us directly concerned with talc processing and marketing there is justification for questioning issuance of the regulation in question. There appears to be little or no supporting scientific data as a basis to issuing the regulation.

The enclosed is sent along for information only.

Sincerely,

P.A. Martinson
Vice President
General Manager

cc:
W.L. VanDerbeek - 2W
J.L. Solon - 4N
R.P. Carter - 4N
W.B. Reitze - 1S
G.E. Parker - 5W
S. Speil - R&D
R.S. Lamar - R&D
R.F. Bassett - LB
H.R. Keefe - 2W

D

CRMC-MAD-000387

uBZ

Legal Services
Denver - GHQ
April 23, 1973

F. J. Solon
E. M. Fenner
Dr. G. Wright
S. Speil
J. Leineweber
Dr. E. Marriner
W. B. Reitze - IS ←
P. A. Martinson
H. R. Keefe
W. C. Streib
R. S. Lamar
G. Coombs
N. B. Scheffel
E. B. Smith
W. L. VanDerbeek

FDA PROPOSED TALC REGULATIONS

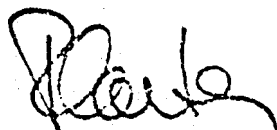
Enclosed is the final version of J-M's comments and exhibits regarding the FDA's proposed regulations banning the use of talc in food and food packaging materials. The letter with our comments and the attached exhibits was mailed to FDA this morning.

The final version of our comments contains many modifications and additions from the last draft circulated on April 6. I am presently planning to contact Allen Spiher of FDA to set up a meeting with him in the near future to review our comments with FDA and to get an indication as to the direction in which they are proceeding on this matter.

Also enclosed is a copy of R. T. Vanderbilt's comments to FDA which I received today. Of most significant interest is Appendix C to their comments, which is a copy of a letter from Dr. Schepers to Bob Bacon, Director of Research for Vanderbilt. I would appreciate receiving comments concerning our use of the information contained in Dr. Schepers' letter in our presentation at the Bureau of Mines Talc Symposium in Washington on May 8.

Additionally, I have enclosed a copy of a letter dated March 2, 1973 from Dr. Alfred Weissler of FDA to the Environmental Defense Fund in response to their inquiry about asbestos

in talc. Dave Malino of The Government Research Company forwarded a copy of this letter to me. The last paragraph on page 2 is of interest in that FDA indicates, much to my surprise, that they have undertaken extensive literature surveys on the carcinogenicity of asbestos and of talc. This was a total surprise to me as I found FDA to be totally unknowledgeable regarding the question of carcinogenicity of asbestos and talc when I met with them last September. Perhaps, they were embarassed as to their lack of knowledge at that time and have now attempted to educate themselves. Again, if any of you have any comments relating to the contents of this letter from Dr. Weissler, I would appreciate hearing from you.



Richard Carter

enclosures

CRMC-MAD-000389

R. T. VANDERBILT COMPANY, INC.
33 WINFIELD STREET
EAST NORWALK, CONNECTICUT 06857

April 17, 1973

CABLE ADDRESS
BILTVAN NEW YORK

Mr. Alan T. Spiher, Jr.
Chief, GRAS Review Branch
Division of Petitions Processing
Bureau of Foods
200 C Street, S. W.
Washington, D. C. 20204

Dear Mr. Spiher:

We are sending you the attached documents pertaining to the "Proposal Regarding Regulation of Prior-Sanctioned Food Ingredients" (37 F.R. 16407) at the request of Dr. Corbin Myles, with whom we have been in telephone contact regarding our petition for an extension of time for comment.

We sincerely appreciate the opportunity to elaborate on the question of possible health hazards of industrial talcs. It is important that the true medical and mineralogical facts of the situation be known and well understood.

In the discussion preceding the proposed talc amendment it is stated that it is prudent to require that talc which is to be used in the manufacture of food and food packaging be free of "asbestos-form particles". Certain medical reasons for this judgment are given. Our studies of talc have shown that great care must be taken to define the term "asbestos-form particle" in order to avoid a prejudicial attitude toward the majority of the industrial talcs sold today, especially when so little evidence of physiological harm has been exhibited.

It is true that no firm mineralogic definition of commercial talc exists today, but the majority of talcs that are useful in food packaging materials consist essentially of the two minerals, talc and tremolite. Talc mines almost always contain a wide variety of silicate minerals, some of which are considered asbestos, as defined in the discussion to follow. When true asbestos minerals are present, it is often possible to selectively mine the talc portion of the orebody without extracting the asbestos minerals, and this is being done. The tremolitic talcs used in food packaging materials can be considered to be truly free of fibrous particles, and therefore, by inference, free of hazard in the particular context under discussion.

What has confused the issue, both here and in the reasoning behind regulations promulgated by other government departments, is the peculiar placement of the mineral tremolite in the category of asbestos. Unfortunately, tremolite has been portrayed as a fibrous mineral more as a result of its similarity in chemical composition to true asbestos minerals than because of any similarity in physical form. A study of the attached set of photomicrographs and a consideration of the following interpretation of asbestos mineralogy will prove that tremolite should not be categorized as asbestos without some sort of qualification such as "tremolite asbestos" or "fibrous tremolite", with the true meaning of "fibrous" and "asbestos" properly defined.

CRMC-MAD-000390

Mr. Alan T. Spiher, Jr.

- 2 -

April 17, 1973

Asbestos is a non-scientific, commercial term normally restricted in use to the long, threadlike fibrous varieties of several hydrated silicate minerals, whose fibers can be separated mechanically and pressed, spun, or woven into articles of all types that are resistant to heat and chemical action. Although present usage is generally limited to the commercially available silicate minerals, chrysotile, crocidolite, amosite and fibrous anthophyllite, other minerals regardless of chemical composition, which possess similar qualities of great elongation, flexibility, high tensile strength, heat and chemical resistance, spinnability, etc. could properly be classified as asbestos. The asbestos minerals mentioned above all have non-asbestos counterparts of the same chemical composition and crystal structure which are far more abundant and widespread than the asbestos counterpart and occur as common rock-forming mineral constituents of many igneous and metamorphic rocks (see Table I). The crystallization of these minerals in fibrous form is a rare occurrence in nature dependent upon combinations of unusual physical and chemical conditions during the metamorphism of pre-existing non-asbestiform minerals. As shown in Table I, the asbestiform varieties of the serpentine and amphibole mineral groups have, in part, been given individual names which, in themselves, imply their fibrous nature. In the case of the three amphiboles, anthophyllite, and tremolite and actinolite which occur so rarely in fibrous form (all three account for an estimated 1% of the total asbestos production), no special name was given to the asbestiform variety, and therefore, a qualifying mineralogical term such as anthophyllite asbestos, tremolite asbestos and actinolite asbestos must be used when referring to that particular crystal form.

TABLE I

"ASBESTOS " MINERALS AS LISTED IN FEDERAL REGISTER

<u>Asbestos or Fibrous Variety</u>	<u>Chemical Composition</u>	<u>Non-Asbestos or Non-Fibrous Variety</u>
Chrysotile	$Mg_3(Si_2O_5)(OH)_4$	Antigorite, Lizardite
Crocidolite	$Na_2Fe_3Fe_2(Si_3O_{22})(OH)_2$	Riebeckite
Amosite	$(Mg, Fe)_7(Si_8O_{22})(OH)_2$	Cummingtonite
()	$(Mg, Fe)_7(Si_8O_{22})(OH, F)_2$	Anthophyllite
()	$Ca_2Mg_5(Si_8O_{22})(OH, F)_2$	Tremolite
()	$Ca_2(Mg, Fe)_5(Si_8O_{22})(OH, F)_2$	Actinolite

It is this lack of a special name in the mineralogical and other literature, which caused, incorrectly, the inclusion of all forms of anthophyllite, tremolite, and actinolite in the Asbestos Dust Standard (Title 29, CFR Part 1910.93a, instead of only the asbestiform varieties, as was undoubtedly intended by the formulators of the regulation. It is obvious from the studious omission of the

Mr. Alan T. Spiher, Jr.

- 3 -

April 17, 1973

non-fibrous varieties of the other asbestos minerals, i.e. antigorite, riebeckite and cummingtonite from the asbestos standard, that if special names had existed for the fibrous varieties of the remaining amphiboles, they would have been included as well, and anthophyllite, tremolite and actinolite would also have been omitted. This distinction between the fibrous and non-fibrous forms of serpentine and the amphiboles under discussion, is substantiated by the references cited in Appendix A-1.

The accompanying set of photomicrographs (Appendix A-2) illustrates conclusively the inaccurate placement of the mineral tremolite per se in the category of asbestos. It would make as much sense to include the minerals riebeckite and cummingtonite in the category of asbestos, since the shape and distribution of their crystal shapes are almost identical with those of actinolite, tremolite and non-fibrous anthophyllite.

If we turn to a consideration of the medical aspects of the talc situation, some light can be thrown on the reasons behind the indictment of talc as a suspicious mineral and tremolite as a "bad actor". As far back as 1955 Dr. G. W. H. Schepers reported on the effects of talc dust on the human lung in a study of tremolitic talc miners in Western New York State. Later, in the 1960's Dr. Morris Kleinfeld made epidemiological studies of talc miners and millers in New York State. Although their findings were not conclusive, and no scientific evidence of any carcinogenicity of talc per se was disclosed, they did throw a certain amount of suspicion on tremolite and talcs in general. Unfortunately, these studies not only have cast a prejudicial light on the question of biological response to commercial talcs, but have resulted in the lumping together of tremolite and the "fibrous" form of talc with dangerous types of asbestos such as crocidolite, that have been proven definitely harmful.

It was because of the uncertainties of various epidemiological studies that Dr. W. E. Smith, working in the Health Research Institute at Fairleigh Dickinson University in Madison, New Jersey, embarked on a project to study the carcinogenicity of various mineral dusts, using the hamster as a suitable, experimental animal model. A copy of Dr. Smith's report is enclosed as Appendix B. The tremolite talc (#14) in Dr. Smith's project is a New York State talc containing 50% tremolite, 10% antigorite, 2-5% chlorite, and 35% talc, with a median particle size of 0.5 microns. A photomicrograph of the sample reveals the usual distribution of rods, nodules, plates and short acicular particles characteristic of New York State talcs. The lack of pleural tumors in animals injected with this talc is significant when a comparison is made with the results from animals injected with true asbestos.

More recently, Dr. Schepers, now Chief, Medical Services, at the Veterans Hospital, Lebanon, Pennsylvania, has come forth with a new consideration of the relative hazards of various silicate minerals. Dr. Schepers has written a letter (see Appendix C) to Mr. R. C. Bacon, former Director of Mining Operations, R. T. Vanderbilt Company, Inc., in answer to a request for the chest surgeon's latest opinions on talc and asbestos in the light of all the investigations that have taken place in this area since the early 1950's. You will note that Dr. Schepers applies

CRMC-MAD-000392

Mr. Alan T. Spiher, Jr.

- 4 -

April 17, 1973

different ratings of hazard to each type of silicate mineral, and that tremolite comes closer to talc than to the true asbestos minerals. We find the same regard for the degree of hazard indicated in regulations concerning silicate and asbestos minerals in Great Britain, where experience with various forms of asbestos is probably greater and of a longer time period than any other industrial nation. It is not surprising that Dr. Smith finds a varied biologic response to different types, dosages and shapes of silicate mineral dusts, but it is surprising and unfortunate that hygienists and medical consultants in this country continue to disregard the wide differences in degree of hazard of the substances for which government regulations are laid down.

In conclusion, it should be stressed that a valuable, economic product is in jeopardy of being penalized for lack of adequate definition when no conclusive evidence of hazard has been disclosed. We maintain that the tremolite found in tremolitic talcs is not asbestos and, therefore, no more hazardous than talc itself. However, unless a realistic definition of the term "asbestos-form particle" is rendered, not only a great portion of the pure talc being sold today but also those talc products containing even the slightest proportion of the talc-like mineral tremolite will be eliminated from food packaging materials. It is even possible to foresee the elimination of all mineral dusts from the role of fillers and coatings for these materials if the term "asbestos-form particle" is misinterpreted or stretched to include particles of certain shapes regardless of chemical composition.

Very truly yours,

R. T. VANDERBILT COMPANY, INC.

Allan M. Harvey, Manager
Patent and Legal Liaison Department

AMH: sb

Enclosures

P.S. In our original request for additional time in which to comment on the proposed talc amendment, we referred to proposed studies of talcs by x-ray diffraction techniques. Considerable work was done but no meaningful contribution to the problem of defining "asbestos-form particles" was generated since this means of identification does not differentiate between asbestos-form and non-asbestos-form minerals. However, since the proper identification of various types of minerals to be found in talcs normally used in food packaging materials is critical, our opinion regarding a satisfactory method is expressed in the accompanying statement (Appendix B).

CRMC-MAD-000393

Bibliography of Asbestos Terms

1. "In the mineralogical sense the term asbestos is extended in part also to other fibrous minerals, without reference to composition, structural constitution, properties, and technical-industrial significance. Two main groups are differentiated with respect to origin, mode of formation, mineralogical relationships, structure, composition, and properties of the asbestoses: namely, the serpentine asbestoses (chrysotiles) and the amphibole asbestoses. The fibrous crystalline variants of the minerals have in part been given individual names to which, in the interest of a precise terminology, the word asbestos must not be appended. For example, the fibrous form of serpentine is called chrysotile, serpentine-asbestos, or fibrous serpentine - but NOT chrysotile asbestos. The accepted names of the five asbestoses used commercially are given as follows:

<u>Group</u>	<u>Designation of Mineral</u>	<u>Designation of Asbestos</u>
Serpentine Asbestos	Serpentine	Chrysotile
Amphibole Asbestos	Riebeckite	Crocidolite, Blue Asbestos
	Gruenerite	Amosite
	Anthophyllite	Anthophyllite Asbestos*
	Tremolite	Tremolite Asbestos*

*These varieties have no special designation."

(Reference: Berger, Hans, trans. by Ralph E. Osper, Asbestos Fundamentals - Origins, Properties, Mining, Processing, Utilization Chemical Publishing Company, Inc., New York, 1963.)

* * * * *

2. "Asbestos is the common name given to a number of inorganic, fibrous, silicate minerals that possess a crystalline structure. Chrysotile, the most abundant of these fibrous silicates and the one most extensively used in industry, belongs to the serpentine group of rock-forming minerals and is mined mainly in Canada, Russia, and Rhodesia. The other forms of asbestos belong to the amphibole group. They are crocidolite, commonly known as 'blue asbestos' which is found in South Africa; Western Australia and Bolivia; amosite which occurs only in South Africa; anthophyllite, the fibrous form of which is found in Finland and Africa; and the fibrous forms of tremolite (available in Italy) and actinolite, which has been found in South Africa."

"'Asbestos' means any of the following minerals, that is to say, crocidolite amosite, chrysotile, fibrous anthophyllite and any mixture containing any of the said minerals."

(Reference: Health and Safety at Work #44, Asbestos Health Precautions in Great Britain Department of Employment, HM Factory Inspectorate, United Kingdom, 1971.)

* * * * *

3. "Asbestos, 'amphibole' asbestos, 'hornblende' asbestos, and 'Italian' asbestos are various terms given to the monoclinic amphiboles, tremolite $\text{Ca}_2\text{Mg}_5(\text{Si}_8\text{O}_{22})(\text{OH},\text{F})_2$ and actinolite, $\text{Ca}(\text{Mg},\text{Fe})_2(\text{SiO}_3)_4$, when they occur in fine silky fibers."

(Reference: Ladoo, Raymond Bardeen, Non-Metallic Minerals, 1st Edition, McGraw-Hill, New York, 1925.
Ladoo, Raymond Bardeen, and W. M. Myers, Non-Metallic Minerals, 2nd Edition, McGraw-Hill, New York, 1951.)

* * * * *

4. "Actinolite. Calcium-magnesium-iron amphibole.....In crystals, either short- or long-bladed, as in tremolite; columnar or fibrous; granular massive.... The fibrous and radiated kinds are often called asbestiform actinolite and radiated actinolite.....ASBESTOS. Asbestos. Tremolite, actinolite, and other varieties of amphibole, excepting those containing much alumina, pass into fibrous varieties, the fibers of which are sometimes very long, fine, flexible, and easily separable by the fingers, and look like flax. These kinds are called asbestos (from the Greek for incombustible).....CROCIDOLITE. Blue Asbestos -- Probably to be considered as a fibrous variety of riebeckite. Fibrous, asbestos-like; fibers long but delicate and easily separable."

(Reference: Dana, Edward Salisbury, A Textbook of Mineralogy with an Extended Treatise on Crystallography and Physical Mineralogy, John Wiley & Sons, Inc., New York, 1947.)

* * * * *

5. "Serpentine occurs in two distinct forms: (1) a platy variety, antigorite, which conforms in its properties to those of the phyllosilicates, and (2) a fibrous variety, chrysotile."..."The variety chrysotile is the chief source of asbestos. The uses of asbestos depend upon its fibrous, flexible nature, which allows it to be made into felt and woven into cloth and other fabrics, and upon its incombustibility and slow conductivity of heat. Asbestos products, therefore, are used for fireproofing and as an insulation material against heat and electricity. Massive serpentine, which is translucent and of a light to dark green color, is often used as an ornamental stone and may be valuable as building material."

(Reference: Hurlbut, Cornelius S. Jr., Dana's Manual of Mineralogy, 18th Edition, John Wiley & Sons, Inc., New York, 1971.)

* * * * *

6. "Amosite: A commercial term for an iron-rich, asbestiform variety of amphibole occurring in long fibers. It may consist of an orthorhombic amphibole (anthophyllite or gedrite) or of a monoclinic amphibole (cummingtonite or grunerite)."

"Asbestos: A commercial term applied to a group of highly fibrous silicate minerals that readily separate into long, thin, strong fibers of sufficient flexibility to be woven,.....certain fibrous varieties of amphibole..."

"Crocidolite: A lavender-blue, indigo-blue, or leak-green asbestiform variety of riebeckite, occurring in silky fibers and in massive and earthy forms. Syn: Blue asbestos: Krokidolite."

(Reference: Gary, Margaret, R. McAfee, Jr., and C. L. Wolf, Glossary of Geology, American Geological Institute, Washington, D. C., 1972.)

* * * * *

7. "Riebeckite also occurs as an extremely fibrous mineral, when it is known as blue asbestos or crocidolite. The best known occurrences of blue asbestos are in South Africa where it occurs in bedded ironstones, the seams of crocidolite conforming to the bedding of the ironstones. The composition of the crocidolite is remarkably similar to that of the ironstone and the crystallization of the amphibole, initially in the form of massive riebeckite, occurred with little or no addition of material under conditions of moderate temperature and pressure consequent on the burial of the ironstones to moderate depth."...."Both Beach (1928) and Hall (1930) favour the hypothesis that Na_2O was originally uniformly distributed throughout the ironstone and subsequently concentrated in certain bands. The later transformation of the massive riebeckite to the fibrous crocidolite may result from the instability of the riebeckite during a period when the ironstones were subjected to shearing stress."....The members of the cumingtonite-grunerite series are typically found in both regionally and contact metamorphosed rocks. The more magnesian members are found also in some igneous rocks, including those of hybrid origin. The asbestiform varieties amosite and montasite are of economic importance."...."The characteristic habit of the members of the cumingtonite-grunerite series is acicular or fibrous. The asbestiform variety, amosite when fresh is ash-grey in colour; the mineral, however is frequently coated with iron oxides, when the colour is brown to yellow. The fibres of the montasite variety are less harsh than amosite and are often soft and silky in texture."...."The habits of the anthophyllite minerals vary from fibrous and asbestiform to bladed and prismatic. The fibers of anthophyllite asbestos generally do not have any great tensile strength and are of less economic importance than the amosite and crocidolite fibres."...."Mass-fiber anthophyllite asbestos occurs as a replacement mineral in ultrabasic rocks at Kamiah, Idaho (Anderson, 1931)."....Laudermilk and Woodford (1930) have described an asbestiform anthophyllite in veins in serpentinite at Coffe Creek, Carville, California."

(Reference: Deer, W. A., R. A. Howie, and J. Zussman, Rock Forming Minerals, Volume 2, Longman Group Ltd., London, 1963.)

* * * * *

8. "The principal minerals of the serpentine group all have the approximate composition $H_4Mg_3Si_2O_{10}$, and comparatively little substitution of other ions is found to occur in natural specimens. The most well known serpentine mineral, chrysotile, often occurs in veins of silky fibers and is the most important source of commercial asbestos."

(Reference: Deer, W. A., R. A. Howie, and J. Zussman, Rock Forming Minerals, Vol. 3, Logmans, Green and Co. Ltd., London 1962.)

* * * * *

9. "Mineralogically, asbestos includes the fibrous forms of amphibole; the fibers are generally very long, fine, flexible, and easily separated by the fingers; the color..... The term asbestos in the strictest sense is confined to the fibrous forms of actinolite, but the asbestos of commerce includes fibrous varieties of a number of silicates...."

(Reference: Read, H. H., Rutley's Elements of Mineralogy, 25th Edition, Thomas Murby & Co., London, 1955.)

* * * * *

10. "Tremolite does not break down into fibers that approach a uniform rectangular cross section, as crocidolite does. Two samples (figs. 9 and 10) indicate that the fibers break into fragments. Some of the fragments are quite thin, while others are rather thick. The fragments are composed of thin sheets. Some of the small sheets (fig. 9) are so thin that they are almost translucent to the electron beam. Dark streaks are again noticeable in the thin sheets of tremolite as they are slightly wrinkled for Bragg reflections. The thin sheets are probably less than 100 Å. in thickness."

"Actinolite is generally considered the basic amphibole asbestos member. The fibers of actinolite are quite poor; and, because it rarely has commercial value, it is not very well known. The sample examined was splintery and very brittle. It was not expected that the mineral would break down into fibers for electron microscopic study, but we felt it worth the effort to try, since it is the basic member of the amphibole group. Figure 11 reveals that it did not break into single fibers. Low magnification was used, as the material broke into large, opaque pieces."

(Reference: Huggins, Charles W., Electron Micrographs of Asbestiform Minerals, Report of Investigations 5551, Bureau of Mines, U. S. Department of The Interior, 1959.)

* * * * *

11. "The name 'asbestos' is used to describe any mineral that breaks down into fibers when it is crushed or processed."

(Reference: Gaze, Richard, "The Physical and Molecular Structure of Asbestos." Ann. N.Y. Acad. Sci., Art. 1, 132, pp. 23-30 1955)

* * * * *

CRMC-MAD-000397

12. "Asbestos: 'Asbestos' is the name given to a group of hydrous magnesium silicate minerals which have a fibrous texture. The crystal structure of these minerals is characterized by the presence of long chains of silicate tetrahedra which can be readily cleaved in directions parallel to the silicate chains but not in directions that cut the chains, with the result that these minerals can be shredded into fibers..."

(Reference: Kingery, W. D., Introduction to Ceramics, John Wiley and Sons, Inc., New York, 1963.)

* * * * *

13. "Asbestos is not a distinct material but a commercial term used to express the fibrous nature of several minerals."

(Reference: United States Bureau of Mines, Foreign Minerals Division, Mineral Raw Materials, p. 16, McGraw-Hill Book Company, Inc., New York, 1937.)

* * * * *

14. "Asbestos, any of several varieties of fibrous minerals whose fibres may be spun or felted to make fabrics, panels, or coatings that are resistant to heat and chemical action. Asbestos is also valued for its electrical insulating properties."

(Reference: Colliers Encyclopedia - 1972.)

* * * * *

15. "Asbestos, general name for a group of silicate minerals that occur as fibers or fibrous masses and that can be woven into heat resistant materials. The fibers are separated mechanically and pressed, spun, or woven, often with cotton, wire, rubber, or cement, to produce fireproof articles of all types: clothing, curtains, electric cable insulation, brake linings and clutch facings, insulating boards, sheets, shingles and talcs."

* * * * *

16. "Asbestos is a fibrous mineral substance... In its natural state, asbestos is found encased in rocks. Its fibrous quality makes it a remarkable mineral. Asbestos is as dense as the rock in which it is encased, but it is a mass of tiny fibers that become as fluffy and light as thistledown when separated mechanically from rock."

(Reference: Encyclopedia Americana - International Edition - 1969.)

* * * * *

Bibliography of Asbestos Terms

- 6 -

Appendix A -

17. "Fibre - A fibre may be defined as a unit of matter of hair-like dimensions whose length is at least 200 times greater than its width."

(Reference: Enclyopedia Britannica - 1971.)

* * * * *

March 23, 1973

S. Lincoln Avenue
Lebanon, PA 17042

R. C. Bacon
Director, Research and Development
R. T. Vanderbilt Company, Inc.
33 Winfield Street
East Norwalk, Connecticut 06855

Dear Mr. Bacon

RE: Talc (0) Tremolite (H), Chrysotile (2+),
Anthophyllite (3+), Amosite (4+),
Crocidolite (10+) etc

Thanks for consulting me about these items. As you know from my publications I have had considerable experience in decoding the biological action of the fibrous silicates. This is based both on elaborate inhalation experiments, human exposures with necropsy studies, and of course review of the literature.

The order in which I have listed these fibrous minerals represents my interpretation as to their capacity for inducing biological responses. Talc is listed first and given a zero rating since it is in pure form, practically innocuous except for overwhelming prolonged exposure. The latter is no longer permissible in the USA so, for practical purposes, this substance is harmless.

Crocidolite, by contrast, is listed last and given a 10+ or maximal rating. It can with relatively minor exposure, produce exceedingly serious and progressive changes in the lungs or wherever it becomes lodged. One of these effects is the capacity to produce neoplastic disease.

Talc, Tremolite and Chrysotile need to be discussed a little more fully.

Pure mineral talc of the non-tremolite kind, does not induce a tissue response of any clinical significance. If there is prolonged exposure the lung alveoli and some lymphatics can trap phagocytic cells which ingested the talc particles and this may block out their functions temporarily. This type of pathology is called a thesaurosis or storage effect. It is usually reversible on cessation or decrease of exposure and no significant permanent after-effects result.

The same applies for tremolite talc. It is inert like Georgia talc and induces only a thesaurosis effect when there is excessive prolonged exposure. However, Tremolite sometimes is "contaminated"

X-RAY DIFFRACTION ON TALCS AND TALC MINERALS

X-ray diffraction studies of the serpentine polymorphs, chrysotile, antigorite, and lizardite indicate that the presence of this group can be detected at levels of approximately 1% in spiked samples but this presence in an unknown mixture cannot be verified until levels approximate 3-5%, particularly with the presence of chlorite group minerals. The individual polymorphs cannot be distinguished, fibrous vs. non-fibrous forms, until much higher levels are obtained (25%) and even then with difficulty.

The same holds true for the amphibole group. At the 1% level, the presence of a member of this group could be detected (or at least suspected) but higher levels must be present before specific species could be identified. In particular, it is very difficult to distinguish between fibrous and non-fibrous forms of the same mineral by this method, i.e., crocidolite vs. riebeckite.

Yet, X-ray diffraction is the only generally available method of qualitative and quantitative mineral phase determinations of industrial minerals. It is, therefore, strongly urged that X-ray diffraction scanning be designated as the primary screening instrument in the detection of suspected asbestos minerals. If reflection peaks are present in areas which are indicative of serpentine or amphibole group minerals, light microscopy with a petrographic microscope should be used to identify the particular phase present and determine, if possible, its general morphology, i.e. fibrous or non-fibrous. Further identification and morphological determination could be gained using dispersion staining and phase contrast microscopy.

R. C. Bacon

March 23, 1973

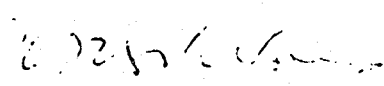
with chrysotile or other true asbestos type fibrous minerals. When this is the case, the thesaurosis becomes a thesaurismosis ie the alveolar walls and perilymphatic tissues begin to react, and fibrous tissue forms. This is due to the asbestos fibers and not the tremolite component. The fibrotic response is directly proportional to the ratio of asbestos fibers admixed with the tremolite. You will note from one of my experiments that when small quantities of chrysotile were mixed with gypsum the chrysotile effect never-the less prevailed despite dilution with the inert gypsum.

This sounds like I make chrysotile out to be a bad actor. It is true that prolonged exposure to chrysotile will produce asbestosis but of a relatively mild kind. In comparison, however, with what Crocidolite does, Chrysotile is a relatively tame beast. There are a number of persons currently making excessive propaganda about Chrysotile. Their noise tends to drown out the voices of sanity. The hullabaloo will of course go on for some time. Progressively, however, the evidence is coming in that Chrysotile causes only a fine interstitial fibrosis without blocking off the respiratory surfaces. The patient develops some disability because of stiffening of his lungs, but can survive for a long time with fairly good gas exchange. I have never yet seen a case of lung cancer caused by Chrysotile alone and no one else has ever been able to show me a case either. In mixed sequential exposure experiments with beryllium sulfate as a potent carcinogen and Chrysotile as a potential co-carcinogen, the surprise finding was that Chrysotile acted as an anti-carcinogen.

Of course, if one mixes Chrysotile with Amosite, Crocidolite or Silica exposures, bad effects follow - read bad. Possibly this is why Chrysotile got a bad name.

I hope this summary is of help to you. If I can provide more detail, please let me know.

Sincerely,


GERRIT W. H. SCHEPERS, M.D., D.Sc.

CRMC-MAD-000402

X-RAY DIFFRACTION ON TALCS AND TALC MINERALS

X-ray diffraction studies of the serpentine polymorphs, chrysotile, antigorite, and lizardite indicate that the presence of this group can be detected at levels of approximately 1% in spiked samples but this presence in an unknown mixture cannot be verified until levels approximate 3-5%, particularly with the presence of chlorite group minerals. The individual polymorphs cannot be distinguished, fibrous vs. non-fibrous forms, until much higher levels are obtained (25%) and even then with difficulty.

The same holds true for the amphibole group. At the 1% level, the presence of a member of this group could be detected (or at least suspected) but higher levels must be present before specific species could be identified. In particular, it is very difficult to distinguish between fibrous and non-fibrous forms of the same mineral by this method, i.e., crocidolite vs. riebeckite.

Yet, X-ray diffraction is the only generally available method of qualitative and quantitative mineral phase determinations of industrial minerals. It is, therefore, strongly urged that X-ray diffraction scanning be designated as the primary screening instrument in the detection of suspected asbestos minerals. If reflection peaks are present in areas which are indicative of serpentine or amphibole group minerals, light microscopy with a petrographic microscope should be used to identify the particular phase present and determine, if possible, its general morphology, i.e. fibrous or non-fibrous. Further identification and morphological determination could be gained using dispersion staining and phase contrast microscopy.

R. T. VANDERBILT COMPANY, INC.
33 WINFIELD STREET
EAST NORWALK, CONNECTICUT 06855

CABLE ADDRESS
SILTVAN NEW YORK

April 18, 1973

Mr. Richard Carter
Counsel
Johns-Manville Corporation
5680 South Syracuse Circle
Denver, Colorado 80217

Dear Dick:

Paul Gibney asked me to send you our latest revision of the
FDA talc comment. Attached are all documents except the book of microphotographs
and Dr. W. E. Smith's report, which I believe you already have.

Very truly yours,

R. T. VANDERBILT COMPANY, INC.

al

Allan M. Harvey, Manager
Patent and Legal Liaison Department

AMH: sb
Enclosure

CRMC-MAD-000404

C.J. Sulewski

August 21, 1974

P.A. Martinson

TALC LABELING

H.R. Keefe and the writer met this date with J.F. Solon, R.P. Carter, and E.M. Femmer.

There is obviously considerable confusion on the total subject including the interpretation of the definition of an asbestos fiber.

It is recognized that the 1972 OSHA regulation clearly requires that talc containing asbestos fiber must be labeled. However, M.E.S.A., who has published the same definition of asbestos fiber as OSHA, has advised R.P. Carter that in all of the talc samples they have analyzed thus far, they have detected no tremolite fibers in accordance with their unpublished and informal definition of a fiber. Apparently, some governmental agencies interpret the definition in another manner than literally.

Because of this confusion, Filtration and Minerals management to date has delayed labeling Desertalc products.

In consideration of the many facets, including continued confusion, brought out at today's meeting, the writer is making the decision to further delay labeling to not later than November 1, 1974, providing a label is required and this requirement subject to clarification based on investigations and findings as follows:

1. R.P. Carter to contact R. Bacon of R.T. Vanderbilt Company to determine status of visit by OSHA and NIOSH people to their plant for the purpose of taking samples for analysis.
2. R.P. Carter to contact Mr. Boyd of OSHA regarding talc sampling -- the source of samples - whether air samples (plant or mine or both, etc.).

Also, details of methodology for sample evaluation, analytical or other.

CRMC-MAD-000405

3. With the information of Items #1 and #2 and through Mr. Solon and his people, a decision will be made what further sampling needs to be done in J-M operations -- plants or mines as well as finished product sampling and evaluation -- the latter using OSHA methodology.

4. R.P. Carter will follow with OSHA/NIOSH to determine results of sampling at R.T. Vanderbilt and determine if air sample analytical results are to be interpreted as representative of actual product sampling and evaluation.

All of above in attempt to have OSHA/NIOSH evaluate J-M talc on same basis as they evaluate R.T. Vanderbilt talc and for opinion from OSHA/NIOSH as to the question of: Does J-M talc contain asbestos fiber in OSHA/NIOSH's opinion?

It is expected that guidance from Solon's people on Item 1 through 4 will be available within the next 15 days and further procedural steps will be determined and implemented and all advised accordingly.

cc:
J.A. McKinney - 5W
F.L. Pundsack - R&D
J.F. Solon, Jr. - 4N
W.L. VanDerbeek - 2S
Dr. Paul Kotin - 4N
E.M. Fenner - "
R.P. Carter - "
W.B. Reitze - "
R.S. Lanar - R&D
S.R. Speil - "
W.C. Streib - "
H.N. Havens
T.M. Jackson
C.I. Keelan
F.D. Richards
D
C



Johns-Manville

Internal Correspondence

To: MEMO TO FILE

Date: Nov. 13, 1973

From: R. P. Carter

Copies: File & C

Subject: RE: MEETING WITH JOHN O'NEILL - NOVEMBER 8, 1973
MEETING WITH JERRY SCANNELL AND JOHN O'NEILL - NOV. 9, 1973

Several weeks ago, upon learning that John Stender had decided not to appoint a Standards Advisory Committee in connection with the reopening of the asbestos standard, I called Jerry Scannell's office for the purpose of setting up a meeting with Jerry to determine why this decision had been made and what Johns-Manville and the asbestos industry could do to assist OSHA in promulgating a new standard. Jerry Scannell was out of town on business in Hawaii for a period of three weeks and therefore, the meeting could not be set up until November 9.

After a meeting was scheduled with Jerry Scannell for November 9, I was advised that John O'Neill would be delivering a presentation to the annual meeting of the A/C Pipe Producers Association in Washington on November 8. I attended that meeting and had the opportunity to informally speak with John O'Neill in addition to listening to his presentation.

During our informal conversation, John O'Neill indicated that one of the primary reasons for Stender's decision against the establishment of a Standards Advisory Committee was due to the fact that if such a committee was appointed, Dr. Irving J. Selikoff would have to be included as a member of the committee. I got the impression from O'Neill that Stender felt that Selikoff's presence on the committee would impair the functioning of the committee. O'Neill further indicated to me that the thrust of the revision would be the establishment of work practices. I indicated to John that it could conceivably take several years to prepare work practices for each segment of the asbestos industry. John agreed, but indicated that they would attempt to prepare work practices by processes which were common in each segment of the industry. During our informal discussion, John O'Neill mentioned that he had read the first two installments of Paul Brodeur's series of articles in the New Yorker Magazine. John was not happy

CRMC-MAD-000407

MEMO TO FILE

Page 2

November 13, 1973

with these articles as it presented a very one-sided picture of the asbestos industry and was concerned with several unfavorable comments made about certain government employees. During his presentation, John O'Neill made specific reference to the unfair treatment of the asbestos industry in the news media and how only one side of the story was being told, which in his opinion, was quite unfair.

During his presentation before the A/C Pipe Producers Association, John O'Neill was quite candid in his remarks regarding the reopening. I did not get the impression that John O'Neill was speaking from any prepared notes but was rather making off-the-cuff remarks. The key points covered by John O'Neill in his presentation were as follows:

- (1) The OSHA standard for exposure to asbestos dust was written only to prevent asbestosis and was not designed to prevent mesothelioma or cancer.
- (2) The new evidence which OSHA now has is that fibers other than asbestos can cause mesothelioma.
- (3) The British data upon which the current OSHA standard was based is weak and not scientific.
- (4) OSHA wants to re-evaluate the TLV for asbestos.
- (5) When preparing the current asbestos standard, OSHA did not take into consideration the talc mining problem. He indicated that tremolite is not fibrous and it has not been proven that tremolite causes any harm. OSHA therefore, must re-examine the types of asbestos covered. (During this past Summer, R. T. Vanderbilt and Company, a major talc producer, filed a petition with OSHA requesting a modification of the asbestos standard, basically deleting tremolite from the standard.)
- (6) The method of sampling and measurement must be re-examined. In a phase contrast system, it is difficult to differentiate and distinguish fibers.
- (7) The types of respirators permissible must be re-examined. As of April 1, 1974, many respirators will lose their current approval.

CRMC-MAD-000408

MEMO TO FILE

Page 3

November 13, 1973

- (8) OSHA wants to re-examine monitoring.
- (9) Work practices must be developed, evaluated and made mandatory.
- (10) Asbestos is essential in many uses and OSHA has no intent to ban its use. Rather, OSHA is desirous of establishing safe ways of using asbestos.
- (11) John Stender has opted for the use of outside consultants in lieu of appointing a Standards Advisory Committee.
- (12) OSHA wants the new standards to be very clear. One of the strong reasons for reopening the standard is due to a large number of inquiries OSHA has received during the past year and a half for clarifications and interpretations of the standard. It is their conclusion based on the volume of requests that the current standard is not clear.
- (13) The current numerical standard will probably remain unchanged.
- (14) OSHA would like considerable input from industry to assist them in drafting a new standard.

On November 9, Jack Solon and I met with Jerry Scannell at his office. When we arrived, John O'Neill was also present in Jerry Scannell's office. Jerry indicated that he was currently in the process of preparing a written proposal to John Stender which would consist of a procedure to draft and promulgate a revised asbestos standard. This proposal would be in lieu of the establishment of a Standards Advisory Committee, in view of the fact that Stender had rejected the establishment of such a committee. Jerry's recommendation to Stender will be for OSHA to prepare a draft of a new asbestos standard which would take at least three to four months. Then OSHA would use outside consultants, individuals picked from industry and labor, to be used by OSHA on an individual basis. For example, Scannell would propose contacting AIA to receive recommendations for individuals to be used as consultants. At individual meetings with these consultants, OSHA would discuss particular portions of the proposed revisions with experts in specific areas. After OSHA has met with these consultants they would then arrange to visit various plants in the asbestos industry to determine the practicality of the revised standard. Jerry Scannell indicated that he had

CRMC-MAD-000409

MEMO TO FILE
Page 4
November 13, 1973

received a ruling from their attorneys to the effect that such a plant visit could not be the basis for an OSHA citation. Jerry was quite concerned that various companies might object to OSHA's presence in a plant due to a possible citation exposure. Jerry would like every effort to be made by OSHA to insure their credibility with industry that citations would not be issued as a result of these plant visits. As a matter of fact, he would attempt to work out an arrangement with OSHA enforcement people so that no plant inspections would be made in those establishments visited for a period of at least one year after their plant visit. Following the plant visits, OSHA might perhaps meet on a group basis with all of the consultants for the purpose of reviewing a final draft of the proposed regulations. During the entire process, the proposed regulations would be revised and altered informally as necessary. The final step would be the publication of a new proposed standard in the Federal Register, which probably would not take place before a period of one year from now. At the time the new proposed regulations are published, OSHA might announce a hearing date at that time if they feel there will be substantial comments or objections to the proposal. Jerry indicated it was conceivable that if no meaningful objections were made to the proposal, no hearing at all might be scheduled.

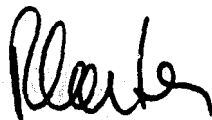
Towards the conclusion of our meeting, Jerry Scannell indicated that there were several things he would like from J-M:

- (1) A letter on how we would like the asbestos standard modified. For example, what aspects of the standard are currently unclear or impractical.
- (2) Provide OSHA with suggestions for improving monitoring and fiber counts, perhaps including a proposal for scrapping fiber counts.
- (3) How can OSHA get Labor and Management together to discuss a new proposed standard without such a meeting being conducted on an adversary basis.
- (4) After Ed Fenner establishes a Technical Committee within AIA, Ed Fenner should contact John O'Neill to discuss whatever assistance the Technical Committee can give him in drafting a new standard.

CRMC-MAD-000410

MEMO TO FILE
Page 5
November 13, 1973

- (5) Jerry Scannell may need assistance from J-M and other companies in the industry in selling his new proposal to John Stender. In view of the fact that J-M and other companies have sent letters to Stender advocating the establishment of a Standards Advisory Committee, it might be desirable at some point in time for us to advise Stender that we support Jerry Scannell's new proposal. In this regard, it is my intention to contact Jerry Scannell at the earliest possible time to advise him that J-M fully supports his new proposal to Stender and advise him that we would like to cooperate in any way possible to assist him in selling his proposal to Stender. I will suggest to Jerry that he give consideration to arranging a meeting for J-M with Stender, at which time he should be present, for us to convey our support of his proposal to Stender. The timing of such a meeting should be left to Scannell.



R. P. Carter

P.S. - After dictating this memo, I spoke with Jerry Scannell by telephone at which time he advised me that he had presented his proposal to Stender and Stender had accepted his suggestions. I then asked Jerry if we should either write or call Stender for a meeting to indicate our support of their new proposal. Jerry said the decision was up to us but we should either call for a meeting or present our views in a letter to Stender. It is my present plan to draft a letter to Stender withdrawing our request for the establishment of a 15-man Advisory Committee and supporting Scannell's proposal. I intend to read a draft of this letter to Scannell over the telephone and ask his suggestion as to whether or not the letter should be sent or a personal meeting arranged.

CRMC-MAD-000411



Johns-Manville

Internal Correspondence

To: See below*

Date: November 7, 1974

From: Paul Kotin, M.D., 4N

NOV 8 1974

Copies: F. J. Solon, Jr.
R. Carter

JK

Subject: TALC LABELING

*W. R. Goodwin, 5W
F. H. Jay, Jr., 5W
J. A. McKinney, 5W

F. L. Pundsack, RSD
C. J. Sulewski, 2W
W. L. VanDerbeek, 2S

We have been informed by Mr. Robert Bacon, Assistant to the President of R. T. Vanderbilt Company (a major talc competitor) that J-M's decision to insert asbestos caution labels on all talc shipments will result in "irreparable damage" to Vanderbilt. Mr. Bacon requested that this matter be brought to the attention of the highest level of management, and he stated that he was asking Mr. Hugh Vanderbilt, President of R. T. Vanderbilt, to call a senior officer at J-M to voice their concern and their belief that it is J-M's intention to hurt their company.

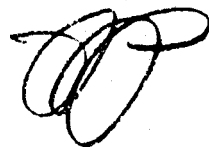
The purpose of this memorandum is to alert you to the situation in the event you are contacted by Mr. Vanderbilt. Our decision to label talc was based on our conviction that J-M's talc contains fibrous asbestos and in no way reflects any intention to hurt or destroy the Vanderbilt Company. If you would like additional details on this matter, please call me.

CRMC-MAD-000412

C.J. Sotelo, Jr.

August 21, 1974

P.A. Martinson



TAIC LABELING

H.R. Keefe and the writer met this date with J.F. Sotelo, R.P. Carter, and L.N. Fenner.

There is obviously considerable confusion on the total subject including the interpretation of the definition of an asbestos fiber.

It is recognized that the 1972 OSHA regulation clearly requires that talc containing asbestos fiber not be labeled. However, M.H. Sotelo, who has published the same definition of asbestos fiber as OSHA, has advised R.P. Carter that in all of the talc samples they have analyzed thus far, they have detected no tremolite fibers in accordance with an unpublished and internal definition of a fiber. Apparently, some government inspectors interpret the definition in another manner than literally.

Because of this confusion, Filtration and Minerals management to date has delayed labeling Besacore products.

In consideration of the many facets, including continued confusion brought out at today's meeting, the writer is urging the need for further delay labeling to not later than November 1, 1974, until a label is required and this requirement subject to clarification based on investigations and findings as follows:

1. R.P. Carter to contact R. Brown of R.F. Vanderbilt Company to determine status of visit by OSHA and NIOSH people to their plant for the purpose of taking samples for analysis.
2. R.P. Carter to contact Mr. Lloyd of OSHA regarding talc samples - the source of samples - where and in what place (plant or mine or home, etc.).

Also, need for methodology for sample evaluation, analytical or other.

CRMC-MAD-000413

3. With the incorporation of Hous 14 and 15 and through Mr. Solon and his people, a decision will be made as to the sample needs to be done in 24 operations - sample size, as well as finished product - before and evaluation of the labeling methodology.
4. R.P. Carter will follow with O.H.V. and the necessary results of sample size. As a result of the sample size, the sample size will be determined and the sample size will be determined.

All of above is attempt to have O.H.V. and the necessary results of sample size. As a result of the sample size, the sample size will be determined and the sample size will be determined.

It is expected that guidance from Solon's people on Item 1 through 4 will be available within the next 15 days and further procedural steps will be determined and implemented and all advised accordingly.

cc:
J.A. McKinney - 5W
F.L. Pondsack - R&D
J.W. Solon, Jr. - 4N
W.L. Vanderbeek - 28
Dr. Paul Korin - 4N
E.M. Fenner - "
R.P. Carter - "
W.B. Reitze - "
R.S. Lanar - R&D
S.R. Speil - "
W.C. Streib - "
H.N. Havens
T.M. Jackson
C.L. Keelan
F.D. Richards
D
C

Continuation Sheet Schedule	Ref. No. of Doc Being Cont'd	Page 8
Name of Offeror or Contractor	Contract No: F34601 77-C-1571	

SECTION I - INSPECTION & ACCEPTANCE

I-1. INSPECTION AND ACCEPTANCE POINTS:

- ☒ See Section E, hereof ☐ Origin, Item(s) _____
- ☐ Destination, Item(s) _____

I-2. INSPECTION SYSTEM/QUALITY PROGRAM FOR NEW MATERIAL:

a. The Contractor shall maintain an Inspection System/Quality Program in accordance with General Provisions clauses in Section L hereof which are applicable to this contract. In addition the following Inspection/Quality requirements shall apply:

- b. ☐ 100% End Item Inspection (Applicable if checked)
- c. ☒ MIL-I-45208A

I-3. INSPECTION NOTIFICATION:

Government inspection is required during manufacturing, the processing of material, or the performance of a service. Upon receipt of the contract and prior to the start of work, promptly notify the Government Quality Control Representative of the office to which the contract has been assigned for administration.

NOTE: If surplus material is involved, refer to I-4, Inspection and Acceptance of Surplus Material, for Inspection and Acceptance criteria.

Continuation Sheet Schedule	Ref No of Doc Being Cont'd	Page 9
Name of Offeror or Contractor	Contract No:	

SECTION J - SPECIAL PROVISIONS

J-1. SPECIAL DISTRIBUTION INSTRUCTIONS FOR MATERIAL INSPECTION & RECEIVING REPORTS (DD FORMS 250):

The DD Forms 250 required by the clause of the contract entitled "Material Inspection and Receiving Report" will be forwarded to the following addresses:

(a) The purchasing office copy to the following address:

Directorate of Procurement & Production
Wilmington City Air Logistics Center/Dir-OP
Wilmington Air Force Base, NC 28405

(b) When acceptance is at destination, four (4) copies of the DD Form 250 must accompany the goods, and one copy must be sent to the Administration Office (HAF) as noted on the cover page.

These special distribution instructions will be included in any subcontract hereunder where the items produced by the subcontractor are to be shipped directly to the Government.

[] J-2. APPROVAL OF CONTRACT: (1949 JUL) ASPR 7-105.2

(Applicable if block is checked.)

This contract shall be subject to the written approval of the Secretary or his duly authorized representative and shall not be binding until approved.

J-3. INITIAL AMENDED SHIPPING INSTRUCTIONS - FOR REFIN

(a) Pursuant to this clause the contracting officer may at any time furnish the contractor with initial or amended shipping instructions or amendments to assignment and packing instructions. A unilateral Standard Form 30 will be used for this purpose and no other contractual document will be required.

(b) The contractor shall comply with such instructions and it will be assumed that there is no adjustment in the contract price or delivery schedule.

(c) If the contractor takes exception to accomplishing the directions received at no change in price or delivery schedule, he shall so advise the contracting officer within thirty (30) days after receipt of the SF30. The contractor shall proceed with directions given in the SF30, and submit any claim for equitable adjustment pursuant to the "changes" clause of the contract. The negotiated settlement of such claims shall be reflected in a Supplemental Agreement.

(d) The contractor agrees that no claim for adjustment shall be submitted if he has not so notified the PCO within said thirty (30) day period.

CRMC-MAD-000416

C O P Y

October 9, 1974

Mr. H. B. Vanderbilt
President
Chief Executive Officer
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 08855

Dear Mr. Vanderbilt:

This is in reply to your letter of September 26, concerning your request for relief from the asbestos standard for your talcs containing non-fibrous tremolite, actinolite, and anthophyllite.

~~My letter of August 6 stated that non-fibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the asbestos standard and, therefore, the provisions of that standard do not apply to talc containing non-asbestiform minerals.~~

NIOSH is currently conducting a thorough investigation into the exact minerals to which talc workers were exposed in those studies where asbestosis or other adverse medical effects were found.

Pending the receipt and evaluation by OSHA of the report by NIOSH on this investigation, if you have scientific evidence that the naturally occurring talcs, prior to processing by milling or crushing, do not contain fibrous or asbestiform tremolite, antophyllite, actinolite or other asbestiform minerals, you may ~~certify to your customers that the talc does not contain asbestos.~~

Fibrous, asbestiform minerals such as fibrous tremolite means naturally occurring asbestiform minerals which prior to or after ~~crushing and processing, contain fibers made up of fibrils.~~

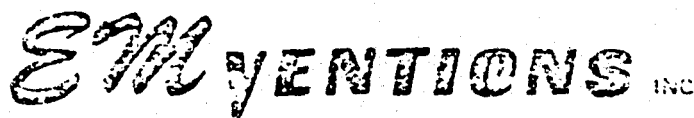
Sincerely,

/s/ John H. Stender

John H. Stender
Assistant Secretary of Labor

F 147827

CRMC-MAD-000417



MICROANALYSIS LABORATORY

CAPABILITY OF EMVENTIONS, INC FOR ASBESTOS DETECTION AND ESTIMATION

EMvention, Inc. is a company founded around a former Sperry Rand laboratory. The new company retained the technical staff and continued the programs in electron microscopy which involved technical and instrumental innovations and problem solving in materials and biomedical areas.

During the past few years our laboratory has become involved in the detection and estimation of asbestos in water, drugs, and the environment for U.S. Rubber Reclaiming Co., Vanderbilt, Johnson & Johnson, Diamond Shamrock, Donaldson, and the Food and Drug Administration. In addition we are now carrying out an academic investigation of asbestos in water samples with Dr. Henry Wehman of Rosewood Hospital in Baltimore.

Our capability in the area of asbestos detection has been enhanced by acquisition of two new scanning electron microscopes, one of which has high resolving power ($\leq 100 \text{ \AA}$) and energy dispersive microanalysis equipment.

Following is a description of our technical approach and the capabilities of our staff and consultants.

MICROMETHODS FOR
ASBESTOS SAMPLING

Prepared by:

EMVENTIONS, INC.
Microanalysis Laboratory
2351 Shady Grove Road
Rockville, Maryland 20850
(301) 948 - 6494

CRMC-MAD-000419

EM VENTIONS INC

MICROANALYSIS LABORATORY

ASBESTOS

Asbestos is the name commonly used for a group of silicate minerals which occur naturally in fibrous aggregates. These hydrated silicate minerals have the following common properties: have good electrical and thermal insulation properties, can be separated into fine fibers which can then be spun and woven into fabrics, are resistant to chemical attack, and can be fabricated into a wide range of forms easily.

Mineral group

Serpentine

Variety

Chrysotile

Amphibole

Tremolite

Actinolite

Crocidolite

Amosite

Anthophyllite

Structure

Chrysotile asbestos has a sheet structure in which there are continuous sheets of SiO_4 tetrahedra with each tetrahedron sharing three oxygens.

The amphibole asbestos occurs in a chain structure in which there are continuous chains of SiO_4 tetrahedra. The tetrahedra share alternately two and three oxygens.

Chemistry

Asbestos Type

Serpentine

Chrysotile*

General Formula

$\text{Mg}_3\text{Si}_2\text{O}_5(\text{OH})_4$

Amphiboles

Actinolite

Amosite

Anthophyllite

Crocidolite

Tremolite

$\text{Ca}_2(\text{MgFe})_5\text{Si}_8\text{O}_{22}(\text{OH})_2$

$(\text{FeMg})_7\text{Si}_8\text{O}_{22}(\text{OH})_2$

$(\text{FeMg})_7\text{Si}_8\text{O}_{22}(\text{OH})_2$

$\text{Na}_2\text{Fe}_3\text{Fe}_2\text{Si}_8\text{O}_{22}(\text{OH})_2$

$\text{Ca}_2\text{Mg}_5\text{Si}_8\text{O}_{22}(\text{OH})_2$

*95% of asbestos used in the United States.

In addition to the above elements trace amounts of other metallic elements can be found in chrysotile and the amphiboles.

CRMC-MAD-000420

TECHNICAL STAFF OF EMVENTIONS MICROANALYSIS LABORATORY

JAMES H. MC ALEAR (Ph.D. Biology, Harvard '58). President. Dr. McAlear is a well-known electron microscopist and the author of numerous papers on biological ultrastructure and techniques. In addition to his capabilities in determining the biological affects of asbestos, he is particularly concerned with development of methods for quantitative automation of asbestos analysis.

JOHN M. WEHRUNG (M.S.E.E., George Washington '65). Vice President. Mr. Wehrung is an established expert in scanning electron microscopy (SEM) and, as former Director of the Sperry Rand Microanalysis Laboratory, has experience with over 300 customers in materials and biologic disciplines. In collaboration with industry and government research agencies he has pioneered in the application of SEM to asbestos detection.

RICHARD J. HARNIMAN (B.A. Biology, Hartwick '68). Senior Associate. Mr. Harniman formerly applied scanning electron microscopy techniques to materials and microanalysis investigation for four years with the USAF in New Mexico. Presently he is responsible for implementing the asbestos research program and carrying out the observations and estimations of asbestos.

J. TEMPLETON SPARROW (Ph.D. Textiles, University of Manchester England '72). Staff Scientist. Dr. Sparrow is a co-author of a recent treatise on "The Uses of SEM", Pergamon Press 1972, and has over five years of experience in applications of the SEM to fibrous materials. His background provides an unusual capability in basic research on the nature of asbestos fibers using a materials approach.

LOUIS T. GERMINARIO (Ph.D. in Biology, Catholic University expected October 1973). Staff Scientist. Mr. Germinario has been involved in the development of SEM methods. Recently he has developed a scanning transmission capability for the estimation of asbestos in the SEM. This method duplicates transmission EM methods and incorporates many of the advantages of the SEM such as rapidity of operation and microanalysis. This is of great importance in quantitation of asbestos.

ADDISON R. KETCHUM (B.S. Civil Engineering, Union College). Vice President. Mr. Ketchum is a former Army officer and industrial executive with experience in the use of asbestos products in water and sewer facilities. He is particularly concerned with the practical aspects of civil engineering as applied to the asbestos pollution problem.

EM VENTIONS INC

MICROANALYSIS LABORATORY

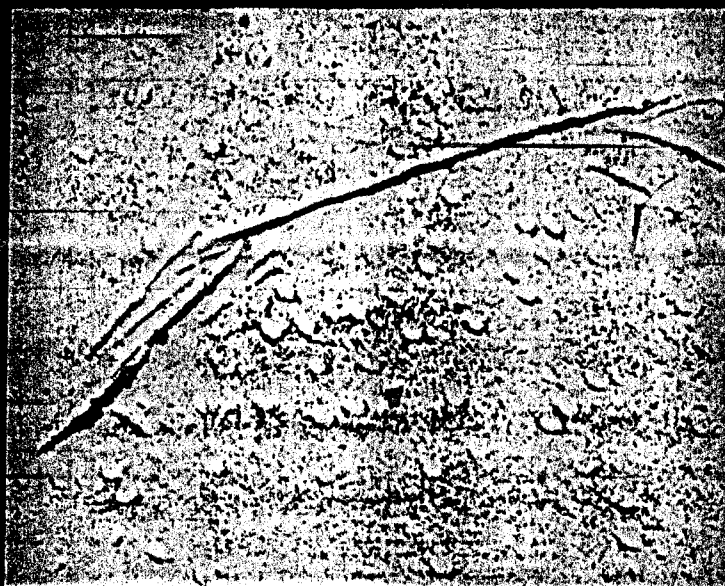
MICROMETHODS FOR ASBESTOS SAMPLING

METHOD	INFORMATION PROVIDED	COMMENTS
1. Light Microscopy	Opaque morphology	Resolution limited to > 0.2 micron.
2. X-ray Diffraction	Lattice structure	Bulk sampling only; 2% detection capability.
3. TEM	Morphology; hollow core structure	Resolution $\leq 50\text{\AA}$; specimen preparation difficult, time consuming and susceptible to contamination.
4. Electron Diffraction	Lattice structure	Specific but critical operation.
5. SEM	3-D morphology	Resolution $\leq 100\text{\AA}$; rapid, direct examination; little specimen preparation.
6. Energy X-ray Analysis	Chemical analysis of individual fibrils	Rapid; specific for Mg, Si, Na, Ca, Fe.
7. STEM	Morphology; hollow core structure	Resolution $\leq 75\text{\AA}$; specimen preparation difficult, time consuming and susceptible to contamination.

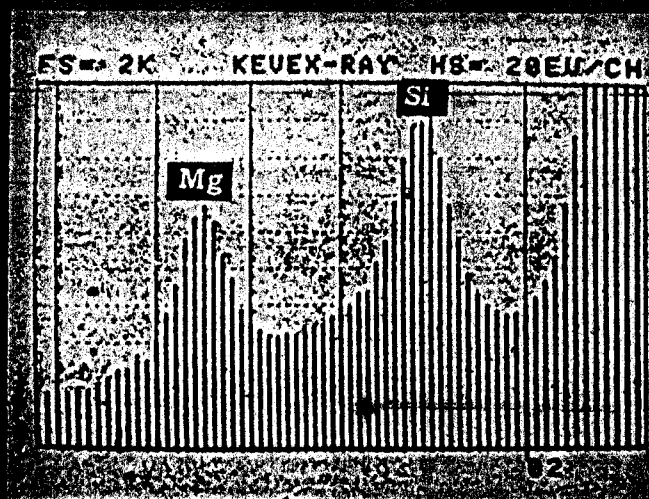
Method 3 or 3, 4 suitable for identification.

Method 5, 6 or 5, 6, 7 suitable for identification.

CRMC-MAD-000422



Scanning electron micrograph of chrysotile
fibrils from municipal water system.
Viewed directly on Nuclepore filter. 20,000X



Energy dispersive X-ray analysis of above
fibrils showing characteristic peaks of
Mg and Si.

05D2/6101C/JJT
9631
Ser 55

30 MAY 1979

From: Commander, Naval Sea Systems Command
To: Commander, Mare Island Naval Shipyard

Subj: Asbestos Content of Magnesium Silicate Raw Materials Used in Manu-
facture of MIL-P-24441 Epoxy Coatings

Ref: (a) NAVSEC Project Order N6519779PO90020

1. It is requested that Mare Island Naval Shipyard (NAVSHIPYD Mare)
evaluate magnesium silicate from:

R. T. Vanderbilt Co.	(Nytal 300)
Pfizer Co., Minerals & Pigments	(CP 20-30)
Cyprus Mistic	(139)
Desert Minerals Talc Co.	(Hy-Fine 80)

to determine asbestos fiber content.

2. Although tremolite is the major mineral fiber in asbestos, other min-
eral fibers are chrysolite, amosite, crocidolite, anthophyllite, and actino-
lite. These fibers are to be identified also and, if present, reported
along with tremolite.

3. The magnesium silicate pigments of paragraph one (1) shall also be
evaluated physically and chemically. In particular, oil absorption should
be determined and compared to the material used to make reformulated
MIL-P-24441 materials, i.e. Pfizer Cp 20-30 magnesium silicate.

The effort is within the scope of funding of reference (a).

A. T. ANDERSON
By direction

Blind copy to:
NAVSEA 05D23/6101E
534/6159C
921TH3



Prepared by: John J. Tock/05D21/6101C/20214
Typed by: L. Sandejo Hager/24 May 1979

CRMC-MAD-000424

B 109398

I. Revised 1975 Talc Forecast vs. Original Plan

Grade	1975 Original Plan		1975 Forecast As Of 4/1/75	
	Tons	\$	Tons	\$
Std. Grind				
DT-51	14,600	\$ 775,900	19,600	\$ 921,200
DT-54	1,150	64,400	1,150	64,400
DT-55	775	44,950	775	44,950
DT-84	400	22,400	400	22,400
D-H2	2,500	100,000	2,500	250,040
Fractionated				
Hi Press	2,500	107,500	2,500	105,000
Hi Fine 80	1,900	125,400	3,400	221,000
Micronized				
DT-57	3,100	285,200	1,600	144,000
DT-506	200	16,800	200	16,400
DT-507	650	64,350	650	61,750
DT-706	250	22,500	250	21,500
DT-707	750	72,000	750	69,000
Cyclonized				
Cyclo-Fil	5,000	485,000	2,500	235,000
Cyclo-Sorb	5,000	450,000	3,500	315,000
Clay				
PV #1	6,000	303,600	6,000	270,000
PV #3	800	40,000	800	37,600
Crude	3,000	69,000	1,200	120,023
TOTAL	49,175	\$3,049,000	47,775	\$2,919,263

II. Revised Sales and Net vs. Original Plan

Division _____

Date prepared _____

For _____ 197_____

	Original C Plan	%	Revised C Plan	%		%		%
GROSS SALES TO CUSTOMERS	3124		4/1/75					
TRANSPORTATION	45							
RETURNS								
DISCOUNTS								
ALLOWANCES	30							
SALES TO OTHER DIV.FOR USE								
NET SALES VALUE	3047		2919					
STD. COST SHIPPED	2194		1815					
EARNINGS AFTER STD.COST SHP.	855		1104					
NON-STD. PLANT COST OPERATING VOLUME	161							
TRANSFERRED - NET	5*							
TOTAL	156		536					
GROSS EARNINGS	699		568					
DISTRICT EXPENSE SALESMEN	62		60					
SALES OFFICE	88		80					
INTER-DIV. COMM.								
WAREHOUSES	17		16					
TOTAL	167		164					
EARNINGS AFTER DIST. EXP.	532		404					
GENERAL & ADMIN. EXPENSES								
DIVISION ADVERTISING	20		20					
RESEARCH	111		111					
TECH SERVICES	50		50					
ENG. & TECH. PROJECTS	30		30					
DIVISION ADMIN.	105		100					
TOTAL	316		311					
MISC. INCOME & *DEDUCT.*	15*		15*					
DIVISION OPERATING EARN.	201		78					
COMPANY ADMIN. & ADVERT.	156		150					
PRE-TAX EARNINGS	45		(72)					
INCOME TAXES	9		15					
NET EARNINGS	36		(57)					
*Estimated by R. K. Comann includes non-standard costs								

III. Influences

A. External

1. Labeling--During June of 1974 we discussed with various customers the possibility of labeling our talc products. This resulted in an immediate loss of some accounts. Letters were sent to our customers advising that the label would be affixed to our bags effective November 1, 1974. These letters were sent out in September of 1974. The results of the letter in September and the actual labeling November 1 caused a further loss of customers. Our estimate of lost business on an annual basis was approximately 30 percent of our tonnage and 40 percent of our dollar volume. Please refer to my attached letter to P. Kotin which shows this effect.

R. T. Vanderbilt and Pfizer (California talc) are not labeling. R. T. Vanderbilt is certifying their talcs are asbestos-free, but we have no knowledge that Pfizer is doing the same. We feel that Vanderbilt and Pfizer (California talc) will be required to label before the end of 1975.

The adverse publicity generated concerning asbestos and tremolite has been such that even if we could remove the asbestos label from our talc, it would be some extended period of time, possibly a year or more, before we could regain business lost to asbestos-free talcs.

2. OSHA and NIOSH--Jointly studying asbestos in talc. OSHA has requested NIOSH to study asbestos in commercial talc, and NIOSH is studying asbestos content of talc mines with MESA. NIOSH considers all particles of chrysotile and the amphiboles that have three-to-one aspect ratio and over 5 μ as asbestos fibers. We expect increased activity from state (particularly California) OSHA offices on our talc customers because of tremolite.
3. FDA--Does not appear to be a problem at the moment. Their position stated in the Federal Register March 14, 1975 withdraws their proposed ban of talc in food packaging. The proposed ban drew attention to asbestos in talc and we will have an uphill battle to get back market share we lost.

4. General Market Conditions--See Talc Sales attached

- a. Our ceramic and tile business remains relatively strong in spite of our problems.
- b. Paint is weak due to the economy and our tremolite/labeling problems.
- c. Our plastic business has all but disappeared due to the tremolite problem with the exception of Solo Cup which we started to sell in October of 1974. Solo remains strong but tremolite and the label are an ever present potential problem. Competition from Pfizer is fierce but we manage to hold on because Solo likes our product.
- d. Tremolite, the label, and quality, plus a poor business climate have combined to hurt our sales to the paper industry. Competitors from Montana talcs have been only too eager to point out to our customers that our talcs contain asbestos fiber. This is very rough competition, and coupled with the economy and quality problems, makes for difficult marketing conditions, to say the least.
- e. Price increases--We had planned a six percent price increase for talc on an annual basis. We have implemented a three percent (annual basis) increase and have met great customer resistance. It is doubtful that a six percent will be achieved in 1975. A decision to label by Vanderbilt and Pfizer could reduce the pressure on Desertalc and allow for selective price increases.

B. Internal Influences

1. Ore Quality and Control Related to F.P.S.--The problems with ore quality came about when we were forced to above ground mining. The lack of selective mining has caused virtually all of our problems concerning brightness and acid solubles. The Mining Division is formulating a mining plan which should be completed soon to alleviate this problem.

Problems encountered at the milling locations resulting in inability to meet F.P.S. stem primarily from the crude ore being shipped from Warm Springs. This, hopefully, will be corrected by the mining plan mentioned above. Other quality problems were caused by grinds being too coarse and poor plant management. Plans to train and adequately staff quality control personnel have been put into effect by Mining and Research. Plant management and supervision should

CRMC-MAD-000428

improve dramatically when the Mining Division implements their new organization plan for Desert Minerals on April 1, 1975.

IV. Action That We Plan to Minimize Unfortunate Influences

- A. Tremolite and the Label--We are and will continue to educate our customers on the necessity of proper dust control not only for asbestos fiber, but for all dust which is required by OSHA. Our industrial hygiene studies are very helpful in this respect. We believe and are attempting to convince the customers that they must clean up their plants and control dust to comply with OSHA regulations. By so doing, he eliminates the problem of asbestos.

Wherever possible, we discuss bulk shipments to avoid dust problems.

- B. Ore Quality--This problem is critical and compounds our problems with tremolite and the label. We are in constant contact with the Mining Division and communicating our problems in this regard. The formulation and implementation of a good sound mining program, properly supervised, will eliminate this problem area.
- C. Quality Control Problems at Grinding Locations--Good quality crude is paramount, as it is the one area that the grinding plants have no control over. The training of plant quality control personnel so they know what they are looking for and can interpret their results properly will alleviate the problems of coarse grind. This, with better plant management which should be accomplished with the new plant organization, should reduce these problems to a minimum. T. E. Remmers has been assigned the responsibility of the key marketing liaison person to work and communicate to the Mining Division and to follow problem areas through.

V. Recommendations

The initial crunch of lost business due to the label has been felt. Our business seems to have stabilized. We expect further erosion in paint and possibly the loss of Solo Cup in plastics. Our ceramic business remains strong. We believe we can regain some lost paper tonnage with improved quality from Warm Springs and the grinding locations.

During April we will phase out production from Los Angeles and move all production to Dunn. Some Cyclo-Fil may have to be made at Los Angeles on an intermittent basis due to capacities at Dunn. The consolidation of virtually all production at Dunn will cause Dunn to run at capacity for six-day weeks. The concentration of managerial personnel at Dunn should improve the plant's efficiency and eliminate

CRMC-MAD-000429

many quality, shipping, and outage problems we have been experiencing.

The costs used to arrive at net earnings with the revised forecast were submitted by the Mining Division. The cost includes the fixed cost for the Los Angeles Plant, which are estimated at \$200,000 per year while closed down. If we were to dispose of this plant the fixed cost would be eliminated. The cost of operating Dunn and Warm Springs, in my judgment, appear to be overstated. We have never operated Dunn at full capacity with full management capabilities which should insure better efficiency.

We believe we still have a 45,000-plus ton per year business. Mining Division believes this business concentrated at Dunn will improve our profitability. We would like to stay in the California talc business at least until Penhorwood comes on stream, to maintain continuity in the market. The Desert Minerals operation should be reviewed for profitability progress after May results are in.

If this business, with the changes contemplated over the next two months, can be made profitable, it will remain a good small business as Penhorwood should have virtually no effect on Desert Minerals.

CRMC-MAD-000430

Johns-Manville

Internal Correspondence

To: P. A. Martinson - 2W

Date: March 20, 1975

From: R. S. Lamar - 2W

Copies: J. M. Fletcher - 2S H. R. Keefe - 2W J. M. Sharratt - 2S

Subject: AN ASSESSMENT OF THE J-M POSITION WITH TALC

Three years since J-M's entry into the talc business with the acquisition of Desert Minerals Company is time enough for an appraisal of our position. This assessment is broken down into eight sections as follows:

1. The Effects of Labeling: Our position here has been the only acceptable action J-M could take. According to the definitions that are a part of the law, our California talc products all contain asbestos in the form of tremolite. No play on words will change this fact.

Originally, I had felt that if we could maintain the uniquely high brightness and relatively low acid soluble content of G-1 and G-2 talc ores, we could hold onto most of the critical markets, in spite of labeling. I now seriously doubt our ability to do this.

The "talc-asbestos" problem is quite different from the "asbestos-asbestos" problem. In many applications for asbestos, there are no acceptable substitutes. With our asbestos-containing talc, there are numerous possibilities for substitution:

(a) Non-asbestos containing talcs from both Pfizer and Cyprus from Montana sources and

(b) Other extender pigments such as kaolin and calcium carbonate (in paints, for example, and in paper filling uses).

We see this type of substitution being made and long-established markets for Desertalc products evaporating in the process.

CRMCMAD-000431

2. The R. T. Vanderbilt Position: Their position with respect to labeling must be deliberately perfidious; they cannot be this misinformed. Slim Thompson, their technical director, has a Ph.D. in mineralogy. At the moment, Vanderbilt is misleading their customers and confusing ours with their decision not to label. Ultimately, the truth will out, and they will be forced to label.

Pfizer's position is the same with their California talcs. With all asbestos-containing talcs labeled, far greater value and emphasis in the market will be applied to asbestos-free talcs. I seriously question the capacity of these asbestos-free talcs to satisfy the total market. Also, in some applications, the asbestos-free talcs are just not a suitable substitute quality-wise. For example, in ceramic wall tile (a major market for tremolitic talc) there are few, if any, asbestos-free talcs that show the same forming and firing properties. Penhorwood fires to a brown color due to high iron content. G-1 Fires white due to very low iron content.

Nevertheless, it is a fact that the Montana talc (asbestos-free) business of both Cyprus Industrial Minerals and Pfizer is booming, while we are in the doldrums.

3. Quality: Historically, talc mining has been a high-grading operation with selective mining required to maintain acceptable quality for various uses. This type of selective mining was done successfully for over 25 years at the Grantham Mine. Proper quality and uniformity of ore were seldom, if ever, problems and sizeable markets were built on this foundation of quality.

The unique high brightness of Cyclo-Fil (95% G.E.) was, in the past, properly maintained and a good and profitable market developed for this product in paper filling. With the brightness of current quality Cyclo-Fil dipping as low as 89%, there is no way we are going to maintain this business. Clays and other fillers at half the price of Cyclo-Fil can and are being used.

Other quality considerations relating to high acid soluble content and improper grind have caused an erosion of our paper industry business until virtually nothing remains.

4. Markets: At one time (less than three years ago) sizeable markets for Desertalc products existed in paper, paint, plastics, and ceramics. Both DT-51 and DT-57 were the most widely used fillers in 40% talc-filled polypropylene. We lost this business prior to labeling because of tremolite content. Many of our paint and paper accounts have been lost for the same reason and labeling has accelerated this loss. Labeling, plus the loss of proper quality, has been disastrous.

Ceramic sales of DT-51 have been difficult to maintain. High acid soluble and water soluble contents of G-1 ore have resulted in casting slip gelation and rheological problems. The high acid soluble content of current quality G-1 and G-2 ore has increased the alum demand of both Cyclo-Sorb and Cyclo-Fil in paper applications to the point where, even if we had proper brightness, a paper mill could not afford to use our products.

I can foresee no markets that can be built or rebuilt under present conditions.

5. New Technology: Froth flotation will reduce the tremolite content of G-2 ore to less than 1%, but will not remove all of the tremolite. In such a wet process, acid leaching will increase brightness several points. HIMS could probably also be used to remove even paramagnetic material to improve brightness still further.

Newly developed sand or attritor milling procedures can grind down to a maximum particle size of under 2 microns, but I believe that all of these new techniques are a waste of time as long as we have to label. Also, the relatively high mining costs at Warm Springs, plus the absence of adequate water for these wet processing methods makes the development of other sources more attractive.

6. Penhorwood: Based on detailed testing, we feel certain that Penhorwood talc can be developed as a major source for pitch control and should be directly competitive with Mistron Vapor (Cyprus Industrial Minerals Montana talc). Other markets may be developed for Penhorwood in plastics filling, elastomer reinforcement, and paint. Although in this latter use, the relatively low brightness of Penhorwood is going to be difficult to overcome. If higher brightness grades could be developed from the same mining area, additional markets would become available.

In paint uses, wet color uniformity is a major consideration and must be maintained with Penhorwood talc or any other extender pigment. Analyses of Penhorwood core samples suggest that this may become a major problem.

7. Other Worldwide Talc Sources: With the worldwide decline in the industrial use of tremolitic or asbestos-containing talcs, sources for asbestos-free talc will surely become more valuable. Major sources for this type of ore exist in France, Italy, Spain, India, Red China and other parts of the world. Generally, all of these deposits are selectively mined.

Only Finntalc and Johnson and Johnson are using froth flotation to separate talc products of acceptable quality. We will do the same at Penhorwood, and the industry must move in this direction as deposits amenable to high-grading are depleted.

Talc producing areas in California, Nevada, and Montana have been thoroughly--if not systematically and professionally explored. It is unlikely that new large-scale talc-mining properties could be developed. However, this possibility should be explored--but only for asbestos-free materials. There would appear to be an opportunity for good geological work.

8. Conclusions and Recommendations

- a. Labeling, plus a general decline in quality, has caused a disastrous loss in J-M talc business. Some of this business might be regained in spite of labeling, providing we could re-establish prior high quality standards in both our mining and milling of these products. However, the effects of labeling will always place us in a serious competitive position. The economic viability of such an operation is also highly questionable.
- b. Until Penhorwood is in operation, we should try to hold onto as much of our existing talc business as possible. Such a holding action will be difficult, expensive, and disheartening, but should be done. Penhorwood will not replace all existing markets for Grantham talc because of darker color and other differences.
- c. Beyond the development of Penhorwood, J-M should attempt to develop on a worldwide scale, other asbestos-free sources for talc mineral. These will most surely become more valuable with time.

It would be unfortunate, indeed, if we were to let our poor performance with Grantham talc interfere with J-M development of other worldwide talc sources under more desirable conditions.

R. S. 

Celite DHQ
January 23, 1973

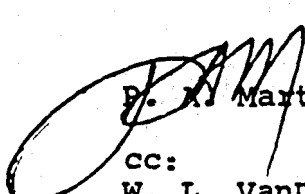
R. S. Lamar

TALC PRODUCERS' ASSOCIATION (PROPOSED)
R. T. Vanderbilt Company

In view of the developments at the recent meeting in New York City attended by you and Dr. Speil, it appears very much in order to go on record not only with the Vanderbilt people, but also others in the industry interested in OSHA, FDA and other matters of concern at this time.

Pursuant to our conversation last week in Denver, it is therefore suggested that you immediately propose a letter, which you indicated you would do, and send it to the writer. It is asked that you indicate to whom you feel this letter should be addressed, in accordance with the foregoing statement. Also, it is my suggestion that perhaps Jack Solon should initiate the letter and follow through. I am giving a copy of your January 18 letter to both Messrs. Solon and Dick Carter.

It is my strong feeling on this matter that Johns-Manville's position must be based on facts. I know on this you agree, and also, in general, others in the industry of necessity for the good of the industry, certainly must take the same position.



P. M. Martinson

cc:

W. L. VanDerbeek
F. J. Solon
H. R. Keefe
E. B. Smith
R. F. Bassett
W. C. Streib
~~R. P. Carter~~
J. M. Sharratt

d
c

CRMC-MAD-000436

PAM

INTER - OFFICE MEMORANDUM

TO : S. Speil DATE : January 18, 1973

FROM : R.S. Lamar

SUBJECT : Telephone conversation FOLLOW-UP : *[Signature]*

1/16/73 with William Ashton, Johnson & Johnson

As you know, we have been working with Bill Ashton on the possible joint development of Canadian Magnesite talc with J-M and J&J.

Bill probably knows as much about talc as anyone. He is very honest and quite outspoken sometimes in expressing his opinion. He is a great person!

Bill Ashton is very upset about what R.T. Vanderbilt Company is trying to do through the Talc Producer's Association, and more particularly, what they are attempting to do by having Alan Harvey made chairman of the A.S.T.M. sub-committee to re-define "asbestos". According to Ashton, they also hope to define "talc" through this same committee.. This is what has Ashton really upset!

I know that both you and I came away from our January 11, 1973 meeting at R.T. Vanderbilt Company, New York City not agreeing with their definition of "tremolite". They are playing with words and ignoring facts.

Ashton said today that they (Vanderbilt) plan to use this same A.S.T.M. committee to re-define talc as:

1. Pure talc mineral (never found in nature).
2. Commercial talc which is always associated with tremolite.

Both definitions are not true but are obviously aimed at strengthening Vanderbilt's marketing position. These are obvious and deliberate attempts by Vanderbilt to bend the truth.

We have seen numerous samples of natural pure talc mineral.

Many commerical talcs, even though they are not pure talc minerals, do not contain tremolite.

I do not believe that we should allow Vanderbilt to proceed unchallenged with this type of approach. It might be very worthwhile if you were to talk with Bill Ashton about all of this prior to the forthcoming Talc Producer's Association meeting on February 5, at R.T. Vanderbilt Company offices New York City.

CRMC-MAD-000437

It our very strong belief that J-M should not endorse something we know to be untrue even if it may help us in our present difficult position with respect to tremolite.

Sincerely,

R.S. Lamar

RSL:lk

cc: W.L. VanDerbeek
P.A. Martinson ✓
J.M. Sharratt
W.C. Streib
H.R. Keefe
E.B. Smith
R.F. Bassett
R.S. Lamar



Johns-Manville

Admission - Tel -
Internal Correspondence

To: F. J. Solon, Jr.

Date: Oct. 4, 1974

From: R. P. Carter

Copies: File & C

Subject: TREMOLITIC TALC

Bob Bacon called me this afternoon to advise me he had received a telephone call from Dan Boyd. Boyd indicated that he had been directed by John Stender to prepare a letter to R. T. Vanderbilt for Stender's signature, advising Vanderbilt that they can certify to their customers that Vanderbilt's talc (NYTAL) does not contain asbestos, provided the talc ore does not contain fibers in R. T. Vanderbilt's judgement. Boyd believes that the letter will be signed early next week.

Boyd indicated to Bacon that this decision was based on guidance from Jon May at NIOSH, who advised OSHA that the evidence currently is inconclusive as to whether tremolite is carcinogenic. Therefore, Vanderbilt should be granted some relief until NIOSH completes its investigation of tremolitic talc.

As soon as this letter is signed by Stender, Boyd agreed to call Bacon and read the contents of the letter to him. Bob Bacon, in turn, has agreed to call me as soon as he hears from Boyd and will immediately forward a copy of the letter to us.

If what Bob Bacon has reported is correct, I am at a loss to understand OSHA's rationale for such action. In the past, OSHA has not hesitated to regulate a substance even though there was little, if any, evidence to establish that a particular substance was harmful to man at certain exposure levels. If such a letter is in fact issued by Stender, then, in effect OSHA would be holding in abeyance the application of the asbestos definition in OSHA's asbestos standard with respect to tremolite.

I advised Bob Bacon that we were still planning to commence the insertion of warning labels on all commercial talc on or about November 1, and would not reconsider this decision until such time as we had an opportunity to review Stender's forthcoming letter.

CRMC-MAD-000439

F. J. Solon, Jr.

Page 2

Oct. 4, 1974

In the event we should decide to schedule a meeting with Howard Shulte, Dan Boyd and Alexander Reis, it might be advisable to first meet with Jon May at NIOSH to ascertain where they stand in their study of tremolitic talc and learn first-hand what his recommendation was to OSHA with respect to Vanderbilt's request. This background may be beneficial to us at a meeting with Shulte, Boyd and Reis.

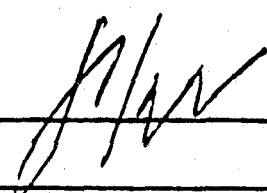
R. P. Carter

RPC/emr

CRMC-MAD-000440

PAM

INTER - OFFICE MEMORANDUM

TO : S. Speil DATE : January 18, 1973
FROM : R.S. Lamar
SUBJECT : Telephone conversation FOLLOW-UP : 
1/16/73 with William Ashton, Johnson & Johnson

As you know, we have been working with Bill Ashton on the possible joint development of Canadian Magnesite talc with J-M and J&J.

Bill probably knows as much about talc as anyone. He is very honest and quite outspoken sometimes in expressing his opinion. He is a great person!

Bill Ashton is very upset about what R.T. Vanderbilt Company is trying to do through the Talc Producer's Association, and more particularly, what they are attempting to do by having Alan Harvey made chairman of the A.S.T.M. sub-committee to re-define "asbestos". According to Ashton, they also hope to define "talc" through this same committee.. This is what has Ashton really upset!

I know that both you and I came away from our January 11, 1973 meeting at R.T. Vanderbilt Company, New York City not agreeing with their definition of "tremolite". They are playing with words and ignoring facts.

Ashton said today that they (Vanderbilt) plan to use this same A.S.T.M. committee to re-define talc as:

1. Pure talc mineral (never found in nature).
2. Commercial talc which is always associated with tremolite.

Both definitions are not true but are obviously aimed at strengthening Vanderbilt's marketing position. These are obvious and deliberate attempts by Vanderbilt to bend the truth.

We have seen numerous samples of natural pure talc mineral.

Many commercial talcs, even though they are not pure talc minerals, do not contain tremolite.

I do not believe that we should allow Vanderbilt to proceed unchallenged with this type of approach. It might be very worthwhile if you were to talk with Bill Ashton about all of this prior to the forthcoming Talc Producer's Association meeting on February 5, at R.T. Vanderbilt Company offices New York City.

CRMC-MAD-000441

It our very strong belief that J-M should not endorse something we know to be untrue even if it may help us in our present difficult position with respect to tremolite.

Sincerely,

R.S. Lamar

RS�:lk

cc: W.L. VanDerbeek
P.A. Martinson ✓
J.M. Sharratt
W.C. Streib
H.R. Keefe
E.B. Smith
R.F. Bassett
R.S. Lamar

CRMC-MAD-000442

Greenwood Plaza - 3 West
February 14, 1973

P. A. Martinson - 2 West

TALC PRODUCER'S ASSOCIATION (PROPOSED)
R. S. Lamar's letter of January 31, 1973

File-Talc

EJC	PCJ	SRM
TER	JEC	DM
T	ADM	KIB
DN	DM	LF

Dick Lamar's letter suggested that I comment on the technical soundness of the letter before it is sent. Before doing so, I would like to raise a question as to the desirability of sending such a letter out after attending the recent meeting of the Talc Producer's Association in New York City. While the intent of the meeting was to promulgate a series of definitions differentiating asbestos, tremolite, talc and commercial talc, I believe I was instrumental in changing the end result so that only one definition is being proposed, i.e., industrial talc.

While the exact wording may differ very slightly from the definition below, the general gist was as follows:

"Industrial talc is a product varying in mineral composition from the mineral talc $[Mg_6(Si_2O_{20})(OH)_4]$ to mixtures of mineral talc and other naturally associated non-fibrous and/or fibrous minerals as defined by ASTM Designation D2946-71.

While we should clear with the Vanderbilt people whether they intend to continue their previous plan to convince Government officials that tremolite is not an asbestos mineral, my own impression from the meeting is that they are convinced of the futility of this approach. The much more reasonable approach, and one which has some slight possibility of bearing fruit, is to concentrate on the definition of fiber. The ASTM definition referred to above uses an aspect ratio of 10:1 rather than the ACGIH ratio of 3:1.

R. T. Vanderbilt appears to be the spearhead for the whole effort to disassociate tremolite from the list of asbestos minerals. If they are not going to push this approach, then there is little need, in my opinion, for sending the letter to Talc Producers or to the Talc Producer's Association.

So much for the political aspects of the letter. With reference to the technical aspects, I should like to make the following points, some of which obviously will be minor.

CRMC-MAD-000443

February 14, 1973

Page 2

P. A. Martinson - 2 West

Item 2. While tremolite does have a fibrous "crystal habit" the particles can be fibrous or non-fibrous. In essence, a fiber is a particle with a defined minimum ratio of length to width. Unfortunately, this aspect ratio (L/D) is not a definitely established limit. As a matter of fact, in the ASTM definitions there are two ratios given as minimum. In the ASTM definition of asbestos minerals, the ratio is 10:1; in the Textile Fiber section, the limit is given as 100:1.

However, the more important aspect ratio limit, whether it has any more scientific significance or not, is that promulgated by the ACGIH, namely, an aspect ratio of 3. If the tremolite particles have an aspect ratio greater than 3:1, they are fibrous as far as OSHA is concerned. If the ratio is less than 3:1, the tremolite particle is a particle, not a fiber. Thus, although "tremolite is a fibrous mineral" as stated in Item 2, the individual particles may be fibrous or may not be fibrous, depending on their specific aspect ratios.

Starting with this distinction, we go to Item 1 which says that tremolite is clearly a member of the "asbestos family" of minerals. Again, this is correct, but since the asbestos minerals are fibrous by definition, then we could conclude that those particles of tremolite whose aspect ratio is extremely small are really not fibers and, therefore, they could be considered as not being asbestos.

What I am trying to point out is that whether tremolite is to be classed as an asbestos mineral is secondary to whether the particles are really fibrous or not insofar as the OSHA regulations are concerned, and we should try to pin our arguments on the aspect ratio factor.

Item 3. X-ray diffraction methods make possible a positive "differentiation between" both minerals. It will not definitely identify tremolite in a mixture containing small quantities of tremolite in a large concentration of talc. Strongest identifying X-ray lines for tremolite are essentially the same as those for anthophyllite and several other amphibole minerals.

The statement that pure talc mineral is fairly common in nature is something that I must defer to R. Lamar's knowledge. I had not anticipated that there were any large deposits of pure talc mineral without concomitant impurities, albeit non-fibrous impurities such as carbonates, oxides, etc.

CRMC-MAD-000444

February 14, 1973
Page 3

P. A. Martinson - 2 West

Item 8. While I am sure that our Industrial Hygienists can supply information regarding correct procedures for dust control and other protective measures that may be required, it will be a long time before sufficient medical or epidemiological data are available on which to pass any recommendations other than to include tremolite as either an asbestos fiber, in which case the fiber count limitations will be paramount, or as a nuisance dust in which particle count would be paramount.

Dick Lamar is to be congratulated on preparing a summation of this type which brings together at one point pertinent information of a technical nature.

S. SPEIL

SS/rs

cc:

W. L. VanDerbeek - 2 West
J. M. Sharratt - 2 West
H. R. Keefe - 2 West
W. C. Streib - 3 West
R. P. Carter - 5 West
R. S. Lamar - 1 North
E. B. Smith - Long Beach, Carson
R. F. Bassett - Long Beach, Carson

CRMC-MAD-000445

Greenwood Plaza - 1 North
January 31, 1973

EJE		RSL		RFB	
EBS	✓	NBS		SRM	
TER		JEC		DEN	
B J 13, .					
T		AJM		KJB	
RON		DHM		TJF	

P. A. Martinson - 2 West

YOUR MEMO OF JANUARY 23, 1973
TALC PRODUCER'S ASSOCIATION (PROPOSED)
R. T. VANDERBILT COMPANY

Attached is a proposed draft of a letter which is intended to indicate our (J-M) stand on this subject. We agree that this should probably go out over F. J. Solon's signature. We feel most strongly, however, that both S. Speil and W. C. Streib should approve of the technical soundness of the letter before it is sent.

We believe that the letter should go to the presidents of all of the talc producers in the United States, to the Talc Producer's Association, and to the appropriate A.S.T.M. Committee.

R. S. Lamar

R. S. Lamar

ain

cc:

W. L. Vanderbeek - 2 West
F. J. Solon - 1 West
H. R. Keefe - 2 West
E. B. Smith - Long Beach, Carson ✓
R. F. Bassett - Long Beach, Carson
S. Speil - 3 West
W. C. Streib - 3 West
R. P. Carter - 5 West
J. M. Sharratt - 2 West

CRMC-MAD-000446

O U T L I N E

ASBESTOS-CEMENT BACKGROUND PAPER

I. INTRODUCTION

- A) Brief History
- B) Uses
- C) Specs - P.H.S. - - W.H.O.

II. BACKGROUND TO HEALTH ISSUE

- A) Nashville accusation
- B) PHS inquiry

III. EVIDENCE SUPPORTING A/C PIPE

- A) Wright/Selikoff quotes
- B) Four types of supporting evidence:
 - 1. No unusually high GI cancer among asbestos workers
 - 2. No GI cancer in animal experiments
 - 3. Preliminary results of municipal water tests for asbestos content
 - 4. Decrease of GI cancer in U.S. and Europe

IV. ⁶¹⁰CONCLUSIONS

CRMCMAD-000447

DRAFT # 6 - MMS/WPR
April 9, 1968

ASBESTOS-CEMENT (A/C) WATER PIPE AND HUMAN HEALTH

Asbestos-cement (A/C) pipe for water supply and disposal systems was developed in Europe in 1913 and introduced into the United States in 1929. Asbestos fiber, added to Portland cement and silica, provides the structural strength required for durable, lightweight, rustproof, economical piping.

These advantages have led to the use of great quantities of A/C pipe, over the past half century, for water supply and sewer systems, irrigation projects, drainage systems, industrial processes, heating and cooling installations, gas systems, and as conduits for electrical and telephone wires.

For water supply systems, A/C pipe meets the specifications of the American Water Works Association and of the U. S. Government. Under Federal Specification SS-P-351A, A/C water pipe is sold to the U. S. Public Health Service. The World Health Organization uses large quantities of A/C pipe in its programs to improve the quantity and quality of water systems throughout the world.

Because of A/C pipe's unique advantages for community water systems, it is important to clarify a question raised, late in 1967, in Nashville, Tenn., concerning the suggestion of a possible health hazard related to the use of A/C pipe.

CRMC-MAD-000448

More

ORIGIN OF THE HEALTH ISSUE

In 1967 the metropolitan government of Nashville was considering a proposal to include A/C pipe in its specifications for water pipe.

On November 30, 1967, THE NASHVILLE BANNER, in a story on this proposal, reprinted a letter from Dr. James D. Snell, Jr., Assistant Professor of Medicine at Vanderbilt University, suggesting that it would be "a medical hazard of significant degree to use such pipe in a water system until the U. S. Public Health Service had checked it out completely ..."

Dr. Snell's letter stated that medical circles have established "fairly well" that asbestos causes a "high incidence of cancer in the lungs if breathed or in the gastrointestinal tract if swallowed, even in amounts small enough to be visible only under a microscope." He added that if any particles of asbestos were released from A/C pipe into a municipal water system, "current medical knowledge suggests that a rise in certain types of cancer could be expected in about 20-50 years among the population."

Dr. Snell offered no evidence in his letter to support his allegations. Later, when Nashville Councilman James LaPenna asked to see medical literature in support of this position, Dr. Snell submitted two papers which dealt solely with the problem of occupational exposure to the inhalation of asbestos fibers. Neither paper suggested any problem arising out of the swallowing of asbestos fiber by the general public.

Upon receiving Dr. Snell's letter, Nashville authorities turned to the U. S. Public Health Service for advice.

More

CRMC-MAD-000449

REACTION OF THE SCIENTISTS

The Public Health Service contacted two prominent medical authorities in the field of asbestos and health "to confirm our view that there is a low probability of any health hazard associated with this use of asbestos cement pipe."

The two experts were Dr. George W. Wright and Dr. Irving J. Selikoff, who are referred to by the PHS as "recognized authorities in the field."

Dr. Wright is Chairman of the Institute for Occupational and Environmental Health, and head of the Medical Research Department, St. Luke's Hospital, Cleveland, Ohio. Dr. Selikoff is professor and chairman, Division of Environmental Medicine, Mt. Sinai School of Medicine, New York City.

Briefly, the opinions of these two prominent authorities are as follows:

Dr Wright: "To my knowledge, there have been no reports in medical literature of any relationship between gastrointestinal cancer and the drinking of water supplied through an asbestos-cement pipe water system. Most assuredly, the ingestion of one or a hundred or a thousand asbestos fibers, on one or more instances, cannot be related to gastrointestinal cancer, since in asbestos workers exposed far more heavily five days a week, over a period of many years, there is no evidence of a higher than average frequency of GI cancer."

W. There is "no evidence at all at this time that the presumably very low level exposure by ingestion which might occur by intake of water supplied through asbestos-cement pipe has resulted in a recognized health hazard."

~~Dr. Irving J. Selikoff~~

EVIDENCE SUPPORTS COMMENTS BY DOCTORS

The comments of Dr. Wright and Dr. Selikoff are supported by four types of evidence:

1. Workers in certain asbestos-related trades have been exposed to heavy concentrations of asbestos dust on the job and have, as a result, swallowed considerable quantities of this material. Despite this exposure, they have not had ^{an} unusually high rate of gastrointestinal cancer.
2. The exposure of laboratory test animals to heavy concentrations of asbestos dust has resulted in no cases of gastrointestinal cancer.
3. Recent ~~preliminary~~ research indicates that no significant amounts of asbestos are released into drinking water which flows through A/C pipe.
4. The death rate from gastrointestinal cancer in the United States has shown a steady decline over the last 20 years. This national trend also applies, in general, to those cities

More

CRMC-MAD-000451

where A/C pipe has been used in water systems for long periods of time. Similarly, in most of the European countries where A/C pipe has been used extensively -- in many countries for more than half a century -- the death rate from this type of cancer has also declined.

These four points will now be discussed in further detail.

1. OCCUPATIONAL EXPOSURE TO ASBESTOS HAS NOT RESULTED IN ABNORMALLY HIGH GI CANCER RATE

Scientists are now investigating a possible relationship between heavy occupational exposure to inhaled asbestos dust and lung cancer; however, there is no evidence whatever to support the contention that the swallowing of asbestos fibers produces any disease.

Dr. Wright points out that insulation workers are "heavily exposed" to the ingestion of asbestos because a certain percentage of inhaled asbestos dust is coughed up and then swallowed. "I would reason from this, therefore, that in the insulation workers the gastrointestinal exposure to fiber would be high and therefore if there was a strong relationship of fiber ingestion to gastrointestinal cancer, it should not be difficult to demonstrate it." Dr. Wright declares, "there is no evidence to support the contention that even the highest intensity of exposures that we know of in industry leads to

More

CRMC-MAD-000452

clear-cut increased frequency of gastrointestinal cancer."

SUMMARY Studies made on workers exposed to a heavy concentration of asbestos dust do not support the allegation that the minute amounts of asbestos present in water would lead to increased GI cancer risks.

Selickoff research data to support that there is

2. ANIMAL EXPERIMENTS WITH ASBESTOS HAVE NOT PRODUCED
GI CANCER

who follows

Laboratory test animals are used extensively in cancer research to study their reactions to various substances that are suspected of having some relationship to cancer in humans. Tests of this nature, using asbestos, have been conducted on mice for periods as long as two years and on dogs for four or more years. The amount of fiber swallowed by these experimental animals far exceeds even that of insulation workers.

These animal tests have shown no relationship between fiber exposure and gastrointestinal cancer. In fact, there is no record of a tumor of any sort forming in the gastrointestinal tract of the test animals.

In addition, experiments conducted by Dr. Selikoff on hamsters generally support the dog-and-mice-feeding findings.

"Yet," Dr. Selikoff commented, "the exposure to ingested asbestos in this experimental work was very much larger indeed

more.....

CRMC-MAD-000453

than might be anticipated in water obtained from asbestos-cement pipes."

Single
SPACE

SUMMARY Animal experiments confirm the studies made of the health records of asbestos workers, which show no relationship between asbestos exposure, whether by inhalation or swallowing, and GI cancer.

3. MUNICIPAL WATER AND ASBESTOS

Even the so-called "pure" water distributed through municipal systems contains traces of many minerals and chemicals, the amount and type depending upon the source and location of water supplies. It would not be surprising, therefore, to find trace particles of asbestos in water supplied through almost any type of piping system.

A recent study showed that the water passing through two miles of 17-year-old A/C pipe, in San Diego, contained a mere 4 micrograms -- about one seven-millionths of an ounce -- of asbestos fiber per gallon. In terms of human consumption this means that if a man were to drink eight glasses of water per day, he might swallow a total of eighteen-ten-thousandths of an ounce (.0018) of asbestos in a lifetime of 70 years.

How does this compare with the exposure of a man working in an

More ...

CRMC-MAD-000454

asbestos plant? Under the accepted Threshold Limit Value (TLV) for asbestos inhalation in industry, in 45 years a worker would inhale 8,000 times more fiber than anyone could get from the drinking water in 70 years. What is relevant here is the fact that there is no increased frequency of GI cancer among asbestos workers, who cough up and swallow a substantial portion of the fiber they inhale.

Single Spec [SUMMARY Although additional research is being carried on, present evidence does not support the contention that A/C water pipe releases asbestos into water supplies in amounts than can constitute any health hazard to the general public.

4. DECREASE IN FREQUENCY OF GASTROINTESTINAL (GI) CANCER IN THE UNITED STATES

Figures from both the National Office of Vital Statistics of the United States Public Health Service and from the American Cancer Society show a steady decline in the frequency of GI cancer in the United States from 1947 to 1966. The death rate per 100,000 of population from GI cancer dropped from 55.2 in 1947 to 48.4 in 1966. Available U. S. figures also show GI cancer declining since 1960 as a percentage of total deaths:

More

CRMC-MAD-000455

Table I. Deaths from Selected Causes for the U.S.

<u>Year</u>	<u>Total Deaths All Causes</u>	<u>Deaths from GI Cancer</u>	<u>GI Cancer as % of All Deaths</u>
1960	1,711,982	91,035	5.3
1962	1,756,720	92,047	5.2
1964	1,798,061	93,158	5.1
1965	1,828,136	94,305	5.1

Similar trends can be found in cities all across the country.* Of special interest is the comparison between Nashville, Tenn., where no A/C pipe has been used and Knoxville, Tenn., where A/C pipe has been used since 1938. Here's how U.S. government figures apply to those two cities.

Table II. Nashville-Knoxville Comparisons

	<u>Nashville (no A/C pipe)</u>		<u>Knoxville (A/C pipe since 1938)</u>	
	<u>1960</u>	<u>1965</u>	<u>1960</u>	<u>1965</u>
Deaths from All Causes	3,675	3,704	3,038	3,256
Deaths from GI Cancer	129	166	131	133
GI Cancer Deaths as Percent of Total	3.5%	4.5%	4.3%	4.1%

CRMC-MAD-000456

Similarly, in Europe, where A/C pipe has been in use for fifty years or more, the death rate from GI cancer is generally downward. For example, in Switzerland, where the use of A/C pipe is the highest per capita of any Western European country, the death rate, per 100,000 of population, for GI cancer has dropped from 81.9 in 1951 to 63.9 in 1962, according to the latest figures available from the World Health Organization.

Thus, the actual frequency of gastrointestinal cancer in no way supports the allegation that the use of A/C water pipe can cause an increase in this type of disease. It is also interesting to note that during the very years that the use of A/C pipe has increased in the United States, the rate of GI cancer has declined, although no conclusion should be drawn from this comparison. On the other hand, it is clear that no causal connection is shown between A/C water pipe and GI cancer in human beings.

SUMMARY "Substantial amounts of asbestos fiber have been used in various ways from 1930 on in the United States, and one would anticipate that if this fiber was playing a role in the causation of gastrointestinal tumors, it might be expected to have led to an increase in tumors, rather than the observed decrease."

(Dr. George W. Wright)

SINGLE
SPACE

More

CRMC-MAD-000457

Move
to bottom
of preceding
page

*(In considering these figures, it is important to remember (a) that cities tend to have higher rates of cancer than rural areas, so some city figures will run higher than the U. S. average, and (b) that minor fluctuations from year to year in the percentage figures, whether up or down, are of little or no significance, especially if the numbers are small.)

CONCLUSIONS

Four types of evidence have been examined: (1) occupational exposure of workers to inhaled and swallowed asbestos dust particles; (2) results of experiments with test animals exposed to large quantities of asbestos particles (3) results of tests to determine the amount of asbestos in municipal water supplies and (4) the frequency of GI cancer in the U.S. and Europe, including those areas using A/C water pipe.

All of this evidence is against the allegation that the use of A/C water pipe has any influence on the development of GI cancer.

Finally, it is important to view Dr. Snell's concern about the health safety of A/C pipe in its proper perspective.

Asbestos is by no means alone in having the finger pointed toward it as a possible health hazard. Literally hundreds of substances -- as common and everyday as fuel oil, charcoal broiled steaks, iron rust and egg yokes are known or suspected of being cancer causing agents under certain experimental conditions.

CRMC-MAD-000458

More

The point is that nearly everything we use and create in our increasingly complex society has been suspected, by someone, of being a potential hazard.

To forego the many benefits of these products of modern technology -- simply on the basis of suspicions that are unsupported by medical evidence, would be a great and unwarranted disservice to the American public.

#

7/10/72 0
8:30

Telephone conversation with

Bob Bacon
Vanderbilt.

They are not going to label
all mines & mills regardless of location
(10 - 50 miles away) come under the
Bu of Mines.

United States is not going to
label.

R. T. VANDERBILT COMPANY, INC.

33 WINFIELD STREET

EAST NORWALK, CONNECTICUT 06855

CABLE ADDRESS
BILTVAN NEW YORK

December 13, 1972

Mr. Norman Scheffel
Vice President
Desert Minerals
P. O. Box 155
Yardley, Pennsylvania 19067

Dear Mr. Scheffel:

The attached information may be of interest to you in our continued efforts to differentiate between the physiological effects of talc and asbestos.

Very truly yours,

R. T. VANDERBILT COMPANY, INC.

Allan M. Harvey

Allan M. Harvey, Manager
Patent and Legal Liaison Department

AMH: sr

Attachment

CRMC-MAD-000461

Thank you for the data you supplied recently on dust disease studies. After gleaning over these studies I find no mention of the 1961 study with the unexposed blank on local people that was run. Perhaps there is no comparison made with this unexposed group because it does not reinforce Dr. Kleinfeld's point that he makes in each paper.

Practically speaking he makes a devastating case that the New York State talcs are responsible for an increased death rate due to cancer of the lungs and gastro-intestinal tract. However, there are many unanswered questions raised by his study that can be somewhat helpful to us.

1. Much of his "conclusive" evidence is based on the 221 talc miners studied in 1940 and on the follow-up of 32 of these workers in 1954. Thus the major portion of the defamatory data is based on the work experience of earlier talc companies, since our operation did not commence until 1947. If that talc of a reputedly fibrous nature very similar to asbestos did in fact contain small quantities of asbestos, it could accelerate the onset of fibrosis and cancer. In fact Kleinfeld in one place states that examination of lung tissues showed fibrotic stranding indistinguishable from asbestos.
2. The levels of dust exposure indicated in those studies are extremely high and almost never found today where modern dust collection practices are in force. Many of the "Medium" exposure levels listed for the period before 1945 are absolutely intolerable today. Thus a study of the incidence of lung cancer occurrence in employees under today's exposure could be expected to be substantially less. Kleinfeld in fact recognizes this fact at one point (P665 Mortality Among etc.).
3. On P667 of Mortality Among Talc Miners, Kleinfeld makes an interesting and puzzling observation that the average age at death of the 91 talc workers followed in the study was 60.4 years where according to the national average it should have been only 54.4 years. In other words in spite of the dust exposure and the eventual death by cancer of the lungs or gastro-intestinal tract the group of talc workers on the average lived 6 years longer than the average American male born at the same time! Thus it becomes somewhat questionable whether the talc exposure actually shortened their lives. In any event Kleinfeld's data would indicate less than half the mortality rate for talc as compared to asbestos which is a very good point for a different TLV for talc.
4. While the incidence of death by cancer from talc exposure is reputed to be 4 times that of the "control population" we find no mention of

Talcosis vs. Asbestosis

what that population is and are left to assume that it is the U. S. population in general. This approach ignores our local background which is replete with cases of lung infection due to dairy farm dust exposure according to many medical authorities.

In summary the results of Kleinfeld's work published in the Mortality Among Talc Miners etc. would indicate that prolonged exposure to very high levels of talc dust will produce cancer deaths at an indicated rate of 4 times the 1965 national average. The data would indicate that the percentages of cancer deaths are less than one half those caused by similar asbestos exposure and therefore a TLV of at least twice that of asbestos should be tolerable. More modern data and comparisons with the local population should have been made but have been neglected, thus the talc industry is being singled out for what happened prior to 1940 rather than what it is doing today.

r

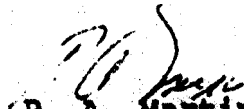
CRMC-MAD-000463

4/ 111
- 6.
Celite DHQ
September 5, 1972

H. M. Jackson

OSHA - TALC

Attached is copy of R. C. Bacon's (R. T. Vanderbilt)
letter of August 17, 1972, which is self-explanatory.


P. A. Martinson

attachment

cc:

W. L. VanDerbeek
R. P. Carter
F. D. Richards
T. M. Jackson
H. R. Keefe
D
C

CRMC-MAD-000464

R. T. VANDERBILT COMPANY, INC.
33 WINFIELD STREET
EAST NORWALK, CONNECTICUT 06855

CABLE ADDRESS
BILTVAN NEW YORK

AUG 21 1972

August 17, 1972

JG/1

Mr. William B. Reitze
Johns-Manville Corporation
5680 South Syracuse Circle
Denver, Colorado 80110

Dear Bill:

Enclosed are copies of two form letters which we will use for certain of our customers regarding the tremo-lite situation. You may find these of help.

Sincerely yours,

RCB

R. C. Bacon, Director
Research & Development Division

RCB:mjh

Enclosures

*Enc. 1 This is the info from Vanderbilt
O'Dell*

CRMC-MAD-000465

REPLY TO CUSTOMER INQUIRY RE THE EFFECT OF
THE ILLINOIS POLLUTION CONTROL BOARD'S REGULATIONS FOR ASBESTOS DUST
ON THE USE OF VANDERBILT TALCS

In answer to your letter of _____, we have determined that about one-third of our NYTAL talc consists of the mineral tremolite. Although the overwhelming percentage of tremolite in our product is of the non-fibrous type, particles can be found whose length to breadth ratio is 3 to 1 or greater, thus putting them into the category of a fiber as defined by the Illinois Standard. 6. 1 1)

Since our NYTAL ores are not mined or used as asbestos, we take issue with the Illinois Pollution Control Board, both in the definition of an asbestos fiber and the inclusion of tremolite per se as asbestos. At present, it is our belief that the existence of tremolite in our product does not constitute a mineral dust exposure hazard greater than that of non-asbestiform talc. Furthermore, although an exact determination has not been made, we believe that the content of so-called "fibers" in our product is low enough to present little or no inconvenience to the user in complying with the Illinois Standard limit for ambient air of two fibers per cubic centimeter of air.

8/15/72

CRMC-MAD-000466

ASTM COMMITTEE E-34
TASK GROUP ON NATURALLY OCCURRING INORGANIC FIBERS

A. Winer, Chairman
Mines Branch, Canada

E. M. Fenner, Vice Chairman
Johns-Manville

W. H. Ashton
Johnson & Johnson

A. M. Harvey
R. T. Vanderbilt

C. S. Thompson
R. T. Vanderbilt

G. Foy
Quebec Department of Natural Resources

M. Grimard, M.D., PhD
Department of Health and Welfare of Canada

P. V. Pelnar, M.D.
Institute for Occupational & Environmental Health

J. LePoutre, M.D.
Belgium Eternit

G. Gagnon
Lake Asbestos

P. C. Cooling
Asbestos Corporation

R. H. Mereness
Asbestos Information Association

P. A. Filteau
Quebec Asbestos Mining Association

T. D. Oulton
Engelhart Minerals

M. Cosette, Secretary
Quebec Asbestos Mining Association

M. LaChance
Quebec Asbestos Mining Association



Johns-Manville

Internal Correspondence

To: J. H. Swensen

Date: April 22, 1976

From: R. S. Lamar

Copies: P. Kotin, E. M. Fenner, R. P. Carter, H. R. Keefe,
H. Kranich, D, C

Subject: REPRINT OF PAPER: "MORTALITY STUDY OF
TALC MINERS AND MILLERS" BY GIOVANNI F. RUBINO, ET. AL.
FROM THE JOURNAL OF OCCUPATIONAL MEDICINE, MARCH, 1976
VOL. 18, NO. 3, pp. 186 - 193

The attached reprint was sent to us from our good friend
W. H. Ashton, Johnson & Johnson Co.

There are several key points:

- (1) The studies of Kleinfeld, et. al. of New York state "talc" workers show that the incidence of carcinoma of the lung and pleura among these workers is about four times that of the general population.
- (2) These New York "talcs" are known to contain not only the mineral talc but also other silicates such as serpentine, tremolite, and anthophyllite. In this respect Kleinfeld's findings are misleading since the effects of exposure to talc mineral are not defined.
- (3) Rubino's studies, conducted among talc workers at Val Chisone, Italy, are far more definitive regarding exposure to pure talc mineral since these products contain at most only trace amounts of tremolite and chrysotile.
- (4) Rubino concludes from his studies that there is no cancerogenic effect attributable to pure talc (mineral).

It would be my recommendation that this information be used in our marketing efforts with Penhorwood. It would appear that Vanderbilt's problems are multiplying (not to mention our own with Desertalc).

R. S. Lamar

CRMC-MAD-000468



Johns-Manville

Internal Correspondence

To: H. R. Keefe - 2W

Date: January 7, 1975

From: R. S. Lamar

Copies: See end of correspondence

Subject: YOUR MEMO OF JANUARY 2, 1975 TO
P. KOTIN, " TALC AND ASBESTOS "

I cannot help but feel that some additional input from Research is needed here. Several points:

1. The National Paint and Coating Association is simply a trade organization. It carries no legal weight. We are still bound by the law as described in OSHA documents. It seems to me that Stender, in his letter of October 9, 1974, destroys his own organization. Until this confusion within OSHA is resolved, we have no choice but to comply with the law as written.
2. As I read the NP&CA Bulletin No. 20, I get two strong impressions:
 - a. Rather than clarifying the matter, as stated, they only add to my confusion.
 - b. Asbestos is not really asbestos, but it can be anything you want to call it, e.g., "commercial talc."
3. I am greatly concerned with the point raised by A. Finkbinder at our last meeting. This has to do specifically with the fact that we are "sitting" on information which shows quite conclusively that R. T. Vanderbilt's talc products contain not only tremolite, but significant amounts of chrysotile and anthophyllite as well. What might be J-M's legal responsibility by withholding such information?
Refer to:

CRMC-MAD-000469



January 7, 1975

Memo October 9, 1974 V. E. Wolkodoff to R. S. Lamar

Report No. 414-T-33, October 4, 1974

Memo October 10, 1974 K. L. Jaunarajs to R. S. Lamar

Memo October 23, 1974 V. E. Wolkodoff to R. S. Lamar

Memo October 11, 1974 R. S. Lamar to V. E. Wolkodoff

Do we still intend to provide OSHA with this information on Vanderbilt's talc products? I also feel that we should provide this information to R. T. Vanderbilt.

4. Finally, the real question is medical in nature. From information I have from Kotin and Fenner, there is more than ample reason why we should label regardless of what the law might say. And, this could in time have a great deal to do with J-M's legal as well as its moral obligations.

I guess what I am really trying to say, Harry, is that the decision to label was right and should not be subject for reconsideration. We have to learn to live with it in a business sense regardless of how difficult this appears.



R. S. Lamar

kjm
attachment

cc:

P. Kotin - 4N
F. J. Solon - 4N
E. M. Fenner - 4N
A. C. Finkbiner - 5W
P. A. Martinson - 2W
H. Kranich - 2W
W. C. Streib
File: 259-6.1

Delaware
Not
Sensitive



Johns-Manville

Internal Correspondence

To: P. Kotin

Date: January 2, 1975

From: H. R. Keefe

Copies: Listed Below

Subject: Talc and Asbestos

Attached is a letter we recently received from the National Paint and Coating Association. This letter has been sent to all members of this Association.

Please note Page 3 under Recommendations. We feel quite confident that R. T. Vanderbilt Company will certify that their talc does not contain asbestos per this paragraph.

A speedy resolution of the confusion caused by OSHA and their definition of a fiber is necessary so that we might have answers concerning our talc for our customers.

Harry R. Keefe

HRK:ccr

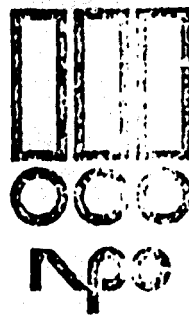
Attachment

cc: P. A. Martinson
H. Kranich
A. C. F. Finkbiner
F. J. Solon
R. S. Lamar ✓
E. M. Fenner
D/C

*Memo to H.R. Keefe
1/6/75
RSC.*

Safety & Health

Bulletin



NATIONAL
PAINT &
COATINGS
ASSOCIATION

1500
Rhode Island
Avenue, N.W.
Washington, D.C.
20005

Telephone
202 462-6272

No. 20
December 5, 1974

ROUTE TO:
Department

Finance		
Administration		
Sales		
Technical		
Production		

TALC AND THE OSHA ASBESTOS STANDARD 1910.93a

Executive Synopsis

The OSHA Asbestos Regulation 1910.93a includes, in its definition of asbestos, a mineral form (tremolite) that is found in some talcs, but is not generally considered an asbestiform material (see Safety and Health Bulletin No. 15, "Asbestos Handling Guidelines" dated October 30, 1973). Through the extensive efforts of several NPCA members, a clarification of the regulation was obtained from OSHA. This now allows talc manufacturers to certify their material is "asbestos free" and the user of that talc is then exempt from regulation under 1910.93a.

ACTION REQUIRED BY YOU - Forward this Bulletin to the person or persons responsible for your safety and health operations.

ACTION TAKEN BY NPCA - Through the efforts of NPCA members and the Occupational Health Task Force a clarification of the standard was accomplished.

OPERATIONS AFFECTED IN YOUR COMPANY - Manufacturing, safety and health.

STAFF CONTACT AT NPCA - Richard W. Murry, Assistant Technical Director

CRMC-MAD-000472

BACKGROUND

With the promulgation of the asbestos Standard 1910.93a in July 1972 the possibility of certain talc materials being regulated as asbestos was created. According to the regulation, asbestos is defined as the following mineral forms: chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite. While some talcs are indeed marketed as containing asbestiform minerals and noted for their fibrous properties, the standard also encompassed other talcs not previously considered to be fibrous or considered to contain asbestiform materials. These are the tremolite (or more correctly non-asbestiform tremolite) containing talcs.

Since late 1972 the R. T. Vanderbilt Company Inc. and the International Talc Company (later purchased by Vanderbilt) have had numerous meetings with OSHA officials to obtain a clarification on the regulation of the talcs under 1910.93a.

RECENT DEVELOPMENTS

On October 9, 1974 in a letter to Mr. H. B. Vanderbilt, President of R. T. Vanderbilt Company, Inc., Mr. John Stender, Assistant Secretary of Labor, stated in part:

"...if you (the talc manufacturer) have scientific evidence that the naturally occurring talcs, prior to processing by milling or crushing, do not contain fibrous or asbestiform tremolite, anthophyllite, actinolite or other asbestiform minerals, you may certify to your customers that the talc does not contain asbestos." (A copy of the letter is attached to this bulletin.)

Also a directive to such effect has been issued to OSHA field personnel as a guide in making inspections. This directive indicates that if a talc user, i.e., a paint and coatings manufacturer, is monitored for asbestos the person behind the microscope counting fibers should use the following identification criteria:

- A. Particles must appear to be fibrous rather than as crystals or slivers.
- B. The maximum diameter of a fiber to be counted is 3 microns.
- C. The maximum length of a fiber to be counted is 30 microns.
- D. The length to width ratio must be 5 or more to 1, that is, 5 times or more longer than wide.
- E. The separate or individual fibers must contain fibrils or the "bundle of sticks" effect, unless they are at a nondivisible stage. A fibril cannot be subdivided and would be counted, if it meets the other criteria. The electron microscope may be used to prove the fibrous nature of the particles. The length to width ratio of 5 or more to 1 is not meant to imply that other particles are not hazardous.

Page 3

The directive further states that if the talc is of the non-asbestiform or non-fibrous variety the time weighted average (TWA) of 20 millions of particles per cubic foot of air (mppcf) will be used.

If monitoring of your operations using talc is done by the OSHA inspector you should retain a sample of the talc material being used in the event a discrepancy may arise.

RECOMMENDATION

If you have been using talc products that have been questionable regarding asbestos content, request certification from the manufacturer that they do not contain asbestos. |||

Retain this certification to show to an OSHA inspector if he questions the asbestos content of the talc. If it is however determined that a talc does contain true asbestiform minerals, that material will not be certified and is subject to the provisions of the regulation.

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
WASHINGTON, D.C. 20210



Office of the Assistant Secretary

OCT 9 1974

Mr. H. B. Vanderbilt
President
Chief Executive Officer
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 08855

Dear Mr. Vanderbilt:

This is in reply to your letter of September 26, concerning your request for relief from the asbestos standard for your talcs containing non-fibrous tremolite, actinolite, and anthophyllite.

My letter of August 6 stated that non-fibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the asbestos standard and, therefore, the provisions of that standard do not apply to talc containing non-asbestiform minerals.

NIOSH is currently conducting a thorough investigation into the exact minerals to which talc workers were exposed in those studies where asbestosis or other adverse medical effects were found.

Pending the receipt and evaluation by OSHA of the report by NIOSH on this investigation, if you have scientific evidence that the naturally occurring talcs, prior to processing by milling or crushing, do not contain fibrous or asbestiform tremolite, anthophyllite, actinolite or other asbestiform minerals, you may certify to your customers that the talc does not contain asbestos.

Fibrous, asbestiform minerals such as fibrous tremolite means naturally occurring asbestiform minerals which prior to or after crushing and processing, contain fibers made up of fibrils.

Sincerely,

A handwritten signature in dark ink, appearing to read "John H. Stender", is written over the typed name.

John H. Stender
Assistant Secretary of Labor

CRMC-MAD-000475



Johns-Manville

Internal Correspondence

To: P. Kotin, M.D.

Date: April 8, 1975

W. P. Carter

Copies: File & Chrono

Subject: MONTHLY ACTIVITY REPORT
DIRECTOR, GOVERNMENT AFFAIRS
MARCH, 1975

FDA REGULATION OF GLASS FIBER FILTERS

The Food and Drug Administration promulgated a regulation restricting the use of glass fiber filters in the manufacture of parenteral drugs. Met with J-M's Washington law firm to prepare a notice contesting this regulation. Met with various FDA officials to ascertain why this regulation was promulgated.

PVC PIPE MIGRATION STUDIES

Prepared and sent letters to both EPA and FDA reporting the results of Phase II of J-M's PVC pipe (VCM migration) studies. Met with EPA and FDA officials along with Randy Prust of R&D to review our test results. No objections were received from either agency as to J-M's test procedures or results. EPA has agreed to conduct field studies in communities supplied drinking water through PVC pipe.

UNI-BELL BOARD OF DIRECTORS MEETING

Delivered a presentation to the Board of Directors of Uni-Bell on J-M's PVC pipe migration studies and a prognosis of actions by EPA and FDA on PVC pipe. The member companies of Uni-Bell agreed to supply necessary data to EPA for PVC pipe field studies.

FEDERAL TRADE COMMISSION - TALC LABELING

Met with two members of the FTC staff along with Aaron Finkbine to discuss the possibility of the FTC bringing suit against R. T. Vanderbilt Company for false certification of their talc.

FDA REGULATION OF TALC CONTAINING ASBESTOS

As a result of studies conducted by J-M, the FDA published a notice in the Federal Register withdrawing its proposed regulation restricting the use of talc containing asbestos in food and drug packaging paper and paperboard.

CRMC-MAD-000476



Johns-Manville

Specimen Sample
Internal Correspondence

To: V. E. Wolkodoff

Date October 11, 1974

From: R. S. Lamar

Copies: See end of correspondence

Subject: YOUR MEMO OF OCTOBER 9, 1974

OPTICAL AND TEM COUNTING OF ASBESTOS MINERALS IN
ASBESTINE 3X, ASBESTINE 325, NYTAL 200, AND NYTAL 400
AS CURRENTLY PRODUCED BY R. T. VANDERBILT CO.

Thank you Vlad for your very fine report covering your microscopic examination of these samples. Your data confirm analyses we have had made on these same samples by J. P. McCourty using X-ray diffraction techniques (Report No. 414-T-33) and by K. Jaunarajs using differential thermal analysis - primarily for the detection of serpentine mineral.

These present samples are really no different from previous samples of Nytal and Asbestine that I have examined periodically over the years. They all contain very substantial amounts of both tremolite and chrysotile and in two cases substantial amounts of a third asbestos mineral, anthophyllite.

In numerous discussions I have had with R. T. Vanderbilt people, they have readily admitted to having tremolite ("which is not an asbestos mineral and is not fibrous"), but they have never admitted to the presence of either chrysotile or anthophyllite. They do admit that years ago, when they were deliberately mining certain sections of their deposits for fiber, some of their products did contain chrysotile. This product, "Mouldene," was sold as a direct replacement for asbestos in the manufacture of vinyl tile. I have examined "Mouldene" in the past and it was in fact almost entirely chrysotile. "Mouldene" is no longer being made, but all of the International Talc Company and R. T. Vanderbilt Company talc products always have and continue to contain chrysotile as a significant mineral component (in addition to tremolite and anthophyllite).

CRMC-MAD-000477

October 11, 1974

It is apparent that the R. T. Vanderbilt presentations to OSHA, NIOSH, FDA, MESA, etc. are based on something less than the truth. I find it difficult to believe that they could be so grossly misinformed as to what their materials really are.

How this information is ultimately used is something that will have to be decided at higher levels within J-M. However, it is my belief that R. T. Vanderbilt, with a continuance of their present methods, does nothing but confuse the issue among the talc producers and with the various Federal agencies involved. Any properly informed person would know that they are wrong.

R. S. Lamar

R. S. Lamar

kjm

cc:

R. P. Carter	- 4N	F. L. Pundsack
E. M. Fenner	- 4N	W. C. Streib
P. Kotin	- 4N	J. P. Leineweber
W. B. Reitze	- 4N	S. Speil
F. J. Solon, Jr.	- 4N	A. J. McArthur
G. L. Swallow	- 4N	
A. C. F. Finkbiner, III	- 5W	
J. A. McKinney	- 5W	
H. R. Keefe	- 2W	
P. A. Martinson	- 2W	
C. J. Sulewski	- 2W	
W. L. VanDerbeek	- 2S	
R. G. Riede	- 2S	

File 414-C R. T. Vanderbilt

CRMC-MAD-000478

... distributed as another
membership service by the
American Mining Congress

STATUS REPORT

DEVELOPMENT OF ASBESTOS STANDARD FOR THE PRODUCTION AND USE OF CRUSHED STONE

APRIL 7, 1978

BACKGROUND¹

By now, most people on the East Coast and many people throughout the United States know that the United States Environmental Protection Agency (EPA) was apprised that crushed stone from the Rockville Crushed Stone, Incorporated, quarry contains asbestos and that the use of that crushed stone in an unbound form on roadways resulted in elevated levels of airborne asbestos near those roadways. Seven years ago, the National Academy of Sciences, following the lead of many other medical experts, concluded that exposure to airborne asbestos fibers is directly related to human diseases such as pulmonary fibrosis, carcinoma, and pleural mesothelioma. Thus, EPA, in conjunction with the Montgomery County Department of Environmental Protection and the Maryland Bureau of Air

CRMC-MAD-000479

QUALITY CONTROL, CONDUCTED A DETAILED INVESTIGATION OF THE ROCKVILLE SITUATION. SAMPLES COLLECTED IN AN EPA AND MONTGOMERY COUNTY DEP COOPERATIVE STUDY AND ANALYZED BY EPA CONFIRMED THAT ELEVATED LEVELS OF AIRBORNE ASBESTOS CAN OCCUR FOR SOME UNBOUND USES OF THE CRUSHED STONE. SOME OF THE RESULTS WERE SO HIGH THAT THE EPA HEALTH EFFECTS RESEARCH LABORATORY CONCLUDED THAT THE "CONCENTRATIONS" ARE SUFFICIENT TO CAUSE GRAVE CONCERN FOR THE HEALTH OF PEOPLE THUS EXPOSED" AND RECOMMENDED THAT "MEASURES BE INSTITUTED IMMEDIATELY TO REDUCE THESE CONCENTRATIONS OF AIRBORNE ASBESTOS AS MUCH AND AS RAPIDLY AS IS TECHNICALLY FEASIBLE."² ACCORDINGLY, ON JUNE 6, 1977, EPA FORMALLY RECOMMENDED THAT THE MONTGOMERY COUNTY EXECUTIVE IMPLEMENT SEVERAL SPECIFIED INTERIM AND PERMANENT ACTIONS TO PREVENT OR REDUCE THE EXPOSURE TO ASBESTOS.³ SUCH ACTIONS HAVE BEEN IMPLEMENTED IN MONTGOMERY COUNTY AND THE MARYLAND BUREAU OF AIR QUALITY IS PROPOSING REGULATIONS TO APPLY TO THE ENTIRE STATE. OTHER QUARRIES ARE EXPECTED TO PRODUCE ASBESTOS-CONTAINING CRUSHED STONE. EPA HAS INITIATED A PROGRAM TO DETERMINE THE EXTENT AND TO DEVELOP A FEDERAL STANDARD IF NECESSARY TO SUPPLEMENT STATE REGULATIONS.

ADVANCE NOTICE

AS STATED IN THE NOVEMBER 10, 1977, ADVANCE NOTICE OF PROPOSED RULEMAKING (42FR58543), THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY IS STUDYING THE CRUSHED STONE INDUSTRY TO DETERMINE THE EXTENT TO WHICH QUARRYING OPERATIONS ARE BEING CONDUCTED IN AREAS CONTAINING SERPENTINITE ROCK DEPOSITS, THE ASBESTOS CONTENT OF THE ROCK BEING MINED, AND WHETHER

THE PUBLIC IS BEING EXPOSED TO ASBESTOS FROM VARIOUS USES OF THE ROCK.⁴ THE ADVANCE NOTICE INCLUDED A BRIEF SUMMARY OF THE DATA AND THE ACTIONS TAKEN MONTGOMERY COUNTY. ALL INTERESTED PERSONS WERE ASKED TO SUBMIT ADDITIONAL INFORMATION BY JANUARY 10, 1978.

ONLY FIVE COMMENTATORS RESPONDED: ASARCO, INCORPORATED; R. T. VANDERBILT COMPANY, INCORPORATED; JOHNS-ILANVILLE SALES CORPORATION; THE NATIONAL CRUSHED STONE ASSOCIATION; AND VENABLE, BAETJER AND HOWARD (REPRESENTING ROCKVILLE CRUSHED STONE, INCORPORATED; THE ARUNDEL CORPORATION, D. M. STOLZFUS AND SON, INCORPORATED; AND BLUE MOUNT CRUSHED STONE, INCORPORATED). EACH OF THE FIVE COMMENTATORS STATED EITHER THAT A NATIONAL EMISSION STANDARD WAS NOT JUSTIFIED OR THAT A WELL-DEFINED ASBESTOS HEALTH EFFECTS THRESHOLD SHOULD BE ESTABLISHED BEFORE AN EMISSION STANDARD IS DEVELOPED. NO NEW DATA WERE SUBMITTED IN RESPONSE TO THE ADVANCE NOTICE. INFORMAL COMMENTS BY ENVIRONMENTALISTS WHO HAD PREVIOUSLY URGED EPA TO PROPOSE A STANDARD AS SOON AS POSSIBLE REITERATED THEIR POSITION THAT THE DATA WERE SUFFICIENT TO DEMONSTRATE THE NEED FOR A STANDARD.

OTHER THAN THE HEALTH EFFECTS COMMENTS, THE MOST SIGNIFICANT COMMENTS WERE THOSE THAT QUESTIONED THE ACCURACY AND PRECISION OF THE AIRBORNE ASBESTOS DATA. OF COURSE, EPA HAS BEEN AWARE FOR SOME TIME THAT ASBESTOS ANALYSIS RESULTS HAVE A LARGE VARIANCE WHEN DIFFERENT METHODS ARE USED BY DIFFERENT LABORATORIES. FOR THAT REASON, THE EPA OFFICE OF RESEARCH AND DEVELOPMENT (ORD) HAS EXPENDED CONSIDERABLE EFFORT OVER THE LAST THREE YEARS IN DEVELOPING A STANDARDIZED, DETAILED PROCEDURE FOR ELECTRON

MICROSCOPE MEASUREMENT OF AIRBORNE ASBESTOS CONCENTRATIONS. A PROVISIONAL METHODOLOGY MANUAL (EPA-600/2-77-178) WAS PUBLISHED IN AUGUST, 1977, AND IS CURRENTLY UNDERGOING DETAILED REVIEW BY ORD AND THE ASBESTOS ANALYSIS COMMUNITY. THE OFFICE OF RESEARCH AND DEVELOPMENT WAS RECENTLY ASKED TO PREPARE AN ASSESSMENT OF THE STATUS OF DEVELOPMENT OF AN ASBESTOS ANALYSIS PROCEDURE. THE PROVISIONAL METHOD IS EXPECTED TO BE CONFIRMED AS THE INTERIM PROCEDURE THIS MONTH.

QUARRY IDENTIFICATION

LAST SUMMER, THE ENVIRONMENTAL PROTECTION AGENCY REQUESTED THE ASSISTANCE OF THE BUREAU OF MINES (BOM), THE UNITED STATES GEOLOGICAL SURVEY (USGS), AND THE MINING ENFORCEMENT AND SAFETY ADMINISTRATION (MESA) TO DETERMINE THE EXTENT TO WHICH QUARRYING OPERATIONS ARE BEING CONDUCTED IN ASBESTOS-CONTAINING ROCK. MESA IS CONDUCTING A LONG-TERM STUDY TO DETERMINE WHICH MINING OPERATIONS EXCEED THE MESA WORKER EXPOSURE STANDARD OF FIVE ASBESTOS FIBERS PER CUBIC CENTIMETER OF AIR. THE MESA STUDY IS AN INVESTIGATION OF ALL MINING OPERATIONS IN AREAS OF METAMORPHIC ROCK. SINCE THE MESA STUDY ENTAILS AN INVESTIGATION OF SEVERAL THOUSAND MINES, INCLUDING 1574 ROCK QUARRIES, CONSIDERABLE TIME AND EFFORT WILL BE REQUIRED. IN THE MEANTIME, EPA IS CONCENTRATING ON ROCK QUARRIES THAT MAY CONTAIN SERPENTINITE (GEOLOGISTS AGREE THAT SERPENTINITE USUALLY CONTAINS AT LEAST SOME ASBESTOS).

LAST WINTER, THE USGS AND BOM PROVIDED EPA WITH MAPS OF SERPENTINITE AND OTHER ULTRAMAFIC ROCK DEPOSITS AND MAPS OF MOST QUARRY LOCATIONS. BY COMPARING THE MAPS AND USING APPROPRIATE MARGINS TO ALLOW FOR THE IMPRECISION OF THE MAPS, EPA WAS ABLE TO PREPARE A LIST OF APPROXIMATELY 300 QUARRIES LOCATED WITHIN OR IN THE VICINITY OF SERPENTINITE BELTS. THE APPROPRIATE STATE GEOLOGISTS WERE THEN ASKED FOR THEIR ASSESSMENTS OF THOSE QUARRIES BY MARCH 1. SEVERAL HAVE STILL NOT RESPONDED. THIS SCREENING PROCEDURE HAS ALLOWED EPA TO CLEAR APPROXIMATELY 100 QUARRIES FROM THE LIST OF 300.

HAVING THUS ASSESSED ALL OF THE UNITED STATES EXCEPT ALASKA, EPA HAD ORIGINALLY PLANNED FOR GEOLOGISTS TO INSPECT EACH OF THE SUSPECT QUARRIES TO DETERMINE IF SERPENTINITE IS PRESENT. IN FACT, EPA AND EPA CONTRACTORS HAD SPENT CONSIDERABLE TIME IN DEVELOPING A STANDARD PROCEDURE. HOWEVER, THE CRUSHED STONE INDUSTRY REFUSED TO COOPERATE IN A PROGRAM TO ESTABLISH THE ACCURACY AND RELIABILITY OF SUCH INSPECTIONS.

CONSEQUENTLY, EPA NOW PLANS TO OBTAIN CRUSHED STONE PRODUCT SAMPLES FROM THOSE QUARRIES FOR WHICH NO FIRM ASSESSMENT HAS BEEN RECEIVED. ADDITIONAL INFORMATION IS NEEDED FOR QUARRIES IN 12 STATES. EPA HAS STARTED ISSUING CONTRACTS FOR PETROGRAPHIC ANALYSES OF THESE SAMPLES. ALSO, CONTRACTS ARE BEING ISSUED FOR ELECTRON MICROSCOPE ANALYSES OF CRUSHED STONE SAMPLES FROM THOSE QUARRIES WHICH ARE KNOWN, OR FOUND, TO CONTAIN SOME SERPENTINITE. BEGINNING NOW AND CONTINUING OVER THE NEXT FOUR TO SIX MONTHS, EPA INTENDS TO HAVE CONTRACTORS EXAMINE CRUSHED STONE

SAMPLES FROM AT LEAST 80 QUARRIES TO DETERMINE WHETHER THEY CONTAIN SOME SERPENTINITE AND TO START ELECTRON MICROSCOPE ANALYSIS PROGRAMS FOR QUARRIES FOUND TO BE MINING ROCK CONTAINING SOME SERPENTINITE.

STANDARDS DEVELOPMENT

ORDERLY PROGRESS TOWARDS DETERMINING WHETHER EPA SHOULD PROPOSE A NATIONAL EMISSION STANDARD IS DEPENDENT NOT ONLY ON DETERMINING WHICH QUARRIES CONTAIN ASBESTOS BUT ALSO ON ASSESSING THE DEGREE TO WHICH THE PUBLIC IS EXPOSED TO UNBOUND USES OF THE CRUSHED STONE. INFORMATION HAS BEEN REQUESTED FROM FEDERAL, STATE, AND LOCAL HIGHWAY DEPARTMENTS; STATE AND LOCAL AIR POLLUTION CONTROL AGENCIES; STATE MINERAL RESOURCES DEPARTMENTS; CRUSHED STONE TRADE ASSOCIATIONS; AND CRUSHED STONE PLANTS. SUCH INFORMATION IS NOT READILY AVAILABLE.

WHILE EPA HAS BEEN GATHERING THE PRINCIPAL INFORMATION ON ASBESTOS OCCURRENCES AND AIRBORNE ASBESTOS CONCENTRATIONS, EPA HAS ALSO BEEN PREPARING SUPPLEMENTARY INFORMATION, SUCH AS COMPUTER MODELLING OF THE DISPERSION OF THE ASBESTOS EMISSION AND THE ECONOMIC IMPACTS OF CONTROL ALTERNATIVES.

THE CURRENT SCHEDULE INCLUDES COMPLETION BY THIS FALL OF THE ALREADY STATED EFFORT TO DETERMINE WHICH QUARRIES CONTAIN ASBESTOS AND COMPLETION OF QUANTIFICATION OF THE ASBESTOS CONTENT BY THE FIRST OF NEXT YEAR. THESE EFFORTS ARE THE PRINCIPAL PACE-SETTING FACTORS FOR THE DEVELOPMENT

OF AN EMISSION STANDARD IF NECESSARY TO SUPPLEMENT STATE REGULATIONS. ONCE THE ANALYSES ARE COMPLETED, A DRAFT STANDARD SUPPORT AND ENVIRONMENTAL IMPACT STATEMENT CAN BE DISTRIBUTED WITHIN A MONTH OR TWO.

REFERENCES

1. JULY 7, 1977, FACT SHEET
2. JUNE 1, 1977, HEALTH ASSESSMENT BY EPA HEALTH EFFECTS RESEARCH
LABORATORY
3. JUNE 6, 1977, RECOMMENDATIONS TO MONTGOMERY COUNTY EXECUTIVE FROM EPA
REGION III
4. NOVEMBER 10, 1977, ADVANCE NOTICE OF PROPOSED RULEMAKING

To utilize and supervise, in accordance with procedures devised with the concurrence of the Army and Navy Munitions Board, the services of the contracting and procurement officers and inspectors of the War and Navy Departments, in connection with priorities and related matters.

To establish preferences with respect to indirect defense material and domestic and foreign material, pursuant to such agreement and cooperation as may be necessary.

Now, THEREFORE, by virtue of the authority vested in the aforesaid Director of Priorities, it is hereby ordered that:

I. VALIDATION AND EXTENSION OF PREVIOUS PRIORITIES ACTIONS AND ORDERS

All preference rating certificates, blanket preference rating orders, and other orders and directions establishing priorities and all other actions with respect to preference ratings and priorities, and with respect to related matters, heretofore issued, signed, ordered, directed or taken by the Priorities Committee of the Army and Navy Munitions Board, by the Army and Navy Munitions Board, by said former Administrator of Priorities and said former Priorities Board, and by said Director of Priorities, and by their authority, are hereby validated and continue valid in effect until termination or expiration by the terms thereof or by circumstances or conditions of their application, or until heretofore rescinded, cancelled, modified, changed or amended by action by the said Director of Priorities.

II. DUTIES AND FUNCTIONS OF THE PRIORITIES COMMITTEE OF THE ARMY AND NAVY MUNITIONS BOARD

1. Establishment of Schedules of Preference Ratings

(a) *For Army and Navy orders.*—The Priorities Committee of the Army and Navy Munitions Board shall, with the concurrence of the Director of Priorities, by Priorities Directives, establish schedules of preference ratings to be assigned to categories of contracts and orders of the Army and Navy and extensions to subcontracts and suborders thereunder, according to the relative importance of the various Procurement projects of the Army and Navy in the Defense program.

(b) *For other United States Government agency orders.*—The Priorities Committee of the Army and Navy Munitions Board shall establish, subject to the approval of the Director of Priorities, schedules of preference ratings to be assigned to categories of contracts and orders of the other agencies of the United States Government, which shall include, until further order, the Coast Guard, Maritime Commission,

...to indirect defense material, and de-
pendent to such agreement and cooperation as

Section of Previous Proceedings

... establishing priorities and all other
... ratings and priorities, and with
... before issued, signed, ordered, directed
... of the Army and Navy Munitions
... Planning Board, by said former
... Planning Board, and by
... their authority, are hereby validated
... termination or expiration by the terms
... conditions of their application, or until
... modified, changed or annulled by action

Schedule of Preference Ratings

er.—The Priorities Committee of the
and shall, with the concurrence of the
the Director, establish schedules of
to materials or contracts and orders
under or subcontracts and suborders
of importance of the various Pro-
and Navy in the Defense program.
Government agency orders.—The Pri-
ority Management Board shall estab-
lish a schedule of priorities, schedules of
to materials or contracts and orders
under or subcontracts and suborders
of importance of the various Pro-
and Navy in the Defense program.

(c) *For foreign government orders.*—The Priorities Committee of the Army and Navy Munitions Board shall, subject to the approval of the Director of Priorities, establish schedules of preference ratings to be assigned to categories of contracts and orders of certain foreign governments including, until further order, Great Britain and Canada.

The assignment of all such preference ratings to deliveries of material under all contracts and orders hereinbefore specified in paragraph 1, and the extension of such preference ratings to deliveries of material which enter directly or indirectly into the manufacture of any material for delivery under such preference ratings to deliveries of material Priorities Committee of the Army and Navy Munitions Board and the contract and procurement officers and inspectors of the Army and Navy, in accordance with the Army and Navy Priorities Instructions (copy of which is hereto attached); Provided,

(s) Such preference ratings shall apply only to items which appear upon the Priorities Critical List as revised to March 15, 1941, of the Priorities Committee of the Army and Navy Munitions Board (copy of which is attached hereto), as the same may be supplemented, modified or changed from time to time by said committee with the approval of the Director of Priorities.

(b) That ratings higher than those authorized by the then current Priorities Directives referred to in paragraph 1 above may be assigned by the Priorities Committee of the Army and Navy Munitions Board with the concurrence of the Director of Priorities.

(Signed) **E. R. SHERIDAN, Jr.,**
Director of Priorities

March 17, 1941

One room with two chairs is designated for the treatment of injuries of the lower extremities.

c. One room with 4 tables is provided for treatment of eye conditions. Infra-red has been used in the treatment of some eye flashes, with some benefits ascribed.

d. One minor surgery is located conveniently to X-ray room and ambulance entrance. Two tables are provided along with necessary anesthetic facilities and other equipment.

e. A two bed ward for women and a four bed ward for men are provided, without segregation for races.

f. A doctor's office and examination room are present.

g. Nurses' dressing room is provided.

h. A 15 milliampere X-ray is available. Anything requiring a more powerful unit is referred to the local hospital.

i. A physiotherapy room with 6 - 7 infra-red lamps and 5 work tables are provided. All diathermy is referred to the hospital. No costs of the referral was obtained but in all other yards it has been found more economical of government funds and worker's time to provide one or more machines of this type. It is recommended that this be done here also.

j. Toilet facilities are adequate.

k. Storeroom is sufficient.

l. Necessary dark room and viewing apparatus is available.

No information of medical costs were available.

H-4 Equipment:

- a. One ambulance is now provided. It is a converted station wagon which is about worn out. I was informed that request for replacement has been made. This should be granted as soon as possible to assure that adequate transportation is available.
- b. No auxiliary transportation is provided although a private ambulance may be obtained if needed.
- c. X-ray equipment is adequate.
- d. Necessary dispensary stores are provided.

H-5 Records and Forms:

5.1 Summary of Records and Forms

- a. A foreman's pass is required for each visit, which shows time the pass is issued. The time patient leaves the dispensary is also marked. The patient does not check into the dispensary but proceeds directly for treatment. The nurse or doctor makes the necessary notes, including diagnosis and treatment and disposition of the case on the foreman's pass, after which the patient then goes to the clerk where a record card is made out. This does not provide opportunities for checking the patient into the dispensary. There is thus no opportunity of determining the time taken by the patient in arriving at the dispensary or time spent in receiving treatment. Compliance with "Minimum Requirements..." paragraph 5.1-a in this regard is recommended. This could be easily done by placing a time marking device at the entrance for men or a clerk to use in stamping the first-aid pass.
- b. Subsequent revisits are recorded and noted on the foreman's pass which are supposed to be transcribed to the original record card.

C O P Y

October 9, 1974

Mr. H. B. Vanderbilt
President
Chief Executive Officer
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 08855

Dear Mr. Vanderbilt:

This is in reply to your letter of September 26, concerning your request for relief from the asbestos standard for your talcs containing non-fibrous tremolite, actinolite, and anthophyllite.

My letter of August 6 stated that non-fibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the asbestos standard and, therefore, the provisions of that standard do not apply to talc containing non-asbestiform minerals.

NIOSH is currently conducting a thorough investigation into the exact minerals to which talc workers were exposed in those studies where asbestosis or other adverse medical effects were found.

Pending the receipt and evaluation by OSHA of the report by NIOSH on this investigation, if you have scientific evidence that the naturally occurring talcs, prior to processing by milling or crushing, do not contain fibrous or asbestiform tremolite, anthophyllite, actinolite or other asbestiform minerals, you may certify to your customers that the talc does not contain asbestos.

Fibrous, asbestiform minerals such as fibrous tremolite means naturally occurring asbestiform minerals which prior to or after crushing and processing, contain fibers made up of fibrils.

Sincerely,

/s/ John H. Stender

John H. Stender
Assistant Secretary of Labor

CRMC-MAD-000491

C014583

what is asbestos?

by James W. Edman

A recent workshop on asbestos attracted experts from many disciplines and several nations. Information on current methods and experiments involving asbestos was presented, and many fundamental questions were raised. One basic disagreement centered around a definition of the term "asbestos."

While millions of Americans flocked to beaches and lemonade stands for relief from the mid-July heat wave, distinguished scientists from the U.S. and abroad braved the sweltering conditions to gather at the 5-acre complex of the National Bureau of Standards (NBS) in Gaithersburg, Maryland. In essence, the torrid weather was an incongruous background for the July 18-20 meeting. The scientists were discussing a heat-resistant material—yes—but not how it might be applied to reduce the threat of heat prostration. Eminent toxicologists, mineralogists, biologists, industrial hygienists, and physicians had congregated at the OSHA-sponsored "Workshop on Asbestos" to discuss what factors must be considered by researchers and governmental regulatory agencies when addressing health problems (lung cancer, pleural and peritoneal mesothelioma, asbestosis) associated with asbestos expo-

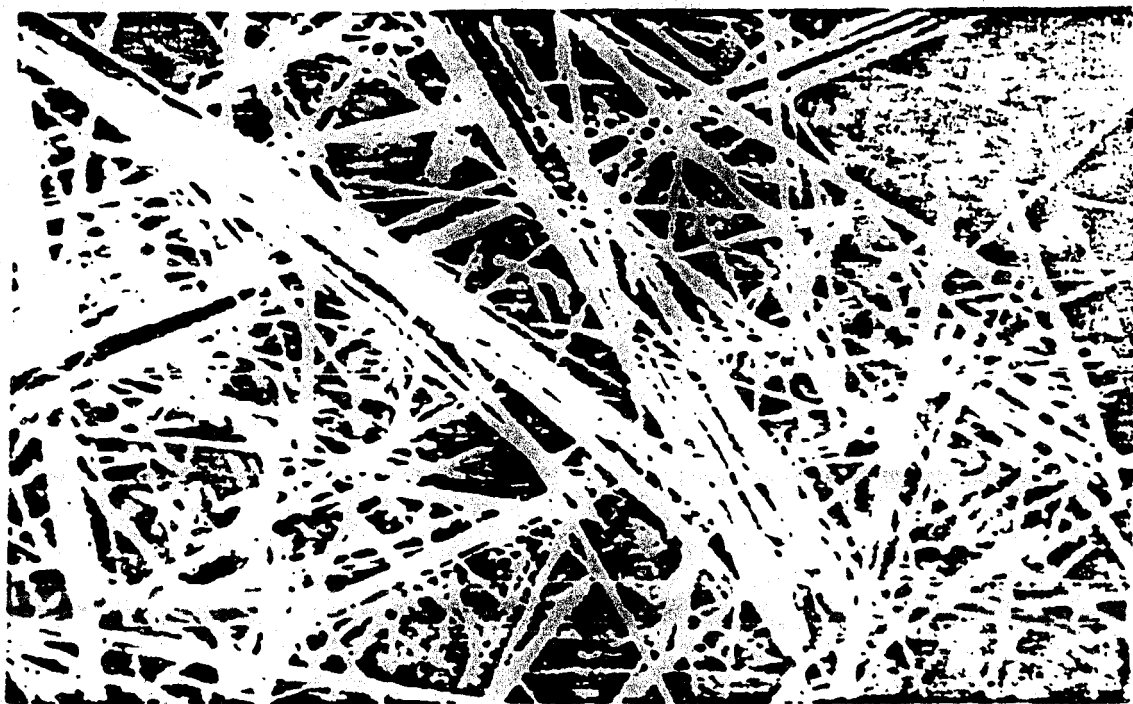
asbestos a standardized procedure likely to be universally acceptable to the scientific and industrial communities.

The standard procedure also would have to be acceptable to the many government agencies involved in regulating asbestos exposure. In addition to OSHA, the Environmental Protection Agency (EPA), the Food and Drug Administration, the Consumer Product Safety Commission, and the Mining Enforcement and Safety Administration are looking at the problem posed by asbestos exposure as it occurs in their respective regulatory spheres. Nonregulatory agencies such as NIOSH, the National Institute of Environmental Health Sciences, and the National Cancer Institute are also researching the health effects of asbestos exposure. Currently, only EPA has a firmly established procedure for analyzing fibers suspected to be asbestiform. In conducting analyses, OSHA uses a very elaborate series of tests which were recommended by NIOSH. Martonik explains, "Our San Jose City laboratory must devote so much of its time to analysis work that there is precious little left in which to develop formal procedures."

Obtaining what OSHA hoped to gain in holding the conference, John Martonik, an industrial hygienist in OSHA's Directorate of Research and Support and chairperson for the workshop-closing session, said, "We wanted to obtain a variety of opinions concerning the definition of asbestos and the latest methodology for identifying asbestiform fibers." After reviewing all comments and questions broached in the conference, OSHA will develop research projects to be conducted by NBS. Martonik hopes that, when completed, the NBS will have established for the analysis of

While Martonik believes that OSHA can define a project for NBS to pursue in light of information presented at the workshop, any participant who hoped that the conference would settle some of the controversy surrounding asbestos health problems would have left the workshop disappointed. OSHA wanted to bring a variety of opinions, and that is what it got. Many problems and questions concerning

Amosite asbestos fibers as photographed under the scanning electron microscope.



tos were raised by workshop participants; few, if any, were resolved. Indeed, there was a wide difference of opinion as to which of the many questions about asbestos were most important.

One point of agreement

There was, however, one point upon which seemingly all workshop participants agreed—the need for a precise determination of which minerals are, in fact, asbestos or asbestiform. In the conference's opening presentation, University of Minnesota geologist Dr. Tibor Zoltai noted that, until about five years ago, there had never been a problem with terminology. Before that time, interest in fibrous silicates was pretty much the exclusive domain of geologists, who always understood what their colleagues meant by terms such as "asbestos," "asbestiform," "fiber," and "fibrous." With the growth of interest in the health problems related to asbestos and the subsequent discussions and research by scientists from other disciplines such as biology, medicine, and chemistry, the fine distinctions inherent in the terms as used by geologists became blurred, Zoltai said. The now-fuzzy terminology, he said, has led to false or at least sloppy characterization of many minerals as "asbestos" or "asbesti-

form" which were never previously considered as such by mineralogists.

Part of the reason for the present confusion in terminology is the fact that asbestos is not a specific mineral; it is a generic name for hydrated mineral silicates. In addition to the six asbestos minerals named in the OSHA standard, there are several other varieties of asbestiform minerals—fibrous silicates which have chemical and physical characteristics similar to those of commercial asbestos.

Zoltai called for creation of an "international language" acceptable to researchers in all the scientific spheres now investigating asbestos characteristics and effects. The necessity of having a universal, precise terminology was stressed time and again during the workshop.

In his closing remarks, Dr. C. S. (Slim) Thompson, a mineralogist for the Vanderbilt Company and representative of the American Mining Conference, restated the problem caused by loose terminology. "Even better, we know what asbestos is," he said, "but they don't know what it isn't. . . . Let's cut through what they are not what they are not. There must be a standard. Minerals must be thoroughly characterized before medical research which is being done can be

done." Otherwise, he said, the researchers don't know what they are testing, and the government agencies that use the results of these studies as the bases for their standards don't know what they are regulating.

Several possible definitions of asbestos were offered at the workshop. Robert Fisher of U.S. Steel proposed that all silicates which separate into fibers after light grinding be classified as asbestiform if the fibers meet three criteria: They have a length-to-width ratio greater than 10:1; they have parallel sides; and they are more than two microns in length. Fisher added the caution that mineral fragments are not the same as mineral fibers and that this distinction must be recognized in any regulation.

Dr. Malcolm Ross of the U.S. Geological Survey said there were three possible definitions of asbestos: 1) all silicates with a 3-1 length-to-width ratio; 2) all silicates with a 3-1 length-to-width ratio that are either amphibole or serpentine; and 3) only those silicates known to have commercial value as asbestos. Ross advised regulatory agencies to consider carefully the economic impact of any new regulations. A broadly inclusive definition of asbestos could result in shutting down many hard rock quarrying operations, and "the small mining industries will be wiped out," he claimed.

Confessing to "despair" over the evident confusion in terminology, Dr. Jack Zussman, a mineralogist from the University of Manchester, pointed out one bad effect: that the lack of a precise definition of asbestos has on the public. "The loose labeling of materials as 'asbestos' generates alarm. When we find later that these minerals aren't asbestos, it's too late to undo the anger and worry caused by the original misidentification." Summing up the current state of technical knowledge about asbestiform minerals, Zussman said, "We pretty well know the effects of commercial asbestos—though they may need to be quantified a bit more. What we don't know, and what we need to proceed with caution on, are the effects, if any, of noncommercial mineral fibers."

A great unknown

One of the biggest questions about asbestos is: Exactly what is it about asbestos fibers that causes adverse health effects? The importance of the precise chemical composition of a fiber-forming mineral is largely unknown. Also, though some researchers believe that any fibrous silicate can

OSHA's Asbestos Standard— A Status Report

OSHA's current standard on asbestos was promulgated on June 7, 1972. It defined "asbestos" as chrysotile, tremolite, crocidolite, actinolite, anthophyllite, and actinolite and included every product containing any of these minerals. For regulatory purposes, an asbestos fiber was defined as a particulate form of asbestos, longer than 5 microns, with a length-to-diameter ratio of at least 3-to-1 and a maximum diameter of 5 microns.

The 1972 standard originally established a maximum 8-hour time-weighted-average (TWA) concentration of 5 asbestos fibers per cubic centimeter of air, and a ceiling exposure limit of 10 fibers per cubic centimeter. On July 1, 1976, a further provision of the standard took effect, lowering the permissible 8-hour TWA to two fibers per cubic centimeter of air. The two-fiber limit remains in effect today.

On October 9, 1975, OSHA proposed a new regulation for asbestos. Among other things, the proposal would lower the permissible 8-hour TWA exposure level to 0.5 fibers per cubic centimeter and would reduce the permissible ceiling exposure level to 5 fibers per cubic centimeter for any 15-minute period. This proposal would not apply to the construction industry, which would be required to follow a different standard to be proposed later.

A separate asbestos standard for the construction industry has not yet been proposed, nor have hearings on the 1975 proposal been scheduled. An economic impact statement concerning the proposed revision is nearing completion.

Meanwhile, on December 2, 1975, OSHA asked NIOSH to reevaluate available information on the health effects of occupational exposure to asbestos. Completed in December of 1976, the NIOSH reexamination was forwarded to OSHA in May. Finding no evidence of a "safe" level of asbestos exposure, NIOSH recommended treating asbestos like other carcinogens by allowing only the lowest exposure level detectable by available analytical techniques. NIOSH recommended a 0.1 fiber TWA and a 0.5 fiber ceiling limit for occupational exposures to asbestos.

cause cancer, others believe that virtually any substance, such as fiberglass, can induce the same health problems if its fibers are of the same size and long, thin shape as asbestos fibers.

Another crucial issue that must be resolved is the importance of fiber size in causing disease. Mt. Sinai Hospital's Dr. Arthur Langer noted that, although some studies have produced different results, there is evidence that small fibers (less than five micrometers in length) are biologically active. Taking the opposite position, Dr. Clark Cooper of Equitable Environmental Health, Inc. stated, "We have no acceptable evidence on the pathogenicity of fibers less than five micrometers in length. . . . The evidence of most animal tests is overwhelming that short fibers do not cause fibrosis or malignancy."

The importance of fiber size must be taken into account when anticipating any new asbestos regulation. OSHA's current standard, which stipulates that only fibers at least five micrometers long be counted when determining exposure levels (see box), was characterized by Cooper as "arbitrary based on little more than the fact that fibers of this size are visible under the light microscope." However, he pointed out, "For every fiber you can see in the light microscope, there are ten you can see in the electron microscope. No one will be satisfied with an analytical method based on light microscopy alone," he concluded.

But, while Cooper had some reservations about a standard centering on fibers at least five microns long, Johns-Manville's Dr. Paul Kotin testified that most fibers making their way into the human body and lodging there are less than 3.5 microns wide and 200 microns long, and greater than 5 microns in length.

Kotin also stated his belief that, though no safe level of asbestos exposure has yet been determined, medical research eventually will determine a "no effect" dose level for asbestos as it has for other toxins. In asserting that a tolerance threshold will be found, Kotin noted that no epidemiological study has been able to determine the dose amounts suffered during human exposure.

Acceptable risk

While the existence of a tolerance threshold remains a question, regulatory agencies are confronted with a hard decision: how to arrive at establishing a permissible exposure level, in a manner as feasible to attain and at the same

time reduces the risk of disease to a level "acceptable" to those people they are responsible for protecting. Expressing "sympathy" for regulators faced with making this determination for asbestos exposure, Cooper observed, "We know the fibers cause health effects, but we don't have reliable biological data on which to base regulation."

Citing the need for determining what is an acceptable asbestos risk, Cooper continued, "Regardless of whether there is a threshold or not, the odds—not absolutes—are what is important in life. We live in a world of consideration, probability, and acceptable risk. The situation with asbestos is not analogous to that with vinyl chloride; we are not dealing with a synthetic molecule, but with a physical agent that occurs in nature with a lot of variables." Malcolm Ross reiterated this thought. Noting the pervasiveness of fibrous silicates in American rock formations, Ross warned, "We will have to find an acceptable health risk, or else we will have to shut down the surface of the earth."

A look ahead

At the end of the conference, a comment made from the floor seemed to meet with widespread approval. A workshop participant suggested establishing an interagency taskforce that would periodically review ongoing research projects dealing with asbestos. The taskforce could offer researchers guidance and direction to assure that they were considering all pertinent variables in their analyses. The taskforce also could serve to avoid overduplication of research by keeping abreast of the multitude of projects being conducted independently by universities, industry, and government. This suggestion was perhaps the one new idea to come out of the three-day conference.

Summing up his impressions of the workshop, Mt. Sinai's Langer said, "We've really learned nothing new. We know we need a lot of research to determine the biological activity of rock-forming silicates, and we know that the whole problem has been muddled by the misuse of terms." Refusing to be overwhelmed by the mass of unanswered questions still surrounding asbestos research, Langer advised, "Remember, this is a very new subject. It's a hell of a big problem, and there's a lot of work to do. This [conference] is just the first round."

James H. Smith is a member of the Board of Job Safety and Health.

CRMC-MAD-000495

C O P Y

October 9, 1974

Mr. H. B. Vanderbilt
President
Chief Executive Officer
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 08855

Dear Mr. Vanderbilt:

This is in reply to your letter of September 26, concerning your request for relief from the asbestos standard for your talcs containing non-fibrous tremolite, actinolite, and anthophyllite.

~~My letter of August 1, 1974, stated that non-fibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the asbestos standard and, therefore, the provisions of that standard do not apply to talc containing non-asbestiform minerals.~~

NIOSH is currently conducting a thorough investigation into the exact minerals to which talc workers were exposed in those studies where asbestosis or other adverse medical effects were found.

Pending the receipt and evaluation by OSHA of the report by NIOSH on this investigation, if you have scientific evidence that the naturally occurring talcs, prior to processing by milling or crushing, do not contain fibrous or asbestiform tremolite, antophyllite, actinolite or other asbestiform minerals, you may ~~certify to your customers that the talc does not contain asbestos.~~

~~Fibrous, asbestiform minerals such as fibrous tremolite means naturally occurring asbestiform minerals which prior to or after crushing and processing, contain fibers made up of fibrils.~~

Sincerely,

/s/ John H. Stender

John H. Stender
Assistant Secretary of Labor

CRMC-MAD-000496

October 9, 1974

Mr. P. T. Vanderbilt
President
Chief Executive Officer
R. T. Vanderbilt Company, Inc.
39 Winfield Street
Norwalk, Connecticut 06855

Dear Mr. Vanderbilt:

of 1

This is in reply to your letter of September 26, concerning your request for relief from the asbestos standard for your talcs containing non-fibrous tremolite, actinolite, and anthophyllite.

My letter of August 6 stated that non-fibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the asbestos standard and, therefore, the provisions of that standard do not apply to talc containing non-asbestiform minerals.

NIOSH is currently conducting a thorough investigation into the exact minerals to which talc workers were exposed in those studies where asbestosis or other adverse medical effects were found.

Pending the receipt and evaluation by OSHA of the report by NIOSH of this investigation, if you have scientific evidence that the naturally occurring talc, prior to, or after processing by milling or crushing, do not contain fibrous or asbestiform tremolite, actinolite, anthophyllite or other asbestiform minerals, you may certify to your customers that the talc does not contain asbestos.

Fibrous, asbestiform minerals such as fibrous tremolite means naturally occurring asbestiform minerals which prior to or after crushing and processing, contain fibers made up of fibrils.

Sincerely,

/s/ John E. Stender

CRMC-MAD-000497

October 9, 1974

Mr. R. T. Vanderbilt
President
Chief Executive Officer
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 06855

Dear Mr. Vanderbilt:

This is in reply to your letter of September 26, concerning your request for relief from the asbestos standard for your talcs containing non-fibrous tremolite, actinolite, and anthophyllite.

My letter of August 6 stated that non-fibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the asbestos standard and, therefore, the provisions of that standard do not apply to talc containing non-asbestiform minerals.

NIOSH is currently conducting a thorough investigation into the exact minerals to which talc workers were exposed in those studies where asbestosis or other adverse medical effects were found.

Pending the receipt and evaluation by OSHA of the report by NIOSH of this investigation, if you have scientific evidence that the naturally occurring talc, prior to, or after, processing by milling or crushing, do not contain fibrous or asbestiform tremolite, actinolite, or other asbestiform minerals, you may certify to your customers that the talc does not contain asbestos.

Fibrous, asbestiform minerals such as fibrous tremolite means naturally occurring asbestiform minerals which prior to or after crushing and processing, contain fibers made up of fibrils.

Sincerely,

/s/ John H. Stender

John H. Stender
Assistant Secretary of Labor

CRMC-MAD-000498

October 9, 1974

Mr. H. B. Vanderbilt
President
Chief Executive Officer
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 08855

Dear Mr. Vanderbilt:

This is in reply to your letter of September 26, concerning your request for relief from the asbestos standard for your talcs containing non-fibrous tremolite, actinolite, and anthophyllite.

My letter of August 6 stated that non-fibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the asbestos standard and, therefore, the provisions of that standard do not apply to talc containing non-asbestiform minerals.

NIOSH is currently conducting a thorough investigation into the exact minerals to which talc workers were exposed in those studies where asbestosis or other adverse medical effects were found.

Pending the receipt and evaluation by OSHA of the report by NIOSH on this investigation, if you have scientific evidence that the naturally occurring talcs, prior to processing by milling or crushing, do not contain fibrous or asbestiform tremolite, anthophyllite, actinolite or other asbestiform minerals, you may certify to your customers that the talc does not contain asbestos.

Fibrous, asbestiform minerals such as fibrous tremolite means naturally occurring asbestiform minerals which prior to or after crushing and processing, contain fibers made up of fibrils.

Sincerely,

/s/ John H. Stender

John H. Stender
Assistant Secretary of Labor

CRMC-MAD-000499

October 9, 1974

Mr. H. B. Vanderbilt
President
Chief Executive Officer
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 08855

Dear Mr. Vanderbilt:

This is in reply to your letter of September 26, concerning your request for relief from the asbestos standard for your talcs containing non-fibrous tremolite, actinolite, and anthophyllite.

My letter of August 6 stated that non-fibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the asbestos standard and, therefore, the provisions of that standard do not apply to talc containing non-asbestiform minerals.

NIOSH is currently conducting a thorough investigation into the exact minerals to which talc workers were exposed in those studies where asbestosis or other adverse medical effects were found.

Pending the receipt and evaluation by OSHA of the report by NIOSH on this investigation, if you have scientific evidence that the naturally occurring talcs, prior to processing by milling or crushing, do not contain fibrous or asbestiform tremolite, antophyllite, actinolite or other asbestiform minerals, you may certify to your customers that the talc does not contain asbestos.

Fibrous, asbestiform minerals such as fibrous tremolite means naturally occurring asbestiform minerals which prior to or after crushing and processing, contain fibers made up of fibrils.

Sincerely,

/s/ John H. Stender

John H. Stender
Assistant Secretary of Labor

CQ14906

CRMC-MAD-000500

[Title]

Log Sheet Number 1261

Docket Name ASBESTOS
 Docket Number 1972

Federal Register Cite:
 Date:

Deadline:
 Extd:

No.	Name and Address (Corp)	Date Submitted	Submission	Appl. of Writer	Attachments (if any)	No. Pgs.	HSPD Coding
					Petition and request for consideration from the Chamber of Commerce	7	318
					Petitions for Review of the	11	319
				VACANT	United Paperworkers Int'l		320
					R.T. Vanderbilt	166	321
					Petition from the AFL-CIO	24	322
					Status of petitions	8	323
					Petitions from OCAW	8	324
					Petition from Chamber of Commerce of the United States.	83	325

CRM-C-MAD-000501

AL102

Docket Name ASBESTOS/1975
Docket Number H-033

Federal Register Cite:
Date:

Deadline:
Extd:

HSPD

Name and Address (Corp)	Date Submitted	Submission	Affl. of Writer	Attachments (if any)	No. Pgs.	
				Federal Register Notice announcement of Advisory Committee on Construction Safety and Health meeting		326
				Notice of January 21, 1976 meeting		327
				Instructions to the Committee		328
				June 2 and 3 meeting		329
				Presentation to the Committee from OSHA		330
				August 13 and 14, 1975 Advisory Committee meeting		331
				Federal Register Granting on Extension of time to file comments		332

AL102

CRM-MAD-000502

CUMMERIS

Docket Name

ASB&STOS;1975

Docket Number

H-033

	Name and Address (Corp)	Date Submitted	Submission

CRM-C-MAD-000503

Federal Register Cite:
Date:

411

Deadline:
Ext'd:

HSPD

Affl. of Writer	Attachments (if any)	No. Pos.	Citation
	Comments on the reviewed Asbestos proposal		333
	Johns-Manville Corporation comments		334
	Comments on the Hune 2 and 3, 1976 Asbestos subgroup	3	335

AL102

STUDIES/REPORTS

Docket Name

ASBESTOS/1975

Docket Number

H-033

Name and Address (Corp)	Date Submitted	Submission

CRM-C-MAD-000504

U
Federal Register Cite:
Date:

Deadline:
Extc:

14580

Affl. of Writer	Attachments (if any)	No. Pgs.	Code
	Committee Recommendations for the 1976 period		336
	Minutes of meeting of January 7-10	17	337
	Comments by the Union Carbide Corporation on the January 21 and 22, 1976 Construction Advisory Committee meeting	8	338
	Instructions to Committee Drafting 1976 Asbestos Recommendations	5	339

AL102

Docket Name

ASBESTOS/1975

Docket Number

H-033

Name and Address (Corp)	Date Submitted	Submission

CRM-C-MAD-000505

Federal Register Cite:

Date:

(41)

Deadline:

Extd:

HSPD

Affl. of Writer	Attachments (if any)	No. Pgs.	Page
	August 13, 1975 meeting		3-10
	August 14, 1975 meeting		3-11
	January 21, 1976 meeting		3-12
	June 2, 1976 meeting		3-13
	June 3, 1976 meeting		3-14
	June 29, 1976 meeting	313	3-15
	June 30, 1976 meeting	316	3-16

AL102

Docket Name ASBESTOS/1975

Docket Number H-033

Name and Address (Corp)	Date Submitted	Submission

CRM-C-MAD-000506

Federal Register Cite:
Date:

Deadline:
Extd:

(15)

11/5/77

Affl. of Writer	Attachments (if any)	No. Pgs.	Section
	Occupational Exposure to Asbestos Notice of Proposed Rulemaking		347

AL102

Docket Name

ASBESTOS/1975

Docket Number

II-033

Name and Address (Corp)	Date Submitted	Submission
Asbestos Information Association 1660 L Street, N.W. Washington, D.C. 20036		
IIT Research Institute 10 West 35th Street Chicago, Illinois 60616		
1. Royal Industries Brake Products Stewarts Lane Danville, Kentucky 40422		
2. The Hahnemann Medical College & Hospital of Philadelphia Two-Thirty North Broad Street 917 Schaff Bldg. Philadelphia, Pa. 18102		
3. Johns-Manville Corp Greenwood Plaza Denver, Colorado 80217		
4. R.T. Vandervilt Company, Inc. 10 Winfield Street Norwalk, Conn. 06852		
5. Friction Mat'ls Standards Institute, Inc. Bergen Mall Office Center E. 210 Route 4 Paramus, N.J. 07652		

CRMC-MAD-000507

Federal Register Cite:
Date:

Deadline:
Extd:

115FD

Affl. of Writer	Attachments (if any)	No. Pgs.	Endino
			348
			349
			350
			351
			352
			353
			354

AL102

Docket Name ASBESTOS/1975
Docket Number H-033

8.	Name and Address (Corp)	Date Submitted	Submission
8.	Carlisle Corp. P.O. Box P, Gillis Avenue Ridgway, Pa. 15853		
9.	Geoffrey Nicholson 822 Oak Ridge Road Winchester, Va. 22601		
10.	SAV Associates-Microanalysis Lab 15025 Shady Grove Road Rockville, Maryland 20850		
11.	H.K. Porter Company, Inc. Porter Building Pittsburgh, Pa.		
12.	Nicolet, Inc. Executive Offices Wissahickon Avenue Ambler, Pa. 19002		
13.	Western Electric 222 Broadway New York, N.Y. 10038		
14.	Abex Corp. P.O. Box 607 Winchester, Va. 22601		

CRMC-MAD-000508

U

Federal Register Cite:

Date:

(57)

Deadline:

Extd:

HSPD

Affl. of Writer	Attachments (if any)	No. Pgs.	Coding
			355
			356
			357
			358
			359
			360
			361

AL102

Bucket Name ASBESTOS/1975
Docket Number II-033

Federal Register Cite:
Date:

Deadline:
Extd:

No. and Address (Corp)		Date Submitted	Submission	Affl. of Writer	Attachments (if any)	No. Pgs	Index
15.	Rubber Manufacturers Assoc. 1901 Penn Avenue, N.W. Washington, D.C. 20006						362
16.	American Iron & Steel Institute 1000 16th Street, N.W. Washington, D.C. 20036						363
17.	Armstrong Cork Company Lancaster, Pa. 17604						364
18.	Union Carbide Corp. 270 Park Avenue, N. New York, N.Y. 10017						365
19.	Kansas City Power & Light Company 1330 Baltimore Avenue Kansas City, Missouri 64141						366
20.	Paint Engineering 333 Kearny Street Room 403 San Francisco, CA 94108						367
21.	Call-Block 15930 S. Figueroa St. Gardena, CA 90248						368

HPD

AL102

CRMC-MAD-000509

Docket Name ASBESTOS/1975
Docket Number H-033

Federal Register Cite:
Date:

Deadline:
Ext'd:

No.	Name and Address (Corp)	Date Submitted	Submission	Affl. of Writer	Attachments (if any)	No. Pgs.	Coding
22.	United States Steel Corp 600 Grant Street Pittsburgh, Pa. 15230						369
23.	W.R. Grace & Co. Industrial Chemicals Group 62 Whittemore Avenue Cambridge, Mass. 02140						370
24.	Brake and Clutch Service Co. 3404 Elm Street Dallas, Texas 75226						371
25.	Industrial Safety Equipment Assoc., Inc. 1901 N Moore Street Arlington, Va. 22209						372
26.	Industrial Safety Equipment Assoc., Inc. 1901 N Moore Street Arlington, Va. 22209						AL102
27.	Mobil Oil Corp. 150 e 42nd Street New York, N.Y. 10017						
28.	International Paper Co. 220 East 42nd Street New York, N.Y. 10017						375

CRMC-MAD-000510

Docket Name

ASBESTOS/1975

Docket Number

II-033

No.	Name and Address (Corp)	Date Submitted	Submission
29.	Nu-Process Brake Engineers, Inc. 2807 Olive Street St. Louis, MO 63103		
30.	Harcourt Corp. 700 West Caroline St. Paulding, Ohio 45879		
31.	Southern Asbestos Co. P.O. Box 10516 Charlotte, N.C. 28237		
32.	ASARCO Inc. Legal Department 120 Broadway New York, N.Y. 10005		
33.	Zidell Explorations, Inc. 3141 S.W. Moody Avenue Portland, Oregon 97201		
34.	Phillips Petroleum Co. Hartlesville, Oklahoma		
35.	Oil, chemical and Atomic Workers International Union 1126 16th Street, N.W. Washington, D.C. 20036		

0

Federal Register Cite:

Date:

(7)

Deadline:

Extd:

11500

Affl. of Writer	Attachments (if any)	No. Pgs.	Ending
			376
			377
			378
			379
			3
			3
			382

AL102

CRMC-MAD-000511

Docket Name ASBESTOS/1975
Docket Number H-033

Federal Register Cite:
Date:

Deadline:
Extd:

No.	Name and Address (Corp)	Date Submitted	Submission	Affl. of Writer	Attachments (if any)	No. Pgs.	Ending
16.	Standard Oil Company 206 East Randolph Drive P.O. Box 5910-A Chicago, Ill. 60680						383
17.	American Trucking Associations, Inc. 1616 P Street, N.W. Washington, D.C. 20036						384
18.	Phillips Petroleum Company Bartlesville, Oklahoma						385
19.	Gulf States Asphalt Co., Inc. P.O. Box 508 South Houston, Texas 77587						386
20.	Berg-Warner Corp. 290 South Michigan Avenue Chicago, Ill. 60604						387
21.	Consumers Powers Co. 212 West Michigan Avenue Jackson, Michigan 49201						388
22.	St. Joe Minerals Corp. Monaca, Pa. 15061						389

AL102

CRMC-MAD-000512

Docket Name

ASBESTOS/1975

Docket Number

II-033

	Name and Address (Corp)	Date Submitted	Submission
43.	Rockwell International 630 Grant Street Pittsburgh, Pa. 15219		
44.	Pacific Maritime Association 835 Sacramento Street San Francisco, Calif. 94120		
45.	The Markham Co., Inc. 1184 Alden Road Orlando, Florida 32803		
46.	Stanford Research Institute Menlo Park, Ca. 94025		
47.	National Friction Products Corp. 1441 Holland Street P.O. Box 327 Ogansport, Inidiana 46947		
48.	National Maritime Transit Assoc. 2900 Two Girard Plaza Philadelphia, Pa. 19102		
49.	American Public Transit Assoc. 1100 17th Street, N.W. Washington, D.C. 20210		

Federal Register Cite:
Date:

Deadline:
Extd:

(57)

H500

Affl. of Writer	Attachments (if any)	No. Pgs.	Indexing
			370
			371
			372
			373
			374
			AL102
			376

CRMC-MAD-000513

Docket Name ASBESTOS/1975
Docket Number II-033

Federal Register Cite:
Date:

Deadline:
Extd:

No.		Name and Address (Corp)	Date Submitted	Submission	Affl. of Writer	Attachments (if any)	No. Pgs.	Index
50.		Zidell Explorations, Inc. 3121 S.W. Moody Avenue Portland, OR 97201						397
51.		Asbestos Specialties Co. 992 W. 7 Mile Road Detroit, MI 48203						398
52.		Wagner Electric Corp. 6400 Plymouth Avenue St. Louis, MO 63133						399
53.		Shenango Inc. Neville Island Pittsburgh, Pa. 15225						400
54.		Haveg Industries, Inc. 900 Greenbank Road Wilmington, Delaware 19808						401
55.		Organization Resources counselors, Inc. 1460 L Street, N.W. Washington, D.C. 20006						402
56.		Thiokol Corp. Newtown, Pa. 18940						403

CRMCMAD-000514

Docket Name ASBESTOS/1975
Docket Number II-033

Federal Register Cite:
Date: *(11)*

Deadline:
Extd:

No.	Name and Address (Corp)	Date Submitted	Submission	Affil. of Writer	Attachments (if any)	No. Pgs.	Code
57.	Holcomb Safety-Garment Co. 128 North Jefferson Street Chicago, Ill 60606						404
58.	W. Clark Cooper, M.D. 2180 Milvia Street Berkeley, Ca. 94704						405
59.	State of California - Occupational Safety and Health Administration 1006 Fourth Street Sacramento, Ca. 95814						406
60.	3M Company 3M Center St. Paul, Minn. 55101						407
61.	Air Transport Association of America 1709 New York Avenue, N.W. Washington, D.C. 20006						AL102
62.	Pacific Maritime Association 635 Sacramento Street San Francisco, Ca. 94120						
63.	Congress of the United States House of Representatives Washington, D.C. 20515						

CRMCMAD-000515

Docket Name ASBESTOS/1975

Docket Number II-033

No.	Name and Address (Corp)	Date Submitted	Submission
64.	Congress of the United States United States Senate Washington, D.C. 20510		
65.	American Retail Federation 1616 H Street, N.W. Washington, D.C. 20006		
66.	Congress of the United States House of Representatives Washington, D.C. 20515		
67.	National Resources Defense Council, Inc. 15 West 44th Street New York, N.Y. 10036		
68.	Congress of the United States United States Senate Washington, D.C. 20510		
69.	Edison Electric Institute 90 Park Avenue New York, N.Y. 10016		
70.	American Petroleum Institute 2101 I Street, N.W. Washington, D.C. 20037		

Federal Register Cite:
Date:

Deadline:
Extd:

11/5/12

Affl. of Writer	Attachments (if any)	No. Pgs.	Index
			411
			412
			413
			414
			415
			416
			417

CRMC-MAD-000516

Docket Name ASBESTOS/1975
Docket Number H-033

	Name and Address (Corp)	Date Submitted	Submission
1.	Motor Vehicle Manufacturing Assn. 320 New Center building Detroit, MI. 48202		
2.	Motor Vehicle Manufacturing Assn. 320 New Center Building Detroit, MI 48202		
3.	The Markham Company, Inc. 1184 Alden Road Orlando, Fla. 32803		
4.	3M Company 3M Center St. Paul, Minn. 55101		
5.	Edison Electric Institute 90 Park Avenue New York, N.Y. 10016		
6.	Republic Powdered Metals 2628 Pearl Road Medina, Ohio		
7.	The Breiner Co. P.O. Box 31168 Indianapolis, In. 46231		

Federal Register Cite:
Date:

Ext'd:

HSPR

Affl. of Writer	Attachments (if any)	No. Pgs.	Indexing
			4118
			4119
			4120
			4121
			4122
			4123
			4124

AL102

Docket Name ASBESTOS/1975
Docket Number H-033

Federal Register Cite:
Date: (11)

Deadline:
Extd:

	Name and Address (Corp)	Date Submitted	Submission	App. of Writer	Attachments (if any)	No. Pgs.	Endline
78.	College of American Pathologists 1775 K Street, N.W. Washington, D.C. 20006						435
79.	Johns-Manville Corp. Greenwood Plaza Denver, Colorado 80217						436
80.	Forbes Rebuilt Automotive Parts Inc. 2712-18 White Settlement Road Fort Worth, Texas 76107						437
81.	Friction Materials Inc. Rear 31 N Haven Street Baltimore, MD. 21224						438
82.	Quality Reconditioning Service, Inc. 3947 Louisa Street New Orleans, La. 70126						439
83.	Occupational Safety Consultants Inc. P.O. Box 4337 Corpus Christi, Texas 78408						440
84.	Lipe-Rollway Corp. 806 Emerson Avenue Syracuse, N.Y. 13201						441

HSPD

AL102

CRMC-MAD-000518

Docket Name ASBESTOS/1975

Docket Number 11-033

	Name and Address (Corp)	Date Submitted	Submission
1.	Call-Pick 15930 South Figueroa Street Gardena, Ca. 90248		
1.	The Hastings Co. P.O. Box 445 King, N.C. 27021		
1.	Westling Manufacturing Co. 3900 Louisiana Circle St. Louis Park, Minn. 55426		
1.	Service Parts & Machine Co. 731 Probandt San Antonio, Texas		
1.	Arrow Automotive Industries P.O. Box 1748 Spartanburg, S.C. 29301		
1.	Custom Clutch & Joint, Inc. 3417 St. Clair Avenue Cleveland, Ohio 44114		
1.	San Antonio Brake & Clutch Service P.O. Box 976 San Antonio, Texas 78206		

Federal Register Cite:
Date:

Deadline:
Extd:

Affl. of Writer	Attachments (if any)	No. Pgs.	Indexing
			432
			433
			434
			435
			436
			437
			438

CRMC-MAD-000519

Docket Name ASBESTOS/1975
Docket Number II-033

Name and Address (Corp)	Date Submitted	Submission
Friction Supply, Inc. 7500 N.E. Eleventh Avenue Portland, OR 97211		
Asbestos Information Association 1660 L Street, N.W. Washington, D.C. 20036		
Eaton Corporation Forge Division Marion Plant 1550 Marion Augusta Road Marion, Ohio 43302		
Industrial Gasket Inc. 801 S. Walker P.O. Box 24048 Oklahoma City, Oklahoma 73124		
Appalachian Gasket Co. P.O. Box 991 Industrial Park, State Line Road Elizabethton, Tenn. 37643		
H.R. Grace & Co. Industrial Chemicals Group 62 Whittemore Avenue Cambridge, Mass 02140		

U

Federal Register Cite:
Date:

(11)

Deadline:
Extd:

HSP

Affl. of Writer	Attachments (if any)	No. Pgs.	Index
			439
			440
			441
			442
			443
			444

AL102

Docket Name

ASBESTOS/1975

Docket Number

H-033

	Name and Address (Corp)	Date Submitted	Submission
04.	H.K. Porter Co., Inc. Porter Building Pittsburgh, Pa.		
05.	Sacoma-Sierra Inc. 961 Fairview Drive Carson City, Nevada 89701		
06.	Cyprus Industrial Minerals Co. Research Laboratory 2435 Military Avenue West Los Angeles, Ca. 90064		
07.	Friction Materials Standards Institute Bergen Hall Office Center E. 210 Route 4 Paramus, N.J. 07652		
08.	Friction Materials Standards Institute Bergen Hall Office Center E. 210 Route 4 Paramus, N.J. 07652		
09.	Lasco Brake Products Corp., Ltd 2615 Magnolia Street Oakland, Calif.		
10.	Office of the Assistant Secretary of Defense for Manpower and Reserve Affairs		

Federal Register Cite:
Date:

Deadline:
Extd:

(67)

HSPD

Affl. of Writer	Attachments (if any)	No. Pgs.	Coding
			445
			446
			447
			448
			449
			450
			451

AL102

CRMC-MAD-000521

Docket Name ASBESTOS/1975
Docket Number H-033

	Name and Address (Corp)	Date Submitted	Submission
98.	Charles W. Fishburn, M.D. 17425 W. Cleveland Avenue New Berlin, WI 53151		
99.	Rockwell International Automotive Operations 2135 West Maple Road Troy, MI 48084		
100.	Asbestos Textile Institute, Inc. P.O. Box 471 131 North York Road Willow Grove, Pa. 19090		
101.	University of Wisconsin Hospitals Center for Health Sciences University of Wisconsin-Madison 1300 University Avenue Madison, WI 53706		
102.	Abex Corp. Friction Products Group Suite 205 1650 W. Big Beaver Road Troy, MI 48084		
103.	Hutco Materials Division 1600 West 135th Street Gardena, Calif. 90249		

Federal Register Cite:
Date:

Deadline:
Extd:

(C-1)

115P2

Affl. of Writer	Attachments (if any)	No. Pgs.	Index
			452
			453
			454
			455
			4 AL102
			457

CRMC-MAD-000522

Docket Name ASBESTOS/1975

Docket Number II-033

	Name and Address (Corp)	Date Submitted	Submission
	Name and Address (Corp)	Submitted	Submission
11.	Standard Automotive Components 10225 Page Industrial Blvd. St. Louis, MO 63132		
12.	Cellulo Company 27 North Avenue East Cranford, N.J. 07016		
	Western States Brake Manufacturing 1902 Potrero Avenue South El Monte, Ca. 91733		
14.	Chassis Products, Inc. Highway 80 West Montgomery, Alabama 36108		
115.	Haveg Industries, Inc. 900 Greenbank Road Wilmington, Delaware 19808		
116.	Alsop Engineering Corp. Milldale, CT 06467		
117.	Beaver Industries Inc. C.P.O. Box 597 Kingston, N.Y. 12401		

0
Federal Register Cite:
Date:

Deadline:
Extd:

(17)

HSFO

Affl. of Writer Affl. of Writer	Attachments (if any) Attachments (if any)	No. Pg.	Indexing
			458
			459
			460
			461
			462
			AL102 ³
			464

CRMC-MAD-000523

Docket Name ASBESTOS/1975
Docket Number H-033

	Name and Address (Corp)	Date Submitted	Submission
18.	Dow Chemical USA Bennett Building 2030 Dow Center Midland, MI 48640		
19.	Natural Resources Defense Council, Inc. 15 West 44th Street New York, N.Y. 10036		
20.	Morplex Division 1300 Morplex Drive Lagrosse, WI 54601		
21.	Armstrong Cork Co. Lancaster, Pa. 17604		
22.	ASARCO Inc. 120 Broadway New York, N.Y. 10005		
23.	American Petroleum Institute 2101 L Street, N.W. Washington, D.C. 20037		
24.	Research and Development Division Fruehauf Corp. P.O. Box 238 Detroit, MI 48232		

✓
Federal Register Cite:
Date:

(71)

Deadline:
Extd:

1/5/80

Affl. of Writer	Attachments (if any)	No. Pgs.	Index
			465
			466
			467
			468
			469
			AL102
			471

CRMC-MAD-000524

Docket Name

ASBESTOS/1975

Docket Number

H-033

	Name and Address (Corp)	Date Submitted	Submission
1.5.	International Paper Co. 220 East 42nd Street New York, N.Y. 10017		
1.6.	Atlantic Richfield Co. Corporate Employee Relations Division Box 2679-T.A. Los Angeles, CA 90051		
1.7.	Pfizer, Inc. 235 East 42nd Street New York, N.Y. 10017		
1.8.	Aeroquip corp./Gustin-Bacon Division Barco Plant 500 North Hough Street Barrington, Illinois		
1.29.	Norplex Division/Universal Oil Products Co. 1300 Norplex Drive LaCrosse, WI 54601		
10.	The B.F. Goodrich Co. 500 South Main Street Akron, Ohio 44316		

Federal Register Cite:
Date:

Deadline:
Extd:

Cib

11580

Affl. of Writer	Attachments (if any)	No. Pos.	Indexing
			<i>472</i> <i>473</i> <i>474</i> <i>475</i> AL102 <i>477</i>

CRMC-MAD-000525

Docket Name

ASBESTOS/1975

Docket Number

H-033

Name and Address (Corp)	Date Submitted	Submission
Name and Address (Corp)	Submitted	Submission
Friction Materials Standards Institute Bergen Hall Office Center E. 210 Route 4 Paramus, N.J. 07652		
A to Z Tire & Battery Box 9138 - 3rd & Adams Amarillo, Texas 79105		
Safeguard Automotive Corp. P.O. Box 985 Tappahannock, Va. 22560		
D. & W. Sales & Service, Inc. 800 W. Main Street P.O. Box 1828 Louisville, Kentucky 40201		
Western Brake 1101 E. Washington Blvd. Los Angeles, CA. 90021		
Thorp, Reed & Armstrong 2900 Grant Building Pittsburgh, Pa. 15219		
SCM Corp. 100 Park Avenue		

0
Federal Register Cite:
Date:

(22)
Deadline:
Extd:

Affl. of Writer Affl. of Writer	Attachments (if any) Attachments (if any)	No. Pgs.	Edino
			478
			479
			480
			481
			482
			483
			484

AL102

CRMC-MAD-000526

Docket Name ASBESTOS/1975
Docket Number H-033

No.	Name and Address (Corp)	Date Submitted	Submission
138.	E. I. DuPont DeNemours & Co. Legal Department Wilmington, Delaware 19898		
139.	Standard Oil Company (Indiana) 200 East Randolph Drive P.O. Box 5910-A Chicago, Ill. 60680		
140.	Billingham Marine & Manufacturing P.O. Box 4367 Portland, OR 97208		
141.	GAF Corporation 140 West 51 Street New York, N.Y. 10020		
142.	SEPCO Corporation P.O. Box 10846 Birmingham, Alabama 35202		
143.	Molded Material Company Ridgeway, Pa. 15853		
144.	Packing Seals and Engineering Co.		
145.	Standard Oil Company of California P.O. Box 1272 Richmond, CA. 94802		

Federal Register Cite:
Date:

Deadline:
Extd:

H.F.O.

Affl. of Writer	Attachments (if any)	No. Pgs.	Index
			485
			486
			487
			488
			489
			AL102
			491
			492

CRMC-MAD-000527

Docket Name

ASBESTOS/1975

Docket Number

H-033

	Name and Address (Corp)	Date Submitted	Submission
46.	Republic Powdered Metals 2628 Pearl Road Medina, Ohio 44256		
47.	Ethyl Corp. Medical Department 451 Florida Street Baton Rouge, LA 70801		
48.	Longhorn Gasket & Supply Co.		
49.	W.S. (Bill) Stuckey, Jr. House of Representative		
50.	Chamber of Commerce of the U.S. National Economic Development Group 1615 H Street, N.W. Washington, D.C. 20006		
1.	Republic Steel Corp. Republic Building P.O. Box 6778 Cleveland, Ohio 44101		
2.	American Telephone & Telegraph Co. 295 North Maple Avenue Basking Ridge, N.J. 07920		

Federal Register Cite:
Date:

Deadline:
Extd:

H.P.D.

Affl. of Writer	Attachments (if any)	No. Pgs.	Coding
			493
			494
			495
			496
			497
			AL102
			499

CRMC-MAD-000528

Docket Name ASBESTOS/1975
Docket Number H-033

Federal Register Cite:
Date: (45)

Deadline:
Extd:

15.	Name and Address (Corp)	Date Submitted	Submission	Affl. of Writer	Attachments (if any)	No. Pgs.	Endir
153.	Fluid Sealing Association 2017 Walnut Street Philadelphia, Pa. 19103						500
154.	Arnold Research Organization Arnold Air Force Station Tennessee 37389						501
155.	Plastics Engineering Co. P.O. Box 758 Sheboygan, WI 53801						502
156.	W.R. Grace & Co. Industrial Chemicals Group 62 Whittemore Avenue Cambridge, Mass. 02140						503
157.	United Paperworkers International Union 163-03 Horace Harding Expressway Flushing, N.Y. 11365						504
158.	Asbestos Textile Institute, Inc. P.O. Box 471 Willow Grove, Pa. 19090						505
159.	A/C Pipe Producers Association Suite 1113 1875 Connecticut Avenue, N.W. Washington, D.C. 20009						506

AL 102
5
CRMC-MAD-000529

[Title] 42 - PROPOSED RULE/COMMENTS

Log Sheet Number AL-102

Docket Name ASBESTOS/1975
Docket Number H-033

Federal Register Cite:
Date: (14)

Deadline:
Extd:

No.	Name and Address (Corp)	Date Submitted	Submission	Affl. of Writer	Attachments (if any)	No. Pgs.	Index
160.	American Mining Congress 1100 Ring Building Washington, D.C. 20036						507
161.	PPG Industries, Inc. One Gateway Center Pittsburgh, Pa. 15222						508
2.	Lowell White 23 East 2000 South Orem, Utah 84057						509
163.	Micro Products Inc. 210 E. Buckingham Road P.O. Box 1528 Garland, Texas 75040						510
164.	American Public Transit Association 1100 17th Street, N. W. Washington, D.C. 20036						511
55.	John Tower United States Senate Washington, D.C. 20510						512
166.	Lloyd Bentsen United States Senate Washington, D.C. 20510						513

AL102

CRMC-MAD-000530

Docket Name

ASBESTOS/1975

Docket Number

H-033

No.	Name and Address (Corp)	Date Submitted	Submission
167.	Vermont Asbestos Group, Inc. P.O. Box 70 Hyde Park, VT 05655		
168.	Organization Resources Counselors 1625 I Street, N.W. Washington, D.C. 20006		
169.	Shipbuilders Council of America Watergate Six Hundred Washington, D.C. 20037		
170.	Bethlehem Steel Corp. Bethlehem, Pa. 18016		
171.	Palmer Asphalt Company 196 West 5th Street Bayonne, N.J. 07002		
172.	Abex Corp; Friction Product Group P.O. Box 607 Winchester, VA. 22601		
173.	New Jersey Turnpike Authority New Brunswick, N.J. 08903		
174.	National Paint & Coatings Association 1500 Rhode Island Avenue, N.W. Washington, D.C. 20036		

Federal Register Cite:
Date:

Deadline:
Extd:

(27)

HSPD

Affl. of Writer	Attachments (if any)	No. Pgs.	Code
			514
			515
			516
			517
			518
			AL102
			520
			521

CRMC-MAD-000531

Docket Name ASBESTOS/1975

Docket Number II-033

No.	Name and Address (Corp)	Date Submitted	Submission
175.	American Trucking Associations, Inc. 1616 P Street, N.W. Washington, D.C. 20036		
176.	homestake Mining Company 650 California Street San Francisco, CA 94108		
177.	Tennessee Valley Authority Chattanooga, Tennessee 37401		
178.	Union Carbide Corp. P.O. Box 579 Niagra Falls, N.Y. 14302		
179.	Thompson, Ogletree and Deskins for R.T. Vandervilt Co. First National Bank Tower Atlanta, GA 30303		
180.	Cellulo Company 27 North Avenue East Cranford, N.J. 07016		
181.	Asbestos Information Association 1660 L Street, N.W. Washington, D.C. 20036		

Federal Register Cite:
Date:

Deadline:
Extd:

HSPD

Affl. of Writer	Attachments (if any)	No. Pgs.	Page
			52.7
			523
			524
			525
			526
			527
			528

AL102

CRMC-MAD-000532

Docket Name

ASBESTOS/1975

Docket Number

H-033

Federal Register Cite:

Date:

Deadline:

Extd:

No.	Name and Address (Corp)	Date Submitted	Submission	Affl. of Writer	Attachments (if any)	No. Pgs.	Code
182.	Rubber Manufacturers Association 1901 Pennsylvania Avenue, N.W. Washington, D.C. 20006						529.
183.	Tile Council of America, Inc. P.O. Box 326 Princeton, N.J. 08540						530
184.	Arent, Fox, Kintner, Plotkin & Kahn for: Firestone Tire & Rubber Co. 1815 H Street, N.W. Washington, D.C. 20006						531
185.	Johns-Manville Corporation Greenwood Plaza Denver, CO 80217						532
186.	State of New York Department of Commerce 99 Washington Avenue Albany, N.Y. 12245						533
187.	American Petroleum Institute 2101 L Street, N.W. Washington, D.C. 20037						534
188.	Air Transport Association of America 1709 New York Avenue, N.W. Washington, D.C. 20006						535

CRMC-MAD-000533

AL102

Docket Name ASBESTOS/1975

Docket Number H-033

Name and Address (Corp)	Date Submitted	Submission
Braver Industries, Inc. C.P.O. Box 597 Kingston, New York 12401		
Alsop Engineering Corporation Middale, Connecticut		
Alsop Engineering Corporation Middale, Connecticut		
ASTM 1916 Race Street Philadelphia, Pennsylvania 19103		
Asbestos Information Association 1835 K Street, N.W. Washington, D.C. 20006		
Asbestos Information Association 1835 K Street, N.W. Washington, D.C. 20006		
Congress of the United States House of Representatives Washington, D.C. 20515		
Cahners Publishing Company, Inc. 5 South Wabash Avenue Chicago, Illinois 60603		

Federal Register Cite:
Date:

Deadline:
Extd:

(20)

11/12

Affl. of Writer	Attachments (if any)	No. Pos.	(5-11-)
			536
			537
			538
			539
			540
			541
			542
			543

AL102

CRMC-MAD-000534

Docket Name ASBESTOS/1975
Docket Number H-033

	Name and Address (Corp)	Date Submitted	Submission
			/

Federal Register Cite:

Date:

(31)

Deadline:

Extd:

Affl. of Writer	Attachments (if any)	No. Pgs.	HSPD
	Mancuso, T.F. and E.J. Coulter: Methodology In Industrial Health Studies. Arch Environ Health 6:210- 226, (1963)		544/1141
	Selikoff, I.J., Churg, J. and E.C. Hammond: Asbestos Exposure and Neoplasia. J.A.M.A. 188:22-26, (1964)		545/1147
	Selikoff, I.J., Churg, J. and E.C. Hammond: The Occurrence of Asbes- tosis Among Insulation Workers in the United States. N.Y. Acad Sci 132:139-155, (1965)		546/1160
	Enterline, P. and M. Kendrick: Asbestos-Dust Exposure at Various Levels and Mortality. Arch Environ Health 15:181-186, (1967)		547/1140
	Selikoff, I.J., Churg, J. and E.C. Hammond: Asbestos Exposure, Smoking and Neoplasia. J.A.M.A. 204:106-112, (1968)		548/1115
	Murray, H.M.: Report of the Departmental Committee on Compensa- tion for Industrial Diseases. H.M. Stationary Office, London, (1907)		549

AL102

CRMC-MAD-000535

Docket Name ASBESTOS/1975
Docket Number H-033

Federal Register Cite:
Date: (52)

Deadline:
Extd:

Name and Address (Corp)	Date Submitted	Submission	Affl. of Writer	Attachments (if any)	No. Pgs.	HSPD
				Cooke, W.E.: Fibrosis of the Lungs Due to the Inhalation of Asbestos Dust. Brit. J. Med. II p. 147, (1924)		560
				Merewether, E.R.A., and C.W. Price: Report on the Effects of Asbestos Dust on the Lungs and Dust Suppression in the Asbestos Industry. H.M. Stationary Office, London, (1930)		551/909
				Dredsen, W.C., Dalliavalle, J.M., Edwards, T.I. et al: A Study of Asbestosis in the Asbestos Textile Industry. Public Health Bulletin No. 241, p. 126, (1938)		552/129
				British Occupational Hygiene Society Sub-Committee on Asbestos Hygiene Standards for Chrysotile Asbestos Dust. Ann. Occup. Hyg. 11:47-69, (1968)		553
				Berry, J.: Hygiene Standards-Theory and Application. Biological Effects of Asbestos, pp. 145-149, International Agency for Research on Cancer, Lyon, (1973).		553
				Criteria for a Recommended Standard. Occupational Exposure to Asbestos, National Institute for Occupational		

AL102

CRMC-MAD-000536

[Title] 44-PROPOSED RULE/PROPOSAL DOCUMENTATION/REFERENCES

Log Sheet Number

Docket Name ASBESTOS/1975
Docket Number H-033

Federal Register Cite:
Date: (85)

Deadline:
Extd:

Name and Address (Corp)	Date Submitted	Submission	Affl. of Writer	Attachments (if any)	No. Pgs.	Code
				Knox, J.F., Holmes, S., Doll, R. and I.D. Hill: Mortality from Lung Cancer and Other Causes Among Workers in an Asbestos Textile Factory. Brit. J. Industr. Med. 25:293-303, (1968)		556/82-1031
				Lewinsohn, H.C.: The Medical Surveillance of Asbestos Workers. Roy. Soc. Health J. 92:(2) 69-77, (1972)		557/868
				Anderson, H.A., Selikoff, I.J., Lilia, H., and S. Daum: Household Contact Asbestos Neoplastic Risk. Ann N.Y. Acad. Sci. (In Press)		558/618
				Selikoff, I.J., Hammond, E.C., and H. Seidman: Cancer Risk of Insulation Workers in the United States. Bioloical Effects of Asbestos, pp. 209-216, Inter-national Agency for Research on Cancer, Lyon, (1973)		559/1151
				Enterline, P., De Coufle, P. and V. Henderson: Mortality in Relation to Occupational Exposure in the Asbestos Industry. J. Occup. Med. 14:897-903, (1972)		559/1151

AL 102

CRMC-MAD-000537

ASBESTOS/1975

Docket Name _____
Docket Number H-033 _____

	Name and Address (Corp)	Date Submitted	Submission

Federal Register Cite:

Date:

Deadline:

Extd:

(84)

Affl. of Writer	Attachments (if any)	No. Pgs.	
	Selikoff, I.J., Hammond, E.C. and J. Churg: Carcinogenicity of Amosite Asbestos. Arch. Environ Health 25:183-186, (1972) Nicholson, W.J.: Recent Approaches to the Control of Carcinogenic Exposures: Asbestos-the "TLV" Approach, Mount Sinai School of Medicine of the City University of New York, New York, 10029 Hammond, E.C., and I.J. Selikoff: Relations of Cigarette Smoking to Risk of Death of Asbestos-Associated Disease Among Insulation Workers in the United States. Biological Effects of Asbestos, pp. 312-317, International Agency for Research on Cancer, Lyon, (1973) Wagner, J.C., Sleggs, C.A. and P. Manchand Diffuse Pleural Mesothelioma and Asbestos Exposure in the North Western Cape Province. Brit. J. Industr. Med, 17:260-271, (1960) Enticknap, J.B. and W.J. Smither: Peritoneal Tumors in Asbestosis. Brit. J. Industr. Med., 21:20-31, (1964)		HSID 561/1152 562/952 563/509 AL102 1/1271 565/748

CRMC-M-7-000538

[Title] 44-PROPOSED RULE/PROPOSAL DOCUMENTATION/REFERENCES

Log Sheet

Docket Name ASBESTOS/1975

Docket Number H-033

Name and Address (Corp)	Date Submitted	Submission

Federal Register Cite:

Date:

(85)

Dead: ne:

Extd:

Affl. of Writer	Attachments (if any)	No. P.S.	
	Borow, M., Conston, A., Livornese, L.I., and N. Schalet: Mesothelioma Following Exposure to Asbestos a Review of 72 Cases. Chest 64:641-646 (1973).		H212 566/671
	Hammond, E.C., Selikoff, I.J. and J. Churg: Neoplasia Among Insulation Workers in the United States with Special Reference to Intra-Abdominal Neoplasia. Ann. N.Y. Acad. Sci. 132:519-525, (1965)		567/808
	Newhouse, M.L. and G. Berry: The Risk of Developing Mesothelioma Tumors Among Workers in An Asbestos Textile Factory, XVIII International Congress on Occupational Health, Brighton, England, (1975).		568
	Elmes, P.C. and M.J.C. Simpson: Insulation Workers in Belfast. 3. Mortality 1940-66. Brit. J. Industr. Med., 28:226-236, (1971)		AL 102 569/734
	Stell, P.M. and T. McGill: Asbestos and Laryngeal Cancer. Lancet 2:416-417, (1973)		570/1176
	Newhouse, M.L. and G. Berry: Letter to the editor: Asbestos and Laryngeal Cancer. Lancet 2:615, (1973)		571

CRMC-MAD-000539

[Title] 44-PROPOSED RULE/PROPOSAL DOCUMENTATION/REFERENCES

Log Sheet Number 4180

Docket Name ASBESTOS/1975
Docket Number H-033

Federal Register Cite:
Date:

Deadline:
Extd:

(86)

Name and Address (Corp)	Date Submitted	Submission	Affl. of Writer	Attachments (if any)	No. Pgs.
				Selikoff, I.J., Hammond, E.C., and J. Churg: Mortality Experiences of Asbestos Worker 1943-1968. Pneumoconiosis, Proc. Int. Conf. Johannesburg. 1969, pp. 180-186, Oxford University Press, (1970)	572/11
				Howard, S., Kinlein, L.J., Lewisohn, R.C., Peto, J., and R. Doll: A Mortality Study Among Workers in an English Asbestos Factory. XVIII International Congress on Occupational Health Brighton, England. (1975)	573
				Brody, J.E.: New York Times, Sept. 20, 1974	574
				Webster, I.: Asbestos and Malignancy. S.A. Med. J. 47:165-171, (1973)	575/12
				Greenberg, M. and T.A. Lloyd Davies: Mesothelioma Register 1967-68. Brit. J. Industr. Med. 31:91-104, (1974)	576/14
				Lillington, G.A., Jampoe, R.W. and J.R. Differding: Conjugal Malignant Mesotheliomas. New Eng. J. Med. 291:583-584 (1974)	577

AL102

CRMC-MAD-000540

Docket Name

ASBESTOS/1975

Docket Number

H-033

Name and Address (Corp)	Date Submitted	Submission

Federal Register Cite:
Date:

Deadline:
Exts:

(57)

Affl. of Writer	Attachments (if any)	HS. Pas.	115PD Cde
	Harries, P.G.: Asbestos Hazards in Naval Dock Yards. Ann. Occup. Hyg. 11:135-145, (1968)		576/...
	Whitwell, F. And Rawcliffe M.: Diffuse Malignant Pleural Mesothelioma and Asbestos Exposure. Thorax 26:6, (1971)		579/12
	McEwen, J., Finlayson, A., Mair A. and A.A.M. Gibson: Mesothelioma in Scotland, Brit. Med. J. 4:575-578, (1970)		582/901
	Stumphius J.: Epidemiology of Mesothelioma on Walcheren Island. Brit. J. Industr. Med., 28:59-66, (1971).		581/1179
	Sheers, G. and A.R. Templeton: Effects of Asbestos in Dockyard Workers. Brit. Med. J. 7:574-579, (1968)		582/1163
	Fletcher, D.E.: A Mortality Study of Shipyard Workers with Pleural Plaques. Brit. J. Industr. Med., 29:142-145, (1972)		583/1171

AL102

Docket Name ASBESTOS/1975
Docket Number H-033

Federal Register Cite:
Date:

Deadline:
Ext:

(58)

Name and Address (Corp)	Date Submitted	Submission	Affl. of Writer	Attachments (if any)	No. Pgs.	
				Gillam, J.D., Lemen, R.A., Archer, V.E., Wagner, J.K., and J. Dement: Morbidity and Mortality Among Hard Rock Miners Exposed to an Asbestiform Mineral. Ann. N.Y. Acad. Sci. (In Press)		HSD 584
				Edge, J.R.: Asbestos Related Disease in Barrow-in-Furness. Env. Resh. (In Press)		585

AL102

CRMC-MAD-000542

CONTROL LAB.
Inspection and Control Department

JOHNS-MANVILLE

MANVILLE FACTORY

Report No. **6-89655**

Page No. _____

Date **5/8/47**

Subject: **Pyrox "A" (Pyrophyllite) - Substitute for A.P. Pulp - Spec. #61852-1**
Requested by: **Mr. F. L. Hess**
Identification: **Vendor - R. T. Vanderbilt Co.**

RECOMMENDATIONS:

Pyrox "A", an alkali-metal aluminum silicate, is recommended as a direct substitute for the A.P. Pulp used in the manufacture of both 31-9515-1 Compound and Chemstone Cement.

31-9515-1 Compound is further processed into #3-S Cement.

A.P. Pulp is used as an inert filler in Chemstone Cement.

Pyrox "A" is currently being purchased in carload lots for use in "F" Bldg. at \$15.76 per ton delivered, and may be transferred from "F" to "B" Bldg. The A.P. Pulp purchased from C. K. Williams Co. in Easton, Pa., costs \$20.40 per ton delivered, so that there will be a raw material savings of approx. \$4.64 per ton used.

Note: Product Proposal #473, Supplement #1 issued 3/24/47 approves the use of a new white rubber compound #31-9962-2 for the manufacture of a new white 3-S Cement. 31-9962-2 Compound requires no A.P. Pulp in its formulation.

The above recommendations have verbal approval of Research Laboratory.

SUMMARY:

Two batches of 31-9515-1 Compound were milled in "B" Bldg. using Pyrox "A" as a substitute for A.P. Pulp. Compound was churned in 3-S Cement. #189 Cloth was coated with this cement on the Devino Machine. Coated cloth produced satisfactory Kearsarge Gaskets.

DATA:

I - A.P. Pulp and Pyrox "A"

	<u>A. P. Pulp</u>	<u>Pyrox "A"</u>	<u>Spec. 61852-1</u>
Material	Magnesium Silicate	Alkali-Metal Aluminum Silicate	Magnesium Silicate
Moisture	0.16 - 0.34%	-	0.5 Max.
Ignition Loss	19.3 - 21.1%	2.33%	20.0% Max.
Density-#/cu.ft.	40.4 - 41.6	40 - 46.2	45# Max.
Fineness:			
Passing 100 Mesh	98.0 - 100%	100%	100%
" 200 "	93.1 - 96.2%	94 - 98.0%	92% Min.
Color	Grayish White	Grayish White	White to Gray
Cost	\$20.40	\$15.76	-

Approved _____

Report by _____

CRMC-MAD-000543

Inspection and Control Department
JOHNS-MANVILLE

Report No. 6-89655

Page No. 2

Date 5/8/47

MANVILLE FACTORY

Subject: **Pyrox "A" (Pyrophyllite) - Substitute for A.P. Pulp - Spec. #61852-1**
Requested by: **Mr. F. L. Hess**
Identification: **Vendor - R. T. Vanderbilt Co.**

DATA: - Cont'd.

II - Physical Test - 31-9515-1 Compound Containing Pyrox "A"

	<u>Batch</u>	<u>Batch</u>	<u>Control Specs.</u>
Normal:	29-6	29-7	
Durometer	79	79	75 - 85
Tensile Strength	960 p.s.i.	1180 p.s.i.	900 p.s.i. Min.
Elongation	300%	325%	200% Min.

UJP.

cc - Messrs. **F. Ryan**
P. D. Cannon
F. L. Hess
Attn: **A. D. Carlson**
E. R. Williams (2)
Attn: **R. T. Halstead**
Attn: **R. E. Parry**
G. H. Winquist
J. R. Robson
File (3)

CRMC-MAD-000544

Approved My hie REP

Report by **GEORGE A. PICKETT**



Internal Correspondence

To MEMO TO FILE

Date Nov. 13, 1973

From R. P. Carter

Copies File & C

Subject RE: MEETING WITH JOHN O'NEILL - NOVEMBER 8, 1973
MEETING WITH JERRY SCANNELL AND JOHN O'NEILL - NOV. 9, 1973

Several weeks ago, upon learning that John Stender had decided not to appoint a Standards Advisory Committee in connection with the reopening of the asbestos standard, I called Jerry Scannell's office for the purpose of setting up a meeting with Jerry to determine why this decision had been made and what Johns-Manville and the asbestos industry could do to assist OSHA in promulgating a new standard. Jerry Scannell was out of town on business in Hawaii for a period of three weeks and therefore, the meeting could not be set up until November 9.

After a meeting was scheduled with Jerry Scannell for November 9, I was advised that John O'Neill would be delivering a presentation to the annual meeting of the A/C Pipe Producers Association in Washington on November 8. I attended that meeting and had the opportunity to informally speak with John O'Neill in addition to listening to his presentation.

During our informal conversation, John O'Neill indicated that one of the primary reasons for Stender's decision against the establishment of a Standards Advisory Committee was due to the fact that if such a committee was appointed, Dr. Irving J. Selikoff would have to be included as a member of the committee. I got the impression from O'Neill that Stender felt that Selikoff's presence on the committee would impair the functioning of the committee. O'Neill further indicated to me that the thrust of the revision would be the establishment of work practices. I indicated to John that it could conceivably take several years to prepare work practices for each segment of the asbestos industry. John agreed, but indicated that they would attempt to prepare work practices by processes which were common in each segment of the industry. During our informal discussion, John O'Neill mentioned that he had read the first two installments of Paul Brodeur's series of articles in the New Yorker Magazine. John was not happy

CRMC-MAD-000545

MEMO TO FILE
Page 2
November 13, 1973

with these articles as it presented a very one-sided picture of the asbestos industry and was concerned with several unfavorable comments made about certain government employees. During his presentation, John O'Neill made specific reference to the unfair treatment of the asbestos industry in the news media and how only one side of the story was being told, which in his opinion, was quite unfair.

During his presentation before the A/C Pipe Producers Association, John O'Neill was quite candid in his remarks regarding the reopening. I did not get the impression that John O'Neill was speaking from any prepared notes but was rather making off-the-cuff remarks. The key points covered by John O'Neill in his presentation were as follows:

- (1) The OSHA standard for exposure to asbestos dust was written only to prevent asbestosis and was not designed to prevent mesothelioma or cancer.
- (2) The new evidence which OSHA now has is that fibers other than asbestos can cause mesothelioma.
- (3) The British data upon which the current OSHA standard was based is weak and not scientific.
- (4) OSHA wants to re-evaluate the TLV for asbestos.
- (5) When preparing the current asbestos standard, OSHA did not take into consideration the talc mining problem. He indicated that tremolite is not fibrous and it has not been proven that tremolite causes any harm. OSHA therefore, must re-examine the types of asbestos covered. (During this past Summer, R. T. Vanderbilt and Company, a major talc producer, filed a petition with OSHA requesting a modification of the asbestos standard, basically deleting tremolite from the standard.)
- (6) The method of sampling and measurement must be re-examined. In a phase contrast system, it is difficult to differentiate and distinguish fibers.
- (7) The types of respirators permissible must be re-examined. As of April 1, 1974, many respirators will lose their current approval.

CRMC-MAD-000546

MEMO TO FILE
Page 3
November 13, 1973

- (8) OSHA wants to re-examine monitoring.
- (9) Work practices must be developed, evaluated and made mandatory.
- (10) Asbestos is essential in many uses and OSHA has no intent to ban its use. Rather, OSHA is desirous of establishing safe ways of using asbestos.
- (11) John Stender has opted for the use of outside consultants in lieu of appointing a Standards Advisory Committee.
- (12) OSHA wants the new standards to be very clear. One of the strong reasons for reopening the standard is due to a large number of inquiries OSHA has received during the past year and a half for clarifications and interpretations of the standard. It is their conclusion based on the volume of requests that the current standard is not clear.
- (13) The current numerical standard will probably remain unchanged.
- (14) OSHA would like considerable input from industry to assist them in drafting a new standard.

On November 9, Jack Solon and I met with Jerry Scannell at his office. When we arrived, John O'Neill was also present in Jerry Scannell's office. Jerry indicated that he was currently in the process of preparing a written proposal to John Stender which would consist of a procedure to draft and promulgate a revised asbestos standard. This proposal would be in lieu of the establishment of a Standards Advisory Committee, in view of the fact that Stender had rejected the establishment of such a committee. Jerry's recommendation to Stender will be for OSHA to prepare a draft of a new asbestos standard which would take at least three to four months. Then OSHA would use outside consultants, individuals picked from industry and labor, to be used by OSHA on an individual basis. For example, Scannell would propose contacting AIA to receive recommendations for individuals to be used as consultants. At individual meetings with these consultants, OSHA would discuss particular portions of the proposed revisions with experts in specific areas. After OSHA has met with these consultants they would then arrange to visit various plants in the asbestos industry to determine the practicality of the revised standard. Jerry Scannell indicated that he had

CRMC-MAD-000547

MEMO TO FILE
Page 4
November 13, 1973

received a ruling from their attorneys to the effect that such a plant visit could not be the basis for an OSHA citation. Jerry was quite concerned that various companies might object to OSHA's presence in a plant due to a possible citation exposure. Jerry would like every effort to be made by OSHA to insure their credibility with industry that citations would not be issued as a result of these plant visits. As a matter of fact, he would attempt to work out an arrangement with OSHA enforcement people so that no plant inspections would be made in those establishments visited for a period of at least one year after their plant visit. Following the plant visits, OSHA might perhaps meet on a group basis with all of the consultants for the purpose of reviewing a final draft of the proposed regulations. During the entire process, the proposed regulations would be revised and altered informally as necessary. The final step would be the publication of a new proposed standard in the Federal Register, which probably would not take place before a period of one year from now. At the time the new proposed regulations are published, OSHA might announce a hearing date at that time if they feel there will be substantial comments or objections to the proposal. Jerry indicated it was conceivable that if no meaningful objections were made to the proposal, no hearing at all might be scheduled.

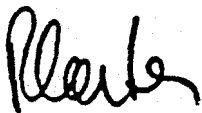
Towards the conclusion of our meeting, Jerry Scannell indicated that there were several things he would like from J-M:

- (1) A letter on how we would like the asbestos standard modified. For example, what aspects of the standard are currently unclear or impractical.
- (2) Provide OSHA with suggestions for improving monitoring and fiber counts, perhaps including a proposal for scrapping fiber counts.
- (3) How can OSHA get Labor and Management together to discuss a new proposed standard without such a meeting being conducted on an adversary basis.
- (4) After Ed Fenner establishes a Technical Committee within AIA, Ed Fenner should contact John O'Neill to discuss whatever assistance the Technical Committee can give him in drafting a new standard.

CRMC-MAD-000548

MEMO TO FILE
Page 5
November 13, 1973

- (5) Jerry Scannell may need assistance from J-M and other companies in the industry in selling his new proposal to John Stender. In view of the fact that J-M and other companies have sent letters to Stender-advocating the establishment of a Standards Advisory Committee, it might be desirable at some point in time for us to advise Stender that we support Jerry Scannell's new proposal. In this regard, it is my intention to contact Jerry Scannell at the earliest possible time to advise him that J-M fully supports his new proposal to Stender and advise him that we would like to cooperate in any way possible to assist him in selling his proposal to Stender. I will suggest to Jerry that he give consideration to arranging a meeting for J-M with Stender, at which time he should be present, for us to convey our support of his proposal to Stender. The timing of such a meeting should be left to Scannell.



R. P. Carter

P.S. - After dictating this memo, I spoke with Jerry Scannell by telephone at which time he advised me that he had presented his proposal to Stender and Stender had accepted his suggestions. I then asked Jerry if we should either write or call Stender for a meeting to indicate our support of their new proposal. Jerry said the decision was up to us but we should either call for a meeting or present our views in a letter to Stender. It is my present plan to draft a letter to Stender withdrawing our request for the establishment of a 15-man Advisory Committee and supporting Scannell's proposal. I intend to read a draft of this letter to Scannell over the telephone and ask his suggestion as to whether or not the letter should be sent or a personal meeting arranged.

CRMC-MAD-000549



Johns-Manville

Internal Correspondence

Exh 140

To: P. Kotin, M.D.

Date: May 26, 1976

From: E. M. Fenner

Copies: G. W. Wright, M.D.
W. B. Reitze

R. P. Carter

Subject: AMERICAN MINING CONGRESS
NONCOAL OCCUPATIONAL HEALTH COMMITTEE

This committee held its first meeting in Washington on Tuesday, May 25.

The first half of the meeting was a discussion of the purpose and scope of the committee. Then considerable time was devoted to comments on the forthcoming meeting of the Federal Metal and Nonmetal Mine Safety Advisory Committee (see copy of our meeting agenda attached).

An item on the Advisory Committee meeting agenda is the MESA suggested revised standard for exposure to asbestos (copy attached). The critical change they proposed is the substitution of the term "mineral fibers" for asbestos, and the elimination of any definition of asbestos. Literal interpretation of the proposed standard could mean that any naturally occurring mineral fiber which meets their definition: "A fiber is defined as a particle that exceeds 5 microns in length but not 5 microns in width and which has a length to width ratio of at least 3 to 1" could be subject to this ruling.

The chairman of the committee, Bernard R. Roy of Amax Inc., appointed an ad hoc subcommittee consisting of:

C. S. Thompson, Ph.D., R. T. Vanderbilt, Chairman
David J. Smith, M.D., U. S. Steel Corporation
Michael J. Doyle, The Hanna Mining Co.
E. M. Fenner

to prepare AMC's comments on the proposed standard and to determine the most effective way of convincing the committee not to endorse the proposal.

For your further information, lists of the Committee members and those attending the May 25 meeting are attached.

May I please have your comments.

E. M. Fenner

CRMC-MAD-000550

public interest and consistent with the objectives of the National Traffic and Motor Vehicle Safety Act of 1966. Accordingly, NHTSA Temporary Exemption No. 12-1, extending January 1, 1977, is hereby amended to include Motor Vehicle Safety Standard No. 212.

Issued: July 31, 1974, 24 FR 1159 (15 USC 1410), delegation of authority at 43 FR 13111.

Issued on July 31, 1974.

JAMES B. GERJOFF,
Administrator.

(FR Doc 74-17728 Filed 8-2-74; 8:45 am)

DEPARTMENT OF AGRICULTURE

Commodity Exchange Authority

TRADERS IN CHICAGO LIVE CATTLE FUTURES

Release of Names and Transactions

The Department of Agriculture in accordance with the Federal Commodity Exchange Act of 1936 (5 U.S.C. 1211) is hereby authorized to release information disclosed in the records and accounts of all traders in the futures market in the Chicago Mercantile Exchange during the period May 1, 1973 to June 15, 1974, with respect to whom the Secretary has information, together with data concerning futures transactions and positions of each such trader.

Such information was submitted in accordance with section 8 of the Commodity Exchange Act of 1936 (5 U.S.C. 1211) which requires the Secretary upon request of any committee of either house of Congress, acting within the scope of its jurisdiction, to furnish and make public the names and addresses of such traders, together with information concerning their futures transactions. The material submitted covered those traders in reporting status (holding a position of 25 contracts or more in any one live cattle future).

The data will be made available for inspection and copying to anyone upon request at the Commodity Exchange Authority office in Washington, D.C. or its regional office in Chicago. In accordance with the Department of Agriculture fee schedule, copies of the material will be furnished at a charge of 10 cents for each copy of each page.

Issued: July 31, 1974.

ALEX C. CALSWELL,
Administrator,
Commodity Exchange Authority.
(FR Doc 74-17728 Filed 8-2-74; 8:45 am)

Farmers Home Administration
(Designation No. A200)

TEXAS

Designation of Emergency Areas

The Secretary of Agriculture has found that a general need for agricultural credit exists in the following county in Texas:

SWITCH

The Secretary has found that this need exists as a result of a natural disaster consisting of prolonged drought from October 1973 until April 1974; excessive rainfall June 5, 1974; hailstorms May 31 and June 12, 1974; and excessive winds June 7 through June 10, 1974.

Therefore, the Secretary has designated this area as a disaster area for Emergency Loans pursuant to the provisions of the Commodity Credit Corporation and Rural Development Act, amended by Pub. L. 93-237, and the provisions of 7 CFR 1502.3(b) in order that the reconstruction of Government Farm Income that such designation is made.

Applications for Emergency Loans must be received by the Department no later than September 21, 1974, for physical and financial appraisal for production loans. The Secretary will accept applications for Emergency Loans from producers who are unable to obtain credit from other sources. The amount of the loan for loans in the designated area makes it imperative and contrary to the public interest to give advance notice of proposed rule making and invite public participation.

Done at Washington, D.C., this 30th day of July, 1974.

FRANK B. ELLIOTT,
Administrator,
Farmers Home Administration.
(FR Doc 74-17728 Filed 8-2-74; 8:45 am)

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Center for Disease Control

COAL MINE HEALTH

Asbestos Exposure in Surface Coal Mines and Surface Work Areas of Underground Mines; Findings of Fact

Section 101(g) of the Federal Coal Mine Health and Safety Act of 1969 (29 U.S.C. 811(g)), hereinafter referred to as the "Act," provides, in part, that within 60 days after completion of any public hearing on proposed mandatory health or safety standards, the Secretary who held the hearing shall make findings of fact which shall be public.

BACKGROUND

Proposed amendments to mandatory health standards for surface work areas of underground coal mines and surface coal mines (30 CFR Part 71) were developed by the National Institute for Occupational Safety and Health pursuant to section 101 of the Act and transmitted to the Secretary of the Interior for publication in accordance with the Act. The amendments were published under a notice of proposed rule-making on November 7, 1973 (37 FR 23615) and interested persons were afforded a period of 45 days within which to submit written comments, suggestions, and objections and to request a public hearing. On April 18, 1974, the Secretary of the Interior, in accordance with section 101(f) of the Act, published a notice (39 FR 13002)

that objections had been filed to the proposed mandatory health standard for occupational exposure to asbestos stating the grounds for such objections and that a public hearing had been requested. Pursuant to notice, the Department of Health, Education, and Welfare published a notice fixing a time and place of the public hearing to be held for the purpose of receiving relevant evidence on the proposed asbestos standard (39 FR 16912).

HEARING

The hearing was held on June 5, 1974, at the Department of Health, Education, and Welfare, Park Tower Building, at Room 332, Maryland. Presentations were made by the following organizations: International Coal Operators' Association, U. S. Association of Company Agents, Information Systems, Inc., United Mine Workers of America and the Industrial Union of Marine and Shipbuilding Workers of America. A verbatim transcript of the hearing is available for public inspection at the National Institute for Occupational Safety and Health, Park Building, Room 332, 5500 Fishers Lane, Rockville, Maryland.

FINDINGS

On the basis of the evidence presented at the hearing and on other information available to the Department, the Director of the National Institute for Occupational Safety and Health, pursuant to authority delegated from the Secretary and the Assistant Secretary for Health (39 FR 11159), finds that:

1. There is a causal relationship between occupational exposure to airborne asbestos fibers and the development of disease.
2. Asbestos is infrequently used in surface coal mining operations and rarely, if ever, used in surface operations of underground coal mines.
3. There is medical evidence which indicates that even infrequent exposure to airborne asbestos can cause disease.
4. When asbestos is used in coal mining operations, technology exists for maintaining the 8-hour average airborne concentration of asbestos dust to which miners are exposed at or below two fibers (greater than 5 microns in length) per cubic centimeter of air but not to exceed 10 fibers per cubic centimeter more than one hour of each 8-hour day.
5. A standard requiring coal mine operators to maintain the 8-hour average airborne concentration of asbestos dust to which miners are exposed at or below two fibers (greater than 5 microns in length) per cubic centimeter of air but not to exceed 10 fibers per cubic centimeter more than one hour of each 8-hour day, is necessary for the protection of life and the prevention of occupational diseases of miners.

Dated: July 31, 1974.

MARCUS M. KRY, M.D.,
Director, National Institute
for Occupational Safety and
Health.

(FR Doc 74-17728 Filed 8-2-74; 8:45 am)

Frank V. Connelly
 Frank V. Connelly, Chief
 Special Rating Branch

Approved:	1962	Aug. 1 - Dec. 31	96 Cases	.....	3	4,393,424.17
	1963	Jan. 1 - Dec. 31	71 Cases	.....	0	373,100.80
	1964	Jan. 1 - March 31	13 Cases	.....		437,968.51
		April 1 - 21	15	.....		56,925.21
		April 22 - May 26	27	.....		75,071.22
		May 27 - June 9	16	.....		46,389.43
	Accumulated Total:		108 Cases			617,009.37
			235 Cases			2,330,617.34
Dated:	1962	Aug. 1 - Dec. 31	99 Cases	.....	0	121,001.35
	1963	Jan. 1 - Dec. 31	10 Cases	.....		156,824.00
	1964	Jan. 1 - March 31	9 Cases	.....		116,995.00
		April 1 - 21	2	.....		1,513.20
		April 22 - May 26	3	.....		3,230.00
		May 27 - June 9	2	.....		3,510.00
	Accumulated Total:		16 Cases			123,178.20
			95 Cases			411,090.55
Accumulated Processed:			320 Cases			2,791,644.89

SPECIAL RATING BRANCH
 APPROVED AND DELETED AS-2 RATING
 June 3 - 9, 1964

0

SPECIAL RATING BRANCH

AA-2 RATINGS

June 3 - 9, 1944

BRANCH	DATE REC'D	DATE CLD	APPLICANT	SUPPLIER	MATERIAL	VALUE
Gov't	6-2	6-3	City of Long Beach	C.W. Pettifer	2 inch and under No. 1 boards & sheathing for form lumber	350.00
Gov't	6-3	6-3	Defense Plant Corp.	Holand Co. Inc.	Radiators	3,300.00
Plumb- ing & Heating	6-3	6-3	A-B Stoves Inc.	Leeds & Northrup Co.	#40636 Microman Recording Controllers	720.00
WFA	6-1	6-2	Charns Co.	Heidritter Lumber Co.	Lumber , 2x8s	600.00
WFA	6-2	6-3	Krazos Valley Cotton Oil Co.	--	Sheathing yellow pine or fir	6,025.00
Spec. Surv.	6-3	6-5	Commanding General 70 th Inf. Div.	Dealer, Industrial Electric Co.	Combination radio photograph sets in steel	3971.00
WFA	6-5	6-5	Quaker City Cold Storage Co.	Leeds & Northrup Co.	R-21 AX metal scales etc.	13,000.00
Chas.	6-5	6-6	Drug Stinoway Co.	Joseph Lumber Co.	White pine	600.00
Lumber	6-7	6-7	R.E. Williams Lumber Co.	--	Douglas fir Lumber	2,200.00
Lumber	6-8	6-8	West Penn Power Co.	Gray Lumber Co.	Yellow pine	2,000.00

20 Cases 29,122.00

CRMC-MAD-000553

CRM-MAD-000554

1 Case 2,900.00

File Unit Dockets 2,900.00

Y. L. E.

MATERIAL

Chem. 5-9 International Paper Co. R.T. Louisville

SUPPLY

DATE DATE
BANKER RECORDS SYSTEM

June 3-9, 1966

MA-2 DE TALS

RECEIVED MAILING SERVICE

0

III. Influences

A. External

1. Labeling--During June of 1974 we discussed with various customers the possibility of labeling our talc products. This resulted in an immediate loss of some accounts. Letters were sent to our customers advising that the label would be affixed to our bags effective November 1, 1974. These letters were sent out in September of 1974. The results of the letter in September and the actual labeling November 1 caused a further loss of customers. Our estimate of lost business on an annual basis was approximately 30 percent of our tonnage and 40 percent of our dollar volume. Please refer to my attached letter to P. Kotin which shows this effect.

R. T. Vanderbilt and Pfizer (California talc) are not labeling. R. T. Vanderbilt is certifying their talcs are asbestos-free, but we have no knowledge that Pfizer is doing the same. We feel that Vanderbilt and Pfizer (California talc) will be required to label before the end of 1975.

The adverse publicity generated concerning asbestos and tremolite has been such that even if we could remove the asbestos label from our talc, it would be some extended period of time, possibly a year or more, before we could regain business lost to asbestos-free talcs.

2. OSHA and NIOSH--Jointly studying asbestos in talc. OSHA has requested NIOSH to study asbestos in commercial talc, and NIOSH is studying asbestos content of talc mines with MESA. NIOSH considers all particles of chrysotile and the amphiboles that have three-to-one aspect ratio and over 5 μ as asbestos fibers. We expect increased activity from state (particularly California) OSHA offices on our talc customers because of tremolite.
3. FDA--Does not appear to be a problem at the moment. Their position stated in the Federal Register March 14, 1975 withdraws their proposed ban of talc in food packaging. The proposed ban drew attention to asbestos in talc and we will have an uphill battle to get back market share we lost.

4. General Market Conditions--See Talc Sales attached

- a. Our ceramic and tile business remains relatively strong in spite of our problems.
- b. Paint is weak due to the economy and our tremolite/labeling problems.
- c. Our plastic business has all but disappeared due to the tremolite problem with the exception of Solo Cup which we started to sell in October of 1974. Solo remains strong but tremolite and the label are an ever present potential problem. Competition from Pfizer is fierce but we manage to hold on because Solo likes our product.
- d. Tremolite, the label, and quality, plus a poor business climate have combined to hurt our sales to the paper industry. Competitors from Montana talcs have been only too eager to point out to our customers that our talcs contain asbestos fiber. This is very rough competition, and coupled with the economy and quality problems, makes for difficult marketing conditions, to say the least.
- e. Price increases--We had planned a six percent price increase for talc on an annual basis. We have implemented a three percent (annual basis) increase and have met great customer resistance. It is doubtful that a six percent will be achieved in 1975. A decision to label by Vanderbilt and Pfizer could reduce the pressure on Desertalc and allow for selective price increases.

B. Internal Influences

- 1. Ore Quality and Control Related to F.P.S.--The problems with ore quality came about when we were forced to above ground mining. The lack of selective mining has caused virtually all of our problems concerning brightness and acid solubles. The Mining Division is formulating a mining plan which should be completed soon to alleviate this problem.

Problems encountered at the milling locations resulting in inability to meet F.P.S. stem primarily from the crude ore being shipped from Warm Springs. This, hopefully, will be corrected by the mining plan mentioned above. Other quality problems were caused by grinds being too coarse and poor plant management. Plans to train and adequately staff quality control personnel have been put into effect by Mining and Research. Plant management and supervision should

improve dramatically when the Mining Division implements their new organization plan for Desert Minerals on April 1, 1975.

IV. Action That We Plan to Minimize Unfortunate Influences

- A. Tremolite and the Label--We are and will continue to educate our customers on the necessity of proper dust control not only for asbestos fiber, but for all dust which is required by OSHA. Our industrial hygiene studies are very helpful in this respect. We believe and are attempting to convince the customers that they must clean up their plants and control dust to comply with OSHA regulations. By so doing, he eliminates the problem of asbestos.

Wherever possible, we discuss bulk shipments to avoid dust problems.

- B. Ore Quality--This problem is critical and compounds our problems with tremolite and the label. We are in constant contact with the Mining Division and communicating our problems in this regard. The formulation and implementation of a good sound mining program, properly supervised, will eliminate this problem area.
- C. Quality Control Problems at Grinding Locations--Good quality crude is paramount, as it is the one area that the grinding plants have no control over. The training of plant quality control personnel so they know what they are looking for and can interpret their results properly will alleviate the problems of coarse grind. This, with better plant management which should be accomplished with the new plant organization, should reduce these problems to a minimum. T. E. Remmers has been assigned the responsibility of the key marketing liaison person to work and communicate to the Mining Division and to follow problem areas through.

V. Recommendations

The initial crunch of lost business due to the label has been felt. Our business seems to have stabilized. We expect further erosion in paint and possibly the loss of Solo Cup in plastics. Our ceramic business remains strong. We believe we can regain some lost paper tonnage with improved quality from Warm Springs and the grinding locations.

During April we will phase out production from Los Angeles and move all production to Dunn. Some Cyclo-Fil may have to be made at Los Angeles on an intermittent basis due to capacities at Dunn. The consolidation of virtually all production at Dunn will cause Dunn to run at capacity for six-day weeks. The concentration of managerial personnel at Dunn should improve the plant's efficiency and eliminate

many quality, shipping, and outage problems we have been experiencing.

The costs used to arrive at net earnings with the revised forecast were submitted by the Mining Division. The cost includes the fixed cost for the Los Angeles Plant, which are estimated at \$200,000 per year while closed down. If we were to dispose of this plant the fixed cost would be eliminated. The cost of operating Dunn and Warm Springs, in my judgment, appear to be overstated. We have never operated Dunn at full capacity with full management capabilities which should insure better efficiency.

We believe we still have a 45,000-plus ton per year business. Mining Division believes this business concentrated at Dunn will improve our profitability. We would like to stay in the California talc business at least until Penhorwood comes on stream, to maintain continuity in the market. The Desert Minerals operation should be reviewed for profitability progress after May results are in.

If this business, with the changes contemplated over the next two months, can be made profitable, it will remain a good small business as Penhorwood should have virtually no effect on Desert Minerals.

CONFIDENTIAL
Johns-Manville

Internal Correspondence

To: P. A. Martinson - 2W

Date: March 20, 1975

From: R. S. Lamar - 2W

Copies: J. M. Fletcher - 2S H. R. Keefe - 2W J. M. Sharratt - 2S

Subject: AN ASSESSMENT OF THE J-M POSITION WITH TALC

Three years since J-M's entry into the talc business with the acquisition of Desert Minerals Company is time enough for an appraisal of our position. This assessment is broken down into eight sections as follows:

1. The Effects of Labeling: Our position here has been the only acceptable action J-M could take. According to the definitions that are a part of the law, our California talc products all contain asbestos in the form of tremolite. No play on words will change this fact.

Originally, I had felt that if we could maintain the uniquely high brightness and relatively low acid soluble content of G-1 and G-2 talc ores, we could hold onto most of the critical markets, in spite of labeling. I now seriously doubt our ability to do this.

The "talc-asbestos" problem is quite different from the "asbestos-asbestos" problem. In many applications for asbestos, there are no acceptable substitutes. With our asbestos-containing talc, there are numerous possibilities for substitution:

(a) Non-asbestos containing talcs from both Pfizer and Cyprus from Montana sources and

(b) Other extender pigments such as kaolin and calcium carbonate (in paints, for example, and in paper filling uses).

We see this type of substitution being made and long-established markets for Desertalc products evaporating in the process.

CRMC-MAD-000559

2. The R. T. Vanderbilt Position: Their position with respect to labeling must be deliberately perfidious; they cannot be this misinformed. Slim Thompson, their technical director, has a Ph.D. in mineralogy. At the moment, Vanderbilt is misleading their customers and confusing ours with their decision not to label. Ultimately, the truth will out, and they will be forced to label.

Pfizer's position is the same with their California talcs. With all asbestos-containing talcs labeled, far greater value and emphasis in the market will be applied to asbestos-free talcs. I seriously question the capacity of these asbestos-free talcs to satisfy the total market. Also, in some applications, the asbestos-free talcs are just not a suitable substitute quality-wise. For example, in ceramic wall tile (a major market for tremolitic talc) there are few, if any, asbestos-free talcs that show the same forming and firing properties. Penhorwood fires to a brown color due to high iron content. G-1 Fires white due to very low iron content.

Nevertheless, it is a fact that the Montana talc (asbestos-free) business of both Cyprus Industrial Minerals and Pfizer is booming, while we are in the doldrums.

3. Quality: Historically, talc mining has been a high-grading operation with selective mining required to maintain acceptable quality for various uses. This type of selective mining was done successfully for over 25 years at the Grantham Mine. Proper quality and uniformity of ore were seldom, if ever, problems and sizeable markets were built on this foundation of quality.

The unique high brightness of Cyclo-Fil (95% G.E.) was, in the past, properly maintained and a good and profitable market developed for this product in paper filling. With the brightness of current quality Cyclo-Fil dipping as low as 89%, there is no way we are going to maintain this business. Clays and other fillers at half the price of Cyclo-Fil can and are being used.

Other quality considerations relating to high acid soluble content and improper grind have caused an erosion of our paper industry business until virtually nothing remains.

4. Markets: At one time (less than three years ago) sizeable markets for Desortalc products existed in paper, paint, plastics, and ceramics. Both DT-51 and DT-57 were the most widely used fillers in 40% talc-filled polypropylene. We lost this business prior to labeling because of tremolite content. Many of our paint and paper accounts have been lost for the same reason and labeling has accelerated this loss. Labeling, plus the loss of proper quality, has been disastrous.

Ceramic sales of DT-51 have been difficult to maintain. High acid soluble and water soluble contents of G-1 ore have resulted in casting slip gelation and rheological problems. The high acid soluble content of current quality G-1 and G-2 ore has increased the alum demand of both Cyclo-Sorb and Cyclo-Fil in paper applications to the point where, even if we had proper brightness, a paper mill could not afford to use our products.

I can foresee no markets that can be built or rebuilt under present conditions.

5. New Technology: Froth flotation will reduce the tremolite content of G-2 ore to less than 1%, but will not remove all of the tremolite. In such a wet process, acid leaching will increase brightness several points. HIMS could probably also be used to remove even paramagnetic material to improve brightness still further.

Newly developed sand or attritor milling procedures can grind down to a maximum particle size of under 2 microns, but I believe that all of these new techniques are a waste of time as long as we have to label. Also, the relatively high mining costs at Warm Springs, plus the absence of adequate water for these wet processing methods makes the development of other sources more attractive.

6. Penhorwood: Based on detailed testing, we feel certain that Penhorwood talc can be developed as a major source for pitch control and should be directly competitive with Mistron Vapor (Cyprus Industrial Minerals Montana talc). Other markets may be developed for Penhorwood in plastics filling, elastomer reinforcement, and paint. Although in this latter use, the relatively low brightness of Penhorwood is going to be difficult to overcome. If higher brightness grades could be developed from the same mining area, additional markets would become available.

In paint uses, wet color uniformity is a major consideration and must be maintained with Penhorwood talc or any other extender pigment. Analyses of Penhorwood core samples suggest that this may become a major problem.

7. Other Worldwide Talc Sources: With the worldwide decline in the industrial use of tremolitic or asbestos-containing talcs, sources for asbestos-free talc will surely become more valuable. Major sources for this type of ore exist in France, Italy, Spain, India, Red China and other parts of the world. Generally, all of these deposits are selectively mined.

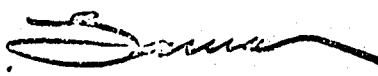
Only Finntalc and Johnson and Johnson are using froth flotation to separate talc products of acceptable quality. We will do the same at Penhorwood, and the industry must move in this direction as deposits amenable to high-grading are depleted.

Talc producing areas in California, Nevada, and Montana have been thoroughly--if not systematically and professionally explored. It is unlikely that new large-scale talc-mining properties could be developed. However, this possibility should be explored--but only for asbestos-free materials. There would appear to be an opportunity for good geological work.

8. Conclusions and Recommendations

- a. Labeling, plus a general decline in quality, has caused a disastrous loss in J-M talc business. Some of this business might be regained in spite of labeling, providing we could re-establish prior high quality standards in both our mining and milling of these products. However, the effects of labeling will always place us in a serious competitive position. The economic viability of such an operation is also highly questionable.
- b. Until Penhorwood is in operation, we should try to hold onto as much of our existing talc business as possible. Such a holding action will be difficult, expensive, and disheartening, but should be done. Penhorwood will not replace all existing markets for Grantham talc because of darker color and other differences.
- c. Beyond the development of Penhorwood, J-M should attempt to develop on a worldwide scale, other asbestos-free sources for talc mineral. These will most surely become more valuable with time.

It would be unfortunate, indeed, if we were to let our poor performance with Grantham talc interfere with J-M development of other worldwide talc sources under more desirable conditions.

R. S. 

ID: 04F-111117

0493A -
info only

what is asbestos?

by James Weldman

A recent workshop on asbestos attracted experts from many disciplines and several nations. Information on current methods and experiments involving asbestos was presented, and many fundamental questions were raised. One basic disagreement centered around a definition of the term "asbestos."

While millions of Americans flocked to beaches and lemonade stands for relief from the mid-July heat wave, distinguished scientists from the U.S. and abroad turned the sweltering conditions to gather at the 500-acre complex of the National Bureau of Standards (NBS) in Gaithersburg, Maryland. In a sense, the torrid weather was an incongruous background for the July 18-20 meeting. The scientists were discussing a heat-resistant material, yes—but not how it might be applied to reduce the threat of heat prostration. Eminent geologists, mineralogists, biologists, industrial hygienists, and physicians had congregated at the NBS-OSHA-sponsored "Workshop on Asbestos" to discuss what factors must be considered by researchers and governmental regulatory agencies when addressing health problems (lung cancer, pleural and peritoneal mesothelioma, and asbestosis) associated with asbestos exposure.

Explaining what OSHA hoped to gain in sponsoring the conference, John Martonik, an industrial hygienist in OSHA's Directorate of Technical Support and champion for the workshop's closing session, said, "We wanted to obtain a variety of opinions concerning the definition of asbestos and the latest methodology for analyzing asbestos-containing fibers." After reviewing the record of comments and questions broached at the conference, OSHA will develop research guidelines for studies to be conducted by NIOSH. OSHA hopes that, when completed, the NBS project will have established for the analysis of

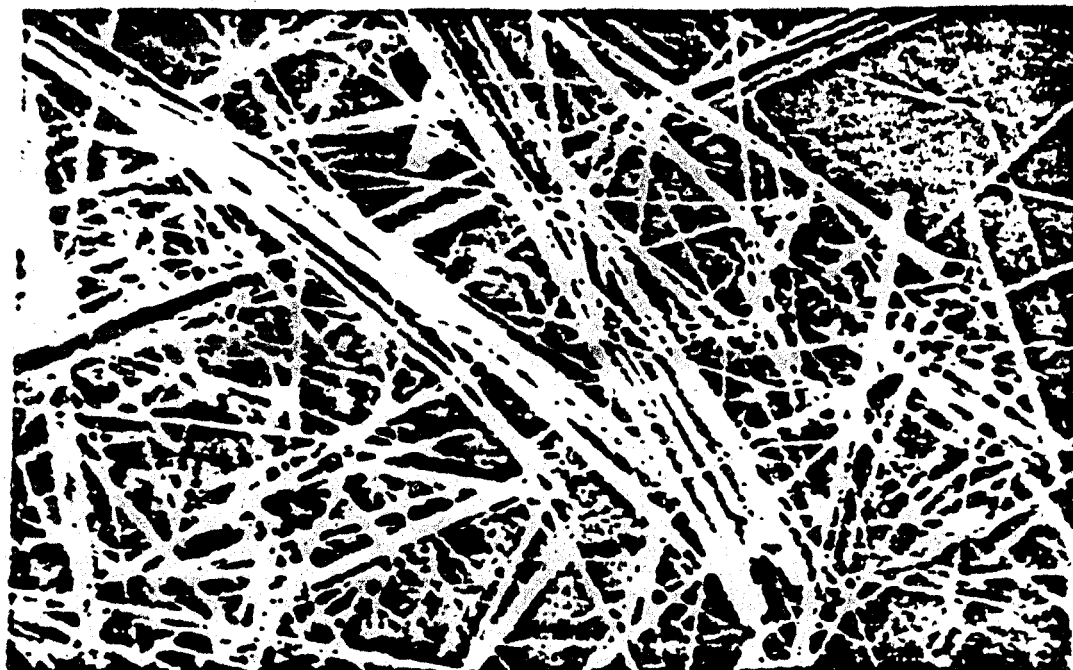
asbestos a "standardized procedure likely to be universally acceptable to the scientific and industrial communities."

The standard procedure also would have to be acceptable to the many government agencies involved in regulating asbestos exposure. In addition to OSHA, the Environmental Protection Agency (EPA), the Food and Drug Administration, the Consumer Product Safety Commission, and the Mining Enforcement and Safety Administration are looking at the problem posed by asbestos exposure as it occurs in their respective regulatory spheres. Nonregulatory agencies such as NIOSH, the National Institute of Environmental Health Sciences, and the National Cancer Institute are also researching the health effects of asbestos exposure. Currently, only EPA has a firmly established procedure for analyzing fibers suspected to be asbestosiform in conducting analyses. OSHA uses a very elaborate series of tests which were recommended by NIOSH. Martonik explains, "Our Salt Lake City laboratory must devote so much of its time to analysis work that there is precious little left in which to develop formal procedures."

While Martonik believes that OSHA can define a project for NBS to pursue in light of information presented at the workshop, any participant who hoped that the conference would settle some of the controversy surrounding asbestos health problems would have left the workshop disappointed. OSHA wanted to hear "a variety of opinions," and that's exactly what it heard. Many problems and questions concerning asbestos

CRMC-MAD-000564

Amosite asbestos fibers as photographed under the scanning electron microscope.



tos were raised by workshop participants; few, if any, were resolved. Indeed, there was a wide difference of opinion as to which of the many questions about asbestos were most important.

One point of agreement

There was, however, one point upon which seemingly all workshop participants agreed—the need for a precise determination of which minerals are, in fact, asbestos or asbestos-form. In the conference's opening presentation, University of Minnesota geologist Dr. Tibor Zoltai noted that, until about five years ago, there had never been a problem with terminology. Before that time, interest in fibrous silicates was pretty much the exclusive domain of geologists, who always understood what their colleagues meant by terms such as "asbestos," "asbestos-form," "fiber," and "fibrous." With the growth of interest in the health problems related to asbestos and the subsequent discussions and research by scientists from other disciplines such as biology, medicine, and chemistry, the fine distinctions inherent in the terms as used by geologists became blurred. Zoltai said. The now-hazy terminology, he said, has led to false or at least sloppy characterization of many minerals as "asbestos" or "asbestos-

form" which were never previously considered as such by mineralogists.

Part of the reason for the present confusion in terminology is the fact that asbestos is not a specific mineral.

In addition to the asbestos minerals named in the OSHA standard, there are several other varieties of asbestos-form minerals—fibrous silicates which have chemical and physical characteristics similar to those of commercial asbestos.

Zoltai called for creation of an "interdisciplinary language" acceptable to researchers in all the scientific spheres now investigating asbestos characteristics and effects. The necessity of having a universal, precise terminology was referred to time and again during the workshop.

In his closing remarks, Dr. C. S. (Slim) Thompson, a mineralogist for the Vanderbilt Company and representative of the American Mining Conference, restated the problem caused by loose terminology. "Everybody knows what asbestos is," he said, "but they don't know what it isn't. . . . Let's call things what they are, not what they are not." Thompson continued, "Minerals must be thoroughly characterized before medical research which has meaning can be

know." Otherwise, he said, the researchers don't know what they are testing, and the government agencies that use the results of these studies as the basis for their standards don't know what they are regulating.

Several possible definitions of asbestos were offered at the workshop. Robert Fisher of U.S. Steel proposed that all silicates which separate into fibers after light grinding be classified as asbestosiform if the fibers meet three criteria: They have a length-to-width ratio greater than 10:1; they have parallel sides; and they are more than two microns in length. Fisher added the caution that mineral fragments are not the same as mineral fibers and that this distinction must be recognized in any regulation.

Dr. Malcolm Ross of the U.S. Geological Survey said there were three possible definitions of asbestos: 1) all silicates with a 3-1 length-to-width ratio; 2) all silicates with a 3-1 length-to-width ratio that are either amphibole or serpentine; and 3) only those silicates known to have commercial value as asbestos. Ross advised regulatory agencies to consider carefully the economic impact of any new regulations. A broadly inclusive definition of asbestos could result in shutting down many hard rock quarrying operations, and "the small mining industries will be wiped out," he claimed.

Confessing to "despair" over the evident confusion in terminology, Dr. Jack Zussman, a mineralogist from the University of Manchester, pointed out one bad effect that the lack of a precise definition of asbestos has on the public: "The fear of labeling of materials as 'asbestos' generates alarm. When we find later that these minerals aren't asbestos, it's too late to undo the harm and worry caused by the original misidentification." Summing up the current state of technical knowledge about asbestosiform minerals, Zussman said, "We pretty well know the effects of commercial asbestos—though they may need to be quantified a bit more. What we don't know, and what we need to proceed with caution on, are the effects, if any, of noncommercial mineral fibers."

A great unknown

One of the biggest questions about asbestos is: Exactly what is it about asbestos fibers that causes adverse health effects? The importance of the precise chemical composition of asbestosiform fibers is largely unknown. Also, though some researchers believe that any fibrous silicate can

OSHA's Asbestos Standard— A Status Report

OSHA's current standard on asbestos was promulgated on June 7, 1972. It defined "asbestos" as:

For regulatory purposes, an asbestos fiber was defined as a particular form of asbestos, known as amphibole.

The 1972 standard originally established a maximum 8-hour time-weighted-average (TWA) concentration of 10 fibers per cubic centimeter (cc), and a ceiling exposure limit of 10 fibers per cubic centimeter. On July 1, 1976, a federal provision of the standard took effect, lowering the permissible 8-hour TWA to 5 fibers per cubic centimeter. This lower limit remains in effect today.

On October 9, 1975, OSHA proposed a new regulation for asbestos. Among other things, the proposal would lower the permissible 8-hour TWA to 2 fibers per cubic centimeter and would reduce the permissible ceiling exposure to 5 fibers per cubic centimeter for any 15-minute period. This proposal would not apply to the construction industry, which would be required to follow a different standard to be proposed later.

A separate asbestos standard for the construction industry has not yet been proposed, nor have hearings on the 1975 proposal been scheduled. An economic impact statement concerning the proposed revision is nearing completion.

Meanwhile, on December 2, 1975, OSHA asked NIOSH to make available information on the health effects of occupational exposure to asbestos. Completed in December of 1976, the NIOSH recommendation was forwarded

NIOSH recommends treating asbestos like other carcinogens by allowing only the lowest exposure level demonstrable by available analytical techniques. This recommendation would require that occupational exposures to asbestos be limited to the lowest level

cause cancer, others believe that virtually any size of asbestos fiber can and lung, thin shape as asbestos fibers.

Another crucial issue that must be resolved is the importance of fiber size in causing disease. Mt. Sinai Hospital's Dr. Arthur Langer noted that, although some studies have produced different results, there is evidence that small fibers (less than five micrometers in length) are biologically active. Taking the opposite position, Dr. Clark Cooper of Equitable Environmental Health, Inc. stated, "We have no acceptable evidence on the pathogenicity of fibers below five micrometers in length. . . . The evidence of short fibers do no cause fibrosis or malignancy."

The importance of fiber size must be taken into account when anticipating any new asbestos regulation. OSHA's current standard, which stipulates that only fibers at least five micrometers long be counted when determining exposure levels, was characterized by Cooper as "flimsy, based on little more than the fact that fibers of this size are visible under the light microscope." However, he pointed out, "For every fiber you can see in the light microscope, there are ten you can see in the electron microscope. No one will be satisfied with an analytical method based on light microscopy alone," he concluded.

But, while Cooper had some reservations about a standard centering on fibers at least five micrometers long, Mount Sinai's Dr. Paul Kotin testified that most fibers making their way into the human body and lodging there are less than 2.5 microns wide and 200 microns long, and greater than 5 microns in length.

Kotin also stated his belief that, though no safe level of asbestos exposure has yet been determined, other means. In asserting that a tolerance threshold will be found, Kotin noted that no epidemiological study has been able to determine the dose amounts suffered during lifetime exposure.

Acceptable risk

While the existence of a tolerance threshold remains a question, regulatory agencies are confronted with a hard decision: how to arrive at establishing a permissible exposure level that is conservatively feasible to attain and at the same

time reduces the risk of disease to a level "acceptable" to those people they are responsible for protecting. Expressing "sympathy" for regulators faced with making this determination for asbestos exposure, Cooper observed, "We know the fibers cause health effects, but we don't have reliable biological data on which to base regulation."

Citing the need for determining what is an acceptable asbestos risk, Cooper continued, "Regardless of whether there is a threshold or not, the odds—not absolutes—are what is important in life. We live in a world of consideration, probability, and acceptable risk. The situation with asbestos is so: analogous to that with vinyl chloride; we're not dealing with a synthetic molecule, but with a physical agent that occurs in nature with a lot of variables." Malcolm Ross reiterated this thought. Noting the pervasiveness of fibrous silicates in American rock formations, Ross warned, "We will have to find an acceptable health risk, or else we will have to shut down the surface of the earth."

A look ahead

At the end of the conference, a comment made from the floor seemed to meet with widespread approval. A workshop participant suggested establishing an interagency taskforce that would periodically review ongoing research projects dealing with asbestos. The taskforce could offer researchers guidance and direction to ensure that they were considering all pertinent variables in their analyses. The taskforce also could serve to avoid overduplication of research by keeping abreast of the multitude of projects being conducted independently by universities, industry, and government. This suggestion was perhaps the one new idea to come out of the three-day conference.

Summing up his impressions of the workshop, Mt. Sinai's Langer said, "We've really learned nothing new. We know we need a lot of research to determine the biological activity of rock-forming silicates, and we know that the whole problem has been muddled by the mixture of terms." Refusing to be overwhelmed by the mass of unanswered questions still surrounding asbestos research, Langer advised, "Remember, this is a very new subject. It's a hell of a big problem, and there's a lot of work to do; this [conference] is just the first round."

James J. Williams is editorial editor of Job Safety and Health.



Johns-Manville

Internal Correspondence

To: E. M. Fenner
R. P. Carter

Date: August 28, 1974

From: G. L. Swallow

F. J. Solon, Jr.
Copies: W. B. Reitze
File & Chron

Subject: CONVERSATION WITH HOWARD J. SCHULTE/OSHA, AND RAY McCLURE/OSHA
REFERENCE: JOHN STENDER'S LETTER OF AUGUST 6, 1974, TO
MR. H. B. VANDERBILT, R.T. VANDERBILT CO., INC.

In response to your request, I called Howard Schulte and discussed with him the subject letter. He was obviously entirely familiar with it.

Mr. Schulte stated that the whole interpretation of the letter hinges upon the definition of "asbestiform" and "non-asbestiform".

In response to my question as to what was the current definition of asbestiform, or differentiation between asbestiform and non-asbestiform, he stated that the definition is the same as previously used in conjunction with the asbestos regulations, specifically that the aspect ratio be 3:1 or greater, and that the length be greater than 5 microns. He amplified his definition by saying that if a talc sample were examined under a microscope and more than 5 artifacts/cc were counted, which fit this definition, it would be termed a violation of the OSHA regulations. When I pressed him concerning the difference between artifacts and tremolite, he stated that, "We cannot take tremolite from the standard at this time." He further stated that OSHA technicians have never seen artifacts which fit the above definition which they consider to be non-tremolitic.

He stated that NIOSH is currently studying the possibility that there do exist non-tremolitic "slivers" which should be differentiated from the tremolitic fibers and which, because they are (perhaps) not a health hazard, should not be counted when evaluating a talc sample. However, the results of this study are one to two years off.

In answer to my query, he stated that the Vanderbilt Company argued the above point, namely that such "slivers" do exist and that it is inaccurate and unfair to include them in any fiber counts associated with talc sampling. He went on to say that despite Vanderbilt's arguments, OSHA was not going along with this concept, unless and until the NIOSH study mentioned above confirmed it.

As our conversation drew to a close, Mr. Schulte suggested that since I had asked so many detailed and technical questions, it would be well for me to talk to Ray McClure. He told me that he would have Ray call me later today.

CRMC-MAD-000568

E. M. Fenner/R. P. Carter
August 28, 1974
Page Two

Later this morning, Ray McClure called and referred to my conversation with Howard Schulte.

He started by explaining that the Vanderbilt mining operations are under the jurisdiction of MESA, not OSHA. Their concern with the OSHA regulations is because of their customers who have read the asbestos regulations and are worried about being cited in their plant operations because of possible tremolitic content in the talc.

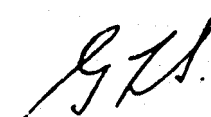
Mr. McClure said that John Stender's letter of August 6, 1974, was an attempt to give some relief for this situation, but doubted that it did so very effectively.

He stated that he was presently urging certain modifications to the standard as presently written. His recommendations are to NIOSH, and must be approved by NIOSH before they can be seriously considered or promulgated. In answer to my question as to what specifically he was recommending, he cautioned me to realize that these were wholly tentative and stated that they were:

1. Revise the aspect ratio in the fiber definition (as associated with talc) from 3:1 to 5:1. He noted that such a recommendation would be contingent upon NIOSH opinion regarding the health aspect.
2. Do not count any fibers whose diameter is greater than 5 microns.
3. Require that the microscopist attempt to make positive identification of fibers as being asbestos particularly by means of observing the fiber end configuration.

He stated that the Salt Lake City laboratory consists chiefly of OSHA people, now, and that the microscopists already attempt to differentiate between true tremolitic fibers and other non-fibrous artifacts which would be classified as fibers if judged only by aspect ratio and length. (Please note the discrepancy between this note and Howard Schulte's)

Mr. McClure stated that if the above changes are successfully promulgated, the standard will probably require sampling by the "asbestos technique" and by impinger. Whether or not a given station is over TLV will be judged by whichever criterion is stricter. OSHA is also considering requiring high volume air samples to permit chemical or mineralogical analysis of the airborne dust.


G. L. Swallow
GLS/jmb

CRMC-MAD-000569

Hiawatha

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
WASHINGTON, D.C. 20210



Office of the Assistant Secretary

August 6, 1974

Mr. H. B. Vanderbilt
President
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 06855

Dear Mr. Vanderbilt:

Your request for an interpretation of the asbestos standard, section 1910.93a, as it related to tremolite talc has been given deep consideration.

The following interpretation of the standard, 1910.93a, is collectively the opinions of both the Occupational Safety and Health Administration and the National Institute for Occupational Safety and Health.

The present asbestos standard is written for the purpose of controlling exposures to the fibrous or asbestiform minerals commonly considered to be asbestos. This is reflected in the established permissible limit for asbestos air contamination to which a worker may be exposed. This is expressed in terms of numbers of fibers in excess of a prescribed length per unit of volume. The required method of determination or analysis is also expressed as a method for counting fibers.

Therefore, nonfibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the existing standard. Talc containing only non-asbestiform tremolite is not regulated by the standard 1910.93a. For emphasis, if only talc and non-fibrous tremolite are present, there is no violation of the asbestos standard. Talc containing asbestiform tremolite or other fibrous asbestos minerals will be regulated by the standard 1910.93a.

Sincerely,

John H. Stender
John H. Stender
Assistant Secretary of Labor

CRMC-MAD-000570

~~F.J.S.~~
~~ANT~~

SAINT LUKE'S HOSPITAL

of the Methodist Church

11311 SHAKER BOULEVARD

CLEVELAND, OHIO 44104

November 30, 1967

Mr. Clint Burnett, President
Johns-Manville Corporation
22 East Fortieth Street
New York, New York 10016

Dear Clint:

The following is with regard to the apprehension voiced by James D. Snell, Jr., M.D., of the Vanderbilt University Hospital with regard to the potential hazard of asbestos fiber in the drinking water from asbestos cement pipe systems.

The current state of our knowledge is essentially as follows. In some reports there has been a suggestion that gastrointestinal cancer may be higher in some groups who have been quite heavily exposed to the inhalation of asbestos fiber as for example the insulation workers and some of the textile plants. It is assumed that the fiber which enters the gastrointestinal tract is that which has been deposited on the mucous surfaces of the nose and trachea and bronchi from whence it is brought up to the back of the throat on a mucous layer and swallowed. Some, of course, may be swallowed with drinking water of contaminated glasses or from the surface of the teeth or mouth cavity. I do not know of any responsible investigator including Cuyler Hammond who believe that there has been a clear-cut demonstration of a higher incidence of death to intestinal cancer in a relationship with asbestos fiber exposure via these routes.

There has been demonstrated an unusually high incidence of peritoneal mesothelioma (cancer of the surfaces covering the intestinal tract) in workers exposed to the inhalation of fiber as for example those involved in insulation work and in textile manufacture. The same appears to be true in populations which on first glance may not be so intimately exposed to the inhalation of fiber as for example some of the natives in certain parts of South Africa who do not actually work in the mines and mills and some of the people who live in parts of the London area where the handling of asbestos fiber is geographically prominent. That some of these or perhaps all have had a moderately heavy exposure to the inhalation of asbestos fiber seems likely because of environmental circumstances with which you are familiar. In any event, they can scarcely be considered chance or occasional exposures to the fiber. My purpose in citing these points is that there is every reason to believe

CRMC-MAD-000571

Mr. Clint Burnett

November 30, 1967

that whatever carcinogenic effects asbestos fiber may have it is a dose related one. Most assuredly there is as yet no evidence to the contrary.

2142
8-10-67
Hard
Water
Condition

The question which is most pertinent now is whether or not the quantity of fiber that might be shed from transite pipe over a period of time would contaminate the water sufficiently to make it reasonable to think that in a lifetime of use of water from such sources a person might ingest enough fiber to conceivably be carcinogenic. I asked Dr. Spiel whether he had any information on the "weathering" of transite pipe and he informed me that although they are making such a study he has no information as yet. I understand from other sources that under some circumstances the inner surface of transite pipe becomes coated with lime and that the surface immediately in contact with the water flowing through the pipe soon becomes that of lime and not asbestos cement at all. We therefore do not know the actual potential for fiber intake by way of the gastrointestinal tract through the media of ingested water. I think most would speculate with me that the number of fibers would be very small and far lower than the number of fibers inhaled, brought back up and swallowed by workers who process and fabricate the fiber and utilize it. If we know that the workers of this latter sort have no clearly demonstrated increased incidence of gastrointestinal cancer, I would think the risk of cancer production from drinking water would be even less by a factor of several thousand.

One other point deserves some mention. While we believe the carcinogenic effects of some kinds of asbestos fiber are dose related, there is also evidence that there is a long lag period between the deposition of the asbestos fiber and the ultimate development of the tumor. This means that over a span of many years the important dose relationship is probably only in the first part of a person's life. Hence, any lifetime ingestion is important in terms of those years prior to the last ten or fifteen years preceding the development of the tumor. Some of this last thought is speculative and I offer it only as a matter to consider.

I took the liberty of calling Dr. Murray C. Brown, Chief of the Occupational Health Program in the National Center for Urban and Industrial Health in Cincinnati about this matter. I wanted to learn from him whether or not the Public Health Service had an official attitude towards asbestos cement pipe. He told me that they were in receipt of a letter from the same Dr. Snell and also Dr. Distowish of Nashville, Tennessee to whom a copy of Dr. Snell's letter to Mr. Lawrence had been sent. He told me that they have

CRMC-MAD-000572

Mr. Clint Burnett

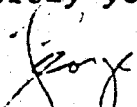
November 30, 1967

answered both of these letters saying essentially that the department does not have an official position at this time, that it has given it some consideration, that it seemed to them the risk was very much lower in the matter of water contamination than in the known problem of air contamination and that they were not in a position even now to make an official statement one way or another. He also told me (not as a part of the letter to Dr. Snell) that there is a list of acceptable pipe and it is his impression that asbestos cement is on that.

I hope these comments will be of some help to you.

With best wishes.

Sincerely yours,


George W. Wright, M.D.
Head, Medical Research
Department

GWW:kal

Copy: Karl V. Lindell

CRMC-MAD-000573

Pipe

John Wright Monday - here for SM discussion? Position paper.

12/18 lunch

1 - Pipe

2 30 Haslam's group.

5 - eight.

11/30 letter out 34 statement.

Dr. P. C. - info re ingestion research.

In J. D. Small Jr and Prof Medicine Vanderbilt U.

Recent reorganization from ~~County~~ ^{City} to Metro-County structure.

infighting.

Geo - now prefers to write Small. (Geo has Vanderbilt outlet)

Strategy - Geo write as what?

JH - write?

Letter to reporter who wrote story?

FSS - feel letter copies to news - council members -

Lawrence Patterson.

✓ Geo - re inhalation exposures - words about re ingestion also

Brief - to ingestion point.

Insert - to minimize build-up.

12/19 mtg.

List of projects.

Other items for agenda?

- IHF Build Living

- Review Study

Phoenix - FSS be glad to keep.

CRMC-MAD-000574

To: F. H. May, Jr., 5 West

Date: May 30, 1975

From: Paul Kotin, M.D., 4 North

Copies: See end of memo

Subject: HEALTH, SAFETY AND ENVIRONMENT
ACTIVITIES REPORT--APRIL 1975

Government Affairs

1. A detailed letter was prepared and filed with the Food and Drug Administration which set forth J-M's objections to the recent FDA regulation banning the use of glass fiber filters in the manufacture of parenteral drugs. In addition, a task force has been established under the chairmanship of S. W. Schulmeyer to identify our needs for data on filter media and to take the necessary steps to acquire those data. George Wright and Richard Carter will represent HS&E on the committee.
2. Another meeting was held with Dr. James Peters, National Cancer Institute, to review plans for the joint TIMA/NCI/NIEHS workshop to develop protocols for testing manmade mineral fibers in animals. Requirements for government support were reviewed and some administrative difficulties in securing funding from the government have been resolved. The conference will be delayed until October 8 to 10 to allow for sufficient notice to conference participants and for preliminary planning.
3. David Mallino and Tom Sliter of the Government Research Corporation met with the HS&E staff to discuss the Toxic Substances Act and Worker's Compensation legislation. In addition, HS&E has been working with the Public Affairs Office on J-M's position with respect to the Helstoski bill (the so-called white lung bill). A meeting with Representatives Helstoski and Fenwick (both N.J.) is under consideration.
4. A meeting was held with Dr. David Rall, NIEHS, and Raymond Shapiro, FDA, to discuss the protocol for the asbestos study. Aspects of the protocol such as design and logistics and preparation of the sample materials were discussed in considerable detail, and our concern with the importance of proper milling and fiber size clearly expressed.
5. Richard Carter, along with Richard Lamar of R&D, met with various officials of R. T. Vanderbilt Company, a J-M talc competitor, to discuss our decision to insert asbestos caution labels on J-M talc and to review the results of our analyses of Vanderbilt talc which we believe contain substantial quantities of asbestos even though Vanderbilt has been certifying to its customers that it does not.

Medical Programs

1. Discussions were held with Lloyd Monroe of Mining Division concerning preemployment physicals for the Stillwater mining operation. Physical examination reports and x-rays have been reviewed for all present employees and a mechanism has been developed for continuing to review examination reports prior to employment in order to eliminate individuals at risk.
2. An additional meeting was held with Dennis Carruth and H. O. McElyea concerning the development of the medical program for the Ken Caryl community. The discussion centered on the types of data that will be necessary before projections can be made; we are in the process now of gathering this information in preparation for future meetings of the committee appointed to coordinate planning.
3. The format for programming data on the Executive Physical Examination Program was finished, and the next step will be inputting the data from our files into the system. We expect that this information will be ready for retrieval by the end of May and that the present delay in the Executive Examinations will be resolved. Target date for effective functioning of the new system is the end of June.
4. The format for the Standardized Employee Health form has been developed with Patient Care Systems. This examination form is to be used on a corporate-wide basis and will allow us to computerize medical information on J-M employees for future data retrieval for epidemiological studies. The forms have been ordered and we expect to be able to institute their use at all J-M locations by August.
5. A standardized form for x-rays using the ILO/UICC 1971 classification of the pneumoconioses has been developed and these forms are now in use. Dr. George Wright is currently reviewing x-rays of employees from our Stockton and Denison plants. These two plants were designed with environmental engineering controls from the beginning of their operations, and the x-ray review should ascertain the effectiveness of these controls.
6. Representatives from HS&E, Employee Relations and Arapahoe Mental Health Center met to discuss the second draft of a proposed "troubled" employee program. Some of the previous problems relating to evaluation techniques have been settled, and we expect to be able to contract with the Arapahoe Mental Health Center for counseling services on a one-year trial basis sometime in June.
7. Revision of the PVC employee audiovisual information program and of the employee booklet on PVC was completed. Review of the physical examination and laboratory reports on employees has begun. This program is only in its beginning stages; however, thus far no problems have been encountered among our employees.

Environmental Activities

1. The first three environmental evaluation visits to plants were completed. This program has involved preliminary meetings with division management personnel, preparation of background information on the status of each plant in the environmental areas and the development of questionnaires for evaluating plants during visits. Detailed reports of the visits to Billerica, Tilton and Nashua were prepared and follow-up meetings with division management to ascertain progress on our recommendations are being planned. Research has begun on the five plants in the Manville complex which are to be evaluated in May.
2. W. B. Reitze visited J-M plants in Belgium, France, Germany and Italy to assess environmental problems. Meetings will be scheduled in May upon Mr. Reitze's return to discuss the status of these plants with division management.
3. The requirements and implications of Federal oil spill prevention regulations were reviewed with appropriate representatives of all operating divisions within the corporation.
4. HS&E assisted the Environmental Engineering Department in connection with the development of a Solid Wastes Survey, and an evaluation of the wastewater diversion and recycling plans for Manville was completed. In addition, a number of environmental projects at specific plant locations and a number of Appropriation Requests were reviewed for their health, safety and environmental impact; these included projects at Toronto, Penbryn, Savannah, No Agua and Waukegan.

Safety

1. David Noyes attended the OSHA Training Institute Course on safety and health training for the construction industry in Chicago and the Colorado Safety Congress held at the Denver Merchandise Mart. Dr. Kotin participated in one of the sessions of the Safety Congress as a panelist.
2. The plant safety contest program was reviewed to improve the use made of the safety data and to develop better means of communicating with employees and management concerning the program.
3. Representatives from Travelers, Marsh McLennan, Insurance Department and HS&E have met to discuss J-M policies and procedures and to clarify our relationship to Travelers and Marsh McLennan. In addition, at the request of the Insurance Department, an article geared to insurance company risk managers outlining J-M efforts in controlling asbestos health problems was prepared for Insurance Magazine.

Communications

1. A special report analyzing recent studies of VCM ingestion was prepared for distribution to district managers and sales representatives for PVC pipe.

2. A bulletin was prepared for the Fiber Glass Division in response to recent media reports on the relationship of fiber glass and health. In this same area, Dr. Gerald Chase met with Dr. Jon Konzen, Owens-Corning, and Mr. Clifford Sheckler, TIMA consultant, to review and analyze the data from the paper on potential fine fiber exposure which David Bayliss presented at the New York Academy of Sciences and which precipitated most of the reports in the media.

Toxicology and Epidemiological Activities

1. A presentation was made to the Standards Committee of the American Water Works Association concerning J-M's PVC pipe migration studies, relevant animal and human data on exposure to vinyl chloride and government agency actions on vinyl chloride. This presentation was made to persuade the American Water Works Association to approve the use of PVC pipe to convey potable water. A determination by the American Water Works Association is expected sometime in May.
2. A meeting was organized at the Fiber Glass Research and Development Center in Waterville to determine the extent of our knowledge concerning thermal degradation and decomposition products from the binders used with our fiber glass products.
3. Thirty-four written and twelve verbal inquiries relating to the toxicology and safe handling of J-M products were answered.
4. A Datapoint 2200 was ordered with the approval of Data Processing. This equipment will provide us with the capability for epidemiological and statistical analysis of research both in-house and outside J-M. In the interim a commitment for time on the Datapoint at Data Processing has been secured so that the groundwork for the HS&E Information System can continue.
5. Past and potential studies of J-M employees were discussed at a meeting with Dr. Philip Enterline at the University of Pittsburgh and the work of the Environmental Sciences Laboratory was reviewed with Dr. William Nicholson at the Mount Sinai Medical Center.

cc: T. R. Smith	E. P. Burke	A. B. Marchant
H. J. White	J. F. Matousek	J. S. Autry
J. A. Consigli	F. L. Page	

CRMC-MAD-000578

File

Johns-Manville

Internal Correspondence

To: P. A. Martinson - 2W

Date: March 20, 1975

From: R. S. Lamar - 2W

Copies: J. M. Fletcher - 2S H. R. Keefe - 2W J. M. Sharratt - 2S

Subject: AN ASSESSMENT OF THE J-M POSITION WITH TALC

Three years since J-M's entry into the talc business with the acquisition of Desert Minerals Company is time enough for an appraisal of our position. This assessment is broken down into eight sections as follows:

1. The Effects of Labeling: Our position here has been the only acceptable action J-M could take. According to the definitions that are a part of the law, our California talc products all contain asbestos in the form of tremolite. No play on words will change this fact.

Originally, I had felt that if we could maintain the uniquely high brightness and relatively low acid soluble content of G-1 and G-2 talc ores, we could hold onto most of the critical markets, in spite of labeling. I now seriously doubt our ability to do this.

The "talc-asbestos" problem is quite different from the "asbestos-asbestos" problem. In many applications for asbestos, there are no acceptable substitutes. With our asbestos-containing talc, there are numerous possibilities for substitution:

(a) Non-asbestos containing talcs from both Pfizer and Cyprus from Montana sources and

(b) Other extender pigments such as kaolin and calcium carbonate (in paints, for example, and in paper filling uses).

We see this type of substitution being made and long-established markets for Desertalc products evaporating in the process.

significant
product
Label

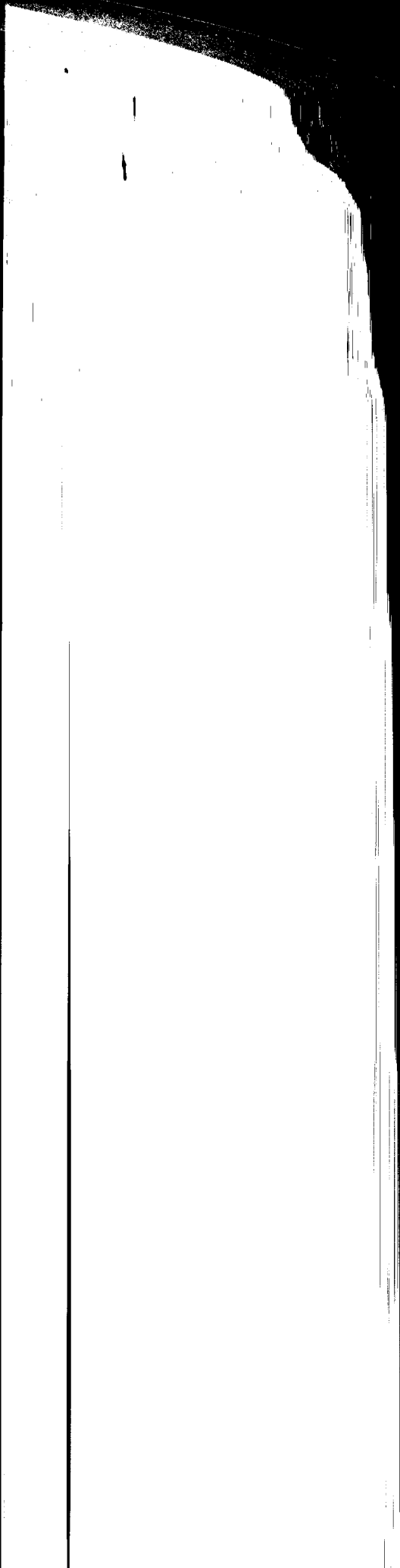
2. The R. T. Vanderbilt Position: Their position with respect to labeling must be deliberately perfidious; they cannot be this misinformed. Slim Thompson, their technical director, has a Ph.D. in mineralogy. At the moment, Vanderbilt is misleading their customers and confusing ours with their decision not to label. Ultimately, the truth will out, and they will be forced to label.

Pfizer's position is the same with their California talcs. With all asbestos-containing talcs labeled, far greater value and emphasis in the market will be applied to asbestos-free talcs. I seriously question the capacity of these asbestos-free talcs to satisfy the total market. Also, in some applications, the asbestos-free talcs are just not a suitable substitute quality-wise. For example, in ceramic wall tile (a major market for tremolitic talc) there are few, if any, asbestos-free talcs that show the same forming and firing properties. Penhorwood fires to a brown color due to high iron content. G-1 Fires white due to very low iron content.

Nevertheless, it is a fact that the Montana talc (asbestos-free) business of both Cyprus Industrial Minerals and Pfizer is booming, while we are in the doldrums.

3. Quality: Historically, talc mining has been a high-grading operation with selective mining required to maintain acceptable quality for various uses. This type of selective mining was done successfully for over 25 years at the Grantham Mine. Proper quality and uniformity of ore were seldom, if ever, problems and sizeable markets were built on this foundation of quality.

The unique high brightness of Cyclo-Fil (95% G.E.) was, in the past, properly maintained and a good and profitable market developed for this product in paper filling. With the brightness of current quality Cyclo-Fil dipping as low as 89%, there is no way we are going to maintain this business. Clays and other fillers at half the price of Cyclo-Fil can and are being used.



Other quality considerations relating to high acid soluble content and improper grind have caused an erosion of our paper industry business until virtually nothing remains.

4. Markets: At one time (less than three years ago) sizeable markets for Desertalc products existed in paper, paint, plastics, and ceramics. Both DT-51 and DT-57 were the most widely used fillers in 40% talc-filled polypropylene. We lost this business prior to labeling because of tremolite content. Many of our paint and paper accounts have been lost for the same reason and labeling has accelerated this loss. Labeling, plus the loss of proper quality, has been disastrous.

Ceramic sales of DT-51 have been difficult to maintain. High acid soluble and water soluble contents of G-1 ore have resulted in casting slip gelation and rheological problems. The high acid soluble content of current quality G-1 and G-2 ore has increased the alum demand of both Cyclo-Sorb and Cyclo-Fil in paper applications to the point where, even if we had proper brightness, a paper mill could not afford to use our products.

I can foresee no markets that can be built or rebuilt under present conditions.

5. New Technology: Froth flotation will reduce the tremolite content of G-2 ore to less than 1%, but will not remove all of the tremolite. In such a wet process, acid leaching will increase brightness several points. HIMS could probably also be used to remove even paramagnetic material to improve brightness still further.

Newly developed sand or attritor milling procedures can grind down to a maximum particle size of under 2 microns, but I believe that all of these new techniques are a waste of time as long as we have to label. Also, the relatively high mining costs at Warm Springs, plus the absence of adequate water for these wet processing methods makes the development of other sources more attractive.

6. Penhorwood: Based on detailed testing, we feel certain that Penhorwood talc can be developed as a major source for pitch control and should be directly competitive with Mistron Vapor (Cyprus Industrial Minerals Montana talc). Other markets may be developed for Penhorwood in plastics filling, elastomer reinforcement, and paint. Although in this latter use, the relatively low brightness of Penhorwood is going to be difficult to overcome. If higher brightness grades could be developed from the same mining area, additional markets would become available.

In paint uses, wet color uniformity is a major consideration and must be maintained with Penhorwood talc or any other extender pigment. Analyses of Penhorwood core samples suggest that this may become a major problem.

7. Other Worldwide Talc Sources: With the worldwide decline in the industrial use of tremolitic or asbestos-containing talcs, sources for asbestos-free talc will surely become more valuable. Major sources for this type of ore exist in France, Italy, Spain, India, Red China and other parts of the world. Generally, all of these deposits are selectively mined.

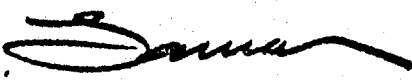
Only Finntalc and Johnson and Johnson are using froth flotation to separate talc products of acceptable quality. We will do the same at Penhorwood, and the industry must move in this direction as deposits amenable to high-grading are depleted.

Talc producing areas in California, Nevada, and Montana have been thoroughly--if not systematically and professionally explored. It is unlikely that new large-scale talc-mining properties could be developed. However, this possibility should be explored--but only for asbestos-free materials. There would appear to be an opportunity for good geological work.

8. Conclusions and Recommendations

- a. Labeling, plus a general decline in quality, has caused a disastrous loss in J-M talc business. Some of this business might be regained in spite of labeling, providing we could re-establish prior high quality standards in both our mining and milling of these products. However, the effects of labeling will always place us in a serious competitive position. The economic viability of such an operation is also highly questionable.
- b. Until Penhorwood is in operation, we should try to hold onto as much of our existing talc business as possible. Such a holding action will be difficult, expensive, and disheartening, but should be done. Penhorwood will not replace all existing markets for Grantham talc because of darker color and other differences.
- c. Beyond the development of Penhorwood, J-M should attempt to develop, on a worldwide scale, other asbestos-free sources for talc mineral. These will most surely become more valuable with time.

It would be unfortunate, indeed, if we were to let our poor performance with Grantham talc interfere with J-M development of other worldwide talc sources under more desirable conditions.

R. S. 

February 21, 1975

Irving J. Selikoff, M.D.
Institute of Environmental Medicine
Mount Sinai School of Medicine
Fifth Avenue and 100th Street
New York, New YORK 10029

Dear Irv:

It was good to talk with you last week, and I can readily appreciate the barrage of calls you received from Toronto--union, Mr. Lewis the M.P.P., and community groups. This situation is clearly relevant to the philosophy we discussed and agreed upon during your visit here--that our energies should be directed to correcting gross plant problems.

The tape of the press conference is being transcribed and I will forward a copy to you along with whatever supplemental information we have available.

As I indicated to you when we met in Chicago, we can develop a mechanism for reviewing the films referred to in Goldfield's article "Dust Control Techniques in the Asbestos Industry." I am glad you agree that this is a good time to initiate some way of reviewing each other's films for mutual education and discussion, etc.

Just for your interest I am enclosing a copy of an internal memo on VCM sign regulations. Please destroy it when you have read it. I think this demonstrates the seriousness of our concern for health and safety--even in minor details.

I have learned that Vanderbilt talc cannot be purchased in New York City but is available in Philadelphia from the following concern:

C. A. Wagner Company
4455 North 5th Street
Philadelphia, Pennsylvania
215/GL7-0600

CRMC-MAD-000584

Dr. Selikoff

-2-

February 21, 1975

Since suppliers are aware of what is happening and word will probably get back to Vanderbilt, I think it would be wise to have someone pick up the talc directly or else have it shipped to someplace other than Mount Sinai.

As I mentioned, I am still pursuing the question of A/C pipe in relation to the duration of its use in selected locations, populations exposed, and the presence of hard or soft water.

Looking forward to seeing you at the Chicago meeting.

Cordially,

Enclosure

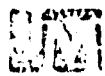
BCC: Dr. Wright
Mr. Solon

CRMC-MAD-000585

Dr. Speil says there is no place
in New York where Dr. Selikoff
can purchase Vanderbilt talc.
However, he can get it in
Philadelphia from

C. A. Wagner Co.
4455 N. 6th Street
GL 7-0600

Dr. Speil says Dr. Selikoff should
have someone pick it up for
him or have it shipped to
someplace other than Mt. Sinai,
as suppliers are "hep" to what
is happening + word will
probably get back to Vanderbilt.



Johns-Manville

Internal Correspondence

To: R. P. Carter
W. A. Cooper
W. B. Reitze

F. J. Solon, Jr.
S. Speil
W. C. Streib

Date:

REC'D	
AUG 1 1974	
JULY 31 1974	
REFER TO	

From: E. M. Fenner

Copies: File & C

Subject: MEETING - 9:00 A.M., AUGUST 6, 1974
DEFINITION OF AN ASBESTOS FIBER - OSHA STANDARD

As you are aware, there has been considerable discussion concerning the definition of an asbestos fiber as presently used by OSHA, particularly in regard to the prescribed aspect ratio of 3 to 1.

ASTM has organized Committee E-34, "Committee on Occupational Health and Safety Aspects of Materials, Physical and Biological Agents". There are a number of subcommittees and task groups within this committee. One of these task groups is concerned with "naturally occurring inorganic fibers".

This task group is presently engaged in writing for submittal to OSHA through normal ASTM channels a revised standard for occupational exposure to asbestos fibers. One of the important sections being written by this task group is concerned with the definition of asbestos fiber.

The next meeting of the Task Group on Naturally Occurring Inorganic Fibers takes place on August 14 and 14 in Canada. I would very much like to be able to submit to the group a Johns-Manville definition of an asbestos fiber.

In order to accomplish this, I am requesting that you attend a meeting to discuss the subject at 9:00 A.M. on Tuesday, August 6, in our Conference Room, 4 North.

For background information prior to the meeting, I enclose the following:

- (1) A letter to F. J. Solon, Jr., describing ASTM Committee E-34.
- (2) A definition for asbestos fiber as prepared by a subsection of the task group for affirmative or negative balloting by the group members.

CRMC-MAD-000587

R. P. Carter, et al
Page 2
July 31, 1974

- (3) A series of definitions of asbestos as previously submitted by the following people:

A. A. Hodgson, Cape Asbestos Fibres Limited
G. Gagnon, Lake Asbestos of Quebec Limited
M. Grimard, M.D., Department of National Health
& Welfare of Canada
R. B. Steele, Asbestos Corporation Limited
A. A. Harvey, R. T. Vanderbilt Company

- (4) A definition of an asbestos fiber as prepared by Dr. Steven Holmes of the Asbestosis Research Council.
- (5) The ASTM present definition of asbestos fiber.
- (6) & (6A) Two anonymous definitions of asbestos.
- (7) An anonymous definition of naturally occurring inorganic fibers.
- (8) A copy of the original proposal for the formation of the Task Group on Naturally Inorganic Fibers.
- (9) A listing of active members of the task group and all others on the mailing list for material.

E. M. Fenner

CRMC-MAD-000588

SUPPLEMENTAL LISTING OF DEFINITIONS

19 April 1974

This listing is a supplement to Document No. 5 published as Appendix 6 of the minutes of the second meeting of the Task Group on Naturally Occurring Inorganic Fibers of ASTM Committee E-34.

1. Definitions submitted by Mr. A. A. Hodgson, Cape Asbestos Fibres Limited, 24 Jan 1974.

fibres Fibres are defined as being of a length greater than $5\mu\text{m}$ and having a length/breath ratio of at least 3:1. There is no upper limit for the length of the fibres, but a maximum diameter of $3\mu\text{m}$ is defined. Airborne asbestos dust concentrations are expressed in fibers per milliliter of air (f/ml).

(taken from the Asbestosis Research Council's Technical Note 1, paragraph 2.1)

asbestos - acicular silicate mineral, with a structure based on silicon - oxygen tetrahedra, composed of crystals in a predominantly parallel orientation, and distinguished by its ability to split indefinitely from its macro form to individual flexible fibrils having minimum length to breath ratio of 3 to 1 and cross sectional dimensions approaching $0.01\mu\text{m}$.

2. Definitions submitted by Mr. G. Gagnon, Lake Asbestos of Quebec Limited, 28 Jan 1974:

fibre - any material in a form such that it has a minimum ratio of length to average maximum transverse dimensions of 10 to 1.

asbestos fibre - silicate mineral, with a structure based upon silicon - oxygen tetrahedra, that fits the definition of a fibre and is composed of single crystals in predominantly parallel orientation. Common usage also designates a collectivity of asbestos fibres as asbestos fibres.

3. Definitions submitted by Dr. M. Grimard, Chief, Heath Effects Division, Environmental Health Directorate, Department of National Health and Welfare of Canada,

fibre - (definition as applied to minerals): any material which by microscopy presents the following optical characteristics: a filiform or bundle of filiform bodies having a length to diameter ratio of at least 3:1

asbestos fiber - acicular silicate mineral, with a structure based upon silicon-oxygen tetrahedra, that fits the definition of a fiber, and is composed of single crystals in predominantly parallel orientation.

4. Definitions submitted by Mr. A. M. Harvey, Manager, Legal and Products Application, R. T. Vanderbilt Company, Inc., 4 Jan 1974:

mineral fiber - any form of mineral characterized by properties of flexibility and length to width ratio of at least 100, and composed of definite crystal unit cells oriented with respect to a specific axis.

asbestos - is a generic term for a number of hydrated silicate minerals that, when crushed or processed, separate into flexible fibers made up of fibrils. These minerals include chrysotile, crocidolite, amosite, anthophyllite asbestos, tremolite asbestos and actinolite asbestos.

5. Definitions submitted by Mr. R. B. Steele, Laboratory Services Engineer, Product Research and Development Department, Asbestos Corporation Limited, 5 March 1974:

Fibril - Is a polymeric form of solid whose component repeating sub-units extend along a single major axis, and which can not be subdivided along this longitudinal axis without destroying the integrity of the structure.

Fiber - Is a bundle of fibrils in parallel alignment, the composite possessing a maximum diameter of 100 microns, and a minimum aspect ratio of 20.

Asbestos - Is a generic term for a number of silicate minerals, the morphology of whose component particles fits the definition of a fiber.

Asbestos Fiber - Is a fiber belonging to one of the six types of asbestos minerals: chrysotile, crocidolite, amosite, anthophyllite asbestos, tremolite asbestos, and actinolite asbestos.

6. Definitions submitted by Mr. A. A. Harvey, Manager, Legal and Products Application, R. T. Vanderbilt Company, Inc., 30 Jan 1974; Definitions taken from pages 26, 27 174 and 175 of the 1973 ASTM Glossary: Refer to page 3.

7. Refer to Appendix 5 and 6 of the minutes of the third meeting of the Task Group on Naturally Occurring Inorganic Fibers.

Public Health and
of 1960. Ac-
Temporary Exem-
January 1, 1977.
to include Motor
Standard No. 212.

e. L. 92-648, 04 Stat. 1159 (15
); delegation of authority at 42
.)

on July 30, 1974.

JAMES B. GREGORY,
Administrator.

Doc. 74-17752 Filed 8-2-74; 8:45 am]

DEPARTMENT OF AGRICULTURE

Commodity Exchange Authority

MEMBERS IN CHICAGO LIVE CATTLE

FUTURES

Use of Names and Transactions

Secretary of Agriculture in re-
sponse to a letter from the Senate Com-
mittee on Agriculture and Forestry sub-
committee on the committee information dis-
semination, the names and addresses of all
in live cattle futures on the Chi-
cago Live Cattle Exchange during the
period from May 1, 1974 to June 15, 1974, with
to whom the Secretary has in-
formation, together with data concern-
ing transactions and positions of
each trader.

Information was submitted in ac-
cordance with section 8 of the Commod-
ity Exchange Act (7 U.S.C. 12-1) which
the Secretary upon request of
the committee of either House of Con-
gress within the scope of its juris-
diction to furnish and make public the
names and addresses of such traders,
together with information concerning
their transactions. The material
covered those traders in re-
sponse to a request (holding a position of 25
or more in any one live cattle

Information will be made available for
inspection and copying to anyone upon
request to the Commodity Exchange Au-
thority in Washington, D.C. or its
office in Chicago. In accordance
with the Department of Agriculture fee
schedule, copies of the material will be
made at a charge of 10 cents for
each page.

July 31, 1974.

ALEX C. CALDWELL,
Administrator,
Commodity Exchange Authority.
Doc. 74-17736 Filed 8-2-74; 8:45 am]

Farmers Home Administration
(Designation No. A060)

TEXAS

Designation of Emergency Areas

Secretary of Agriculture has
determined a general need for agricul-
tural assistance exists in the following county

The Secretary has found that this
need exists as a result of a natural dis-
aster consisting of prolonged drought
from October 1972 until April 1974; ex-
cessive rainfall June 5, 1974; both forms
May 31 and June 13, 1974; and excessive
winds June 7 through June 10, 1974.

Therefore, the Secretary has desig-
nated this area as eligible for emergency
loans, pursuant to the provisions of the
Consolidated Farm and Rural Develop-
ment Act, as amended by Pub. L. 93-237,
and the provisions of 7 CFR 1872.3(b)
including the recommendation of Gov-
ernor Dolph Briscoe that such designa-
tion be made.

Applications for emergency loans must
be received by this Department no later
than September 23, 1974, for physical
losses and April 23, 1975, for production
losses, except that qualified borrowers
who receive initial loans pursuant to this
designation may be eligible for subse-
quent loans. The urgency of the need
for loans in the designated area makes
it impracticable and contrary to the
public interest to give advance notice of
proposed rule making and invite public
participation.

Done at Washington, D.C., this 30th
day of July, 1974.

FRANK B. ELLIOTT,
Administrator.

Farmers Home Administration.

[FR Doc. 74-17735 Filed 8-2-74; 8:45 am]

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Center for Disease Control

COAL MINE HEALTH

Asbestos Exposure in Surface Coal Mines
and Surface Work Areas of Underground
Mines; Findings of Fact

Section 101(g) of the Federal Coal
Mine Health and Safety Act of 1969 (30
U.S.C. 811(g)), hereinafter referred to
as the "Act," provides, in part, that
within 60 days after completion of any
public hearing on proposed mandatory
health or safety standards, the Secre-
tary who held the hearing shall make
findings of fact which shall be public.

BACKGROUND

Proposed amendments to mandatory
health standards for surface work areas
of underground coal mines and surface
coal mines (30 CFR Part 71) were devel-
oped by the National Institute for Oc-
cupational Safety and Health pursuant
to section 191 of the Act and transmitted
to the Secretary of the Interior for pub-
lication in accordance with the Act. The
amendments were published under a no-
tice of proposed rule-making on Novem-
ber 7, 1972 (37 FR 23645) and interested
persons were afforded a period of 45 days
within which to submit written com-
ments, suggestions, and objections and
to request a public hearing. On April 10,
1974, the Secretary of the Interior, in
accordance with section 101(f) of the
Act, published a notice (39 FR 13003),

which stated that the proposed
mandatory health standard for
occupational exposure to asbestos stat-
ing the grounds for such objections and
that a public hearing had been requested.
Following such notice, the Department
of Health, Education, and Welfare pub-
lished a notice fixing a time and place
of the public hearing to be held for the
purpose of receiving relevant evidence on
the proposed asbestos standard (39 FR
16013).

HEARING

The hearing was held on June 5, 1974,
at the Department of Health, Education,
and Welfare's Parklawn Building at
Rockville, Maryland. Presentations were
made by the following organizations:
Bituminous Coal Operators' Association,
R. T. Vanderselt Company, Asbestos In-
formation Association, United Mine
Workers of America and the Industrial
Union Department of AFL-CIO. A ver-
batim transcript of the proceeding is
available for public inspection at the
National Institute for Occupational
Safety and Health, Park Building, Room
3-32, 5600 Fishers Lane, Rockville, Mary-
land.

FINDINGS

On the basis of the evidence presented
at the hearing and on other information
available to the Department, the Director
of the National Institute for Occupa-
tional Safety and Health, pursuant to
authority delegated from the Secretary
and the Assistant Secretary for Health
(35 FR 11130), finds that:

1. There is a causal relationship be-
tween occupational exposure to airborne
asbestos fibers and the development of
disease.

2. Asbestos is infrequently used in sur-
face coal mining operations and rarely,
if ever, used in surface operations of un-
derground coal mines.

3. There is medical evidence which in-
dicates that even infrequent exposure to
airborne asbestos can cause disease.

4. When asbestos is used in coal min-
ing operations, technology exists for
maintaining the 8-hour average air-
borne concentration of asbestos dust to
which miners are exposed at or below
two fibers (greater than 5 microns in
length) per cubic centimeter of air but
not to exceed 10 fibers per cubic centi-
meter more than one hour of each 8-
hour day.

5. A standard requiring coal mine
operators to maintain the 8-hour average
airborne concentration of asbestos dust
to which miners are exposed at or below
two fibers (greater than 5 microns in
length) per cubic centimeter of air but
not to exceed 10 fibers per cubic centi-
meter more than one hour of each 8-hour
day, is necessary for the protection of life
and the prevention of occupational dis-
eases of miners.

Dated: July 31, 1974.

MARCEUS M. KET, M.D.,
Director, National Institute
for Occupational Safety and
Health.

[FR Doc. 74-17872 Filed 8-2-74; 8:45 am]

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
WASHINGTON, D.C. 20210



Office of the Assistant Secretary

August 6, 1974

Mr. H. B. Vanderbilt
President
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 06855

Dear Mr. Vanderbilt:

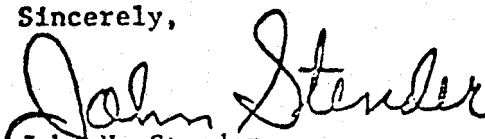
Your request for an interpretation of the asbestos standard, section 1910.93a, as it related to tremolite talc has been given deep consideration.

The following interpretation of the standard, 1910.93a, is collectively the opinions of both the Occupational Safety and Health Administration and the National Institute for Occupational Safety and Health.

The present asbestos standard is written for the purpose of controlling exposures to the fibrous or asbestiform minerals commonly considered to be asbestos. This is reflected in the established permissible limit for asbestos air contamination to which a worker may be exposed. This is expressed in terms of numbers of fibers in excess of a prescribed length per unit of volume. The required method of determination or analysis is also expressed as a method for counting fibers.

Therefore, nonfibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the existing standard. Talc containing only non-asbestiform tremolite is not regulated by the standard 1910.93a. For emphasis, if only talc and non-fibrous tremolite are present, there is no violation of the asbestos standard. Talc containing asbestiform tremolite or other fibrous asbestos minerals will be regulated by the standard 1910.93a.

Sincerely,


John H. Stender
Assistant Secretary of Labor

CRMC-MAD-000592

E. M. Fenner - 4N

January 15, 1974

S. Speil - R&D

TASK GROUP ON NATURALLY OCCURRING INORGANIC FIBERS
ASTM COMMITTEE E-34
Your note of January 11, 1974

You are correct that this is the present ASTM definition. Attached is a copy of the page in the ASTM book giving these definitions. As a matter of fact, the fiber definition is the one that I suggested that Vanderbilt try to get accepted in their proposal to the FDA/Bureau of Mines.

As a matter of information, the definition of asbestos fiber is a good commercial definition, but could lead to serious problems of interpretation. For example, if a microscopist looks at a talc sample and attempts to "count" tremolite fibers what he is counting normally is individual crystals. The tremolite "fibers" are not "composed of single crystals in predominantly parallel orientation"; therefore, these tremolite particles would not be classed as asbestos fiber under the proposed definition.

Under the proposed definition I doubt whether we could even classify many of the crocidolite particles in the UICC sample as asbestos fiber. Finally, if we were to look at a well-dispersed field of chrysotile fibrils, obviously each fibril would not be an asbestos fiber because it is one single crystal but not an assemblage of crystals in predominantly parallel orientation.

While the intent of this definition is excellent in that under it much of the matter, for example in Duluth water, might not be classed as asbestos fiber because it comes from the cleavage of a rock during grinding, the microscopist examining the sample would be put to a difficult task under some circumstances to determine whether the individual crystals that he sees in the microscope field were produced by breaking up a basically massive material or whether they came from separating crystals which originally existed as an assemblage of "single crystals in predominantly parallel orientation".

I hope I haven't confused you by the facts. I am in favor of such a definition, but I foresee difficulties in its interpretation for microscopic studies.

CRMC-MAD-000593



Johns-Manville

Internal Correspondence

To F. J. Solon, Jr.

Date: November 30, 1973

From L. M. Fenner

Copies: File & C

Subject ASTM COMMITTEE E-34

The reorganization of this Committee took place in Houston, Texas, Wednesday and Thursday, November 28 and 29. It is called the Committee on Occupational Health and Safety Aspects of Materials, Physical and Biological Agents. Its main purpose is to write consensus standards that will be approved by the main body of ASTM and forwarded to the Occupational Safety and Health Administration for reissuance or incorporation in OSHA Occupational Standards.

The Committee is subdivided into working Subcommittees in two categories. The first category, which are called Task Force Groups rather than Subcommittees, are charged with the responsibility for writing the standard on a specific material or process. A list of the Task Force Groups is appended to this report.

At the meeting in Houston, I was elected Vice-Chairman of the Task Group on Naturally Occurring Inorganic Fibers, whose main job will be to write standards for asbestos and talc. A list of the attendees at our Task Force meeting is appended.

In addition to the Task Groups there are Subcommittees comprised of experts in specific areas. The function of the Subcommittees is to assist the Task Groups in writing those portions of the document in which they have expertise and later reviewing the initial and final drafts of these portions of the standards. A list of the Subcommittees is attached. I am a member of Committee 34.40 (Engineering Controls).

The main committee meeting was well attended -- approximately 75 people from the major industrial firms in the United States.

Attachs.

CRMC-MAD-000594

Wednesday - November 28, 1973 (Continued)

1:30 - 5:00 PM

Task Force Meetings

(The following T.F.'s will meet concurrently)

Methyl Ethyl Ketone - Sol Levine

Styrene Monomer - Bernard Graboia

Stoddard Solvent - Homer Cole

Carbon Disulfide - Grover Wrenn

Hydrogen Sulfide - John W. Miller

Naturally Occuring Inorganic Fibers - A. A. Winer

Acetone

Carbon Bisulfide

Acrylonitrile

Methyl Cellosolve

Phthalic Anhydride

Ozone

Nickel Carbonyl

Zinc Chromate

3:00 - 5:30 PM

Chairmen of Subcommittees available for questions and discussion.

Thursday - November 29, 1973

8:00 AM

Registration

9:00 - 12:00 AM

Subcommittee Meetings

E34.10 - Definitions and Nomenclature - Henry M. Kissman

E34.20 - Medical - Ernest Dixon

E34.30 - Control - C. W. Schultz

E34.40 - Toxicology - James McNerney

E34.60 - Safety - Darwin E. Rhoads

Thursday - November 29, 1973 (Continued)

E34.70 - Data Collection - A. M. Kooiman

E34.91 - Liaison

E34.92 - Editorial - Fred M. Oberlander

12:00 - 1:30 PM LUNCHEON

1:30 - 4:00 PM E-34 Main Committee

1. Reports

1.1 Executive Subcommittee

1.2 Task Force

1.3 Subcommittees

2. Discussion

3. New Business

4. Next Meeting

5. Adjournment

TASK GROUP ON NATURALLY OCCURRING INORGANIC FIBERS

Dr. A. A. Winer, Chairman
Department of Energy, Mines & Resources of Canada
Mining Processing Division
Ottawa, Ontario, Canada

E. M. Fenner, Vice-Chairman
Johns-Manville Corp.
Denver, CO 80217

Marcel Cossette, Recording Secretary
QAMA Testing Research Laboratories
University of Sherbrooke
Sherbrooke, PQ, Canada

G. J. Foy
Department of National Resources of Quebec
Quebec, PQ, Canada

G. Gagnon
Lake Asbestos of Quebec Limited
Black Lake, PQ, Canada

A. M. Harvey
R. T. Vanderbilt Co.
East Norfolk, Conn.

H. A. Hoffman
Assistant Director of Quality Control
Building Materials Divisions
GAF Corporation
South Bound Brook, N.J.

Kenneth Morgareidge
Food and Drug Research Laboratories, Inc.
Waverly, N.Y.

T. D. Oulton
Englehard Chemical and Mineral Industries
Edison, N.J.

Lake Asbestos

ASTM E-34 (NOIF) X

December 19, 1977

TO: M. Cossette, Q.A.M.A.
E.M. Fenner, J.M.
A.M. Harvey, R.T. Vanderbilt

Gentlemen:

Please find herewith the minutes of a special meeting on geometric parameters for asbestos fibers. Consensus was reached to undertake a limited study on fiber size distribution and preliminary results should be available during the 3rd week of January.

It would be desirable to call a meeting of ASTM Task Group on Asbestos after that time. January 30th was first suggested and written confirmation (or modification) will be sent by Marcel.

Yours truly,



Pierre Laroche

PL/fp

cc: Awiner

NOTES ON THE SPECIAL MEETING ON THE GEOMETRIC PARAMETERS
FOR COUNTING ASBESTOS FIBERS HELD AT THE INSTITUTE FOR
OCCUPATIONAL & ENVIRONMENTAL HEALTH, PLACE VILLE-MARIE,
MONTREAL, QUE., ON DECEMBER 13, 1977.

- 1.0 Participants: see exhibit No. 1.
- 2.0 Agenda: see exhibit No. 2.
- 3.0 The meeting is chaired by Mr. Albert Winer.
- 4.0 Purpose of the meeting:
 - 4.1 As explained by Mr. Winer, the meeting is organized by the ASTM Task Group on Naturally Occurring Inorganic Fibers in order that a special study be undertaken by official Organizations including some Regulatory Bodies. Such a study could eventually lead to a revision of the geometric parameters for counting asbestos fibers and therefore to a better definition of asbestiform minerals.
- 5.0 PARAMETERS TO BE STUDIED
 - 5.1 Mr. Trudeau proposes that the discussion be restricted to technical considerations only and that the biological aspect of the problem should be left to the specialists.
 - 5.2 Messrs Gibbs, Knight and Trudeau propose that distribution of fiber lengths and aspect ratios should be studied from various sample sources.

CRMC-MAD-000599

.....2

5.3 Mr. Grimard suggests that we should study a few values only since fiber counting is the main objective and that practicalness of the technique should be maintained.

5.4 The values selected for the study are shown on the following table:

/aspect ratio/ length	3:1 to 5:1	5:1 to 10:1	10:1 to over
5 to 10 μ m			
10 to 50 μ m			
50 μ m and over			

5.4.1 Mr. Gagan mentions that counting precision beyond 50 micrometers is expected to be poor due to the relatively small number of fibers in that range.

5.5 Mr. Laroche suggests that only fibers having a diameter smaller than 3 micrometers should be considered in the study since thicker fibers are beyond the respirable range.

5.6 Mr. Steel distributes and comments the preliminary results of a U.S.B.M. study on asbestiform tremolite. (see attached exhibit No. 3).

5.6.1 It is also mentioned that similar studies are being done at E.P.A. and U.S. Steel.

CRMC-MAD-000600

.....3

- 5.6.2 Mr. Winer proposes that available results of studies on this subject should be sent to P. Laroche.
- 5.7 Mr. Trudeau remarks that the proposed study could also show that the fiber counting precision is sensitive to a change of the counting parameters.
- 5.8 Mr. Gagan mentions that Environment Canada in their published regulations on asbestos fiber emissions recommend an aspect ratio of 3:1 for fiber counting. He also mentions the reasons supporting their decision i.e. lack of background data supporting 5:1 at that time, possible delay to regulations, etc.....
- 5.9 Mr. Piuze reminds the participants that the prime objective at this time is to collect some data on fiber counting. Results will be analysed at a later meeting and a proposal to maintain or modify the counting parameters could then be formulated by this group.
- 5.10 Mssrs. Piuze and Winer suggest that chrysotile only should be considered in the study. Due to the short time period available, we should maintain the study within a manageable size.
- 5.1 Mr. Gibbs outlines another study that could eventually lead to a counting "protocole" in the Province of Québec for both the primary and secondary asbestos industries. A merging of both studies would be desirable but due to time limit, it will not be possible at this time.

6.0 NUMBER OF SAMPLES AND PARTICIPATING LABS.

- 6.1 Mr. Piuze suggests the following labs: Environment Canada, U.S.B.M., McGill, Ontario Research Foundation, Québec and Q.A.M.A.

- 6.2 Mr. Trudeau mentions that many sample sources are not required if evaluation of the counting precision is the main objective.
- 6.3 Mr. Winer remarks that the sensitivity of the fiber counts to various aspect ratios could be different for different industries.
- 6.4 Mr. Riley suggests that the following manufacturing industries should be included in the study: asbestos-cement, brake lining, asbestos paper and textile.
- 6.5 In order to save on sampling time, Mr. Gibbs suggests that some samples already collected could be obtained either from Québec or from McGill.

7.0 SAMPLING METHOD.

- 7.1 Everybody agrees to the NIOSH membrane filter method.
- 7.2 Mr. Gibbs inquires about funding of the study. Mr. Piuze answers that no funds are available from the Q.A.M.A. right now.

8.0 ORIGIN OF SAMPLES.

- 8.1 It is agreed that samples should tentatively be collected from the following sources:

Cascade Paper (Kingsey Falls, Qué.)
Asbestonos (St-Lambert, Qué.)
Amiante de Sherbrooke (Sherbrooke, Qué.)
Atlas Asbestos (Montréal, Qué.)
Carey Canadian Mines (East-Broughton, Qué.)
Lake Asbestos of Quebec (Black Lake, Qué.)

.....5

8.2 Mr. Trudeau suggests that 2 or 3 samples per source are desirable.

8.3 Mr. Grimard proposes that 2 operators should count the filters at each participating lab.

9.0 SHIPPING OF SAMPLES TO PARTICIPATING LABS.

9.1 Mr. Trudeau agrees to ship the samples to the labs and to supervise the study.

9.2 Mr. Knight agrees to receive and sort the results. He will also arrange the data for statistical analysis at the federal government facilities in Ottawa.

10.0 RULES FOR FIBER COUNTING.

10.1 The NIOSH rules will be observed except that:

10.1.1 Only fibers with a diameter smaller than 3 micrometers will be counted.

10.1.2 200 fibers per filter segment must be counted and the number of fields required to obtain 200 fibers should be reported.

10.2 Mr. Trudeau will send the counting rules together with the samples to the labs.

11.0 TIME SCHEDULE.

11.1 Send the samples within a week.

11.2 Fiber counts should be sent to G. Knight by the second week of January.

CRMC-MAD-000603

.....6

.....6

11.3 G. Knight will tabulate the results during the third week of January (20th January).

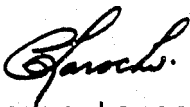
11.4 This Group will meet again to analyse the results one week later.

12.0 MISCELLANEOUS.

12.1 Mr. Steel outlines the works done in U.S.A. on transmission electron microscope (T.E.M.) for counting asbestos fibers. There were large differences in the fiber counts from the 8 labs participating to the original study (i.e. in the range from 0.2 to 8,000 F/cc).

12.2 Mr. Piuze explains some of the advantages of the gravimetric dust measurement techniques (i.e. short-term results, better reliability, etc....).

PL/fp


Pierre Laroche
Acting Secretary

SPECIAL MEETING ON GEOMETRIC PARAMETERS/ASBESTOS COUNTING

LIST OF PARTICIPANTS

<u>NAME</u>	<u>AFFILIATION</u>	<u>ADDRESS</u>
Craigen, Bill	Canmet: Energy, Mines & Ressources	405 Rochester St., Ottawa, Ont.
Gagan, Earl W.	Environment Canada	Air Pollution Control, Ottawa K1A 1C8
Gibbs, Graham	McGill University	3775 University St., Montréal, Qué. H3A 2B4
Grimard, Michel	Health & Welfare Canada (Env. Health Center)	RM 112, Ottawa, Ont. K1A 0L2
Knight, Geoffrey	Quebec Asbestos Mining Association	C.P. 247, Thetford Mines, Qué. G6G 5S5
Laroche, Pierre	Lake Asbestos of Quebec, Ltd.	C.P. 608, Black Lake, Qué. G0N 1A0
Piuze, Lionel C.	Quebec Asbestos Mining Association	C.P. 608, Black Lake, Qué. G0N 1A0
Riley, George	Canmet: Energy, Mines & Ressources	405 Rochester St., Ottawa, Ont.
Steel, Eric B.	U.S. Bureau of Mines	College Park, Maryland 20740
Trudeau, Marc	Quebec Asbestos Mining Association	603, 3 Place Ville-Marie, Montréal, Qué.
Winer, Albert	Canmet: Energy, Mines & Ressources	405 Rochester St., Ottawa, Ont.

CRMC-MAD-000605

EXHIBIT
201

SPECIAL MEETING ON GEOMETRIC PARAMETERS FOR ASBESTOS
COUNTING TO BE HELD AT THE INSTITUTE FOR OCCUPATIONAL
& ENVIRONMENTAL HEALTH IN MONTREAL ON DECEMBER 13, 1977.

AGENDA

1. Introduction - Purpose of the meeting.
2. Parameters to be studied.
3. Number of samples required for the round robin and duplication of the samples.
4. Sampling method.
5. Origin of samples.
6. Who takes the samples?
7. Duplication of samples for counting.
8. Shipping of samples to participants.
9. Counting and results.
10. Analysis of the results and discussions.
11. Report and conclusions.

Authorization No. 9367, Component 1

TABLE 2. - Aspect ratio of particles from milled
blocky, acicular, fibrous, and
asbestiform tremolite

Aspect Ratio	NOT REGULATORY					
	N.	3:1	>5:1	>10:1	>20:1	
	R.	5:1	10:1	20:1	50:1	<50:1
Tremolite	*	Number of Particles				
Blocky	174	13	10	2	1	0
Acicular*	173	8	12	6	1	0
Fibrous	114	37	37	11	1	0
Asbestiform-1	97	13	26	27	27	10
Asbestiform-2	107	7	29	24	26	7

* Low calcium amphibole

1200 X

OPTICAL
MAGNIFICATION

* { LESS THAN 5mm (LENGTH)
LESS THAN 3:1 RATIO
OVER 3mm DIAMETER

ASTM
E-34

X

ASTM COMMITTEE MEETING - APRIL 6th, 1979

ATTENDANCE

<u>NAME</u>	<u>ORGANIZATION</u>	<u>ADDRESS</u>
A. Winner	Canmet (EMR)	Ottawa
Edmund M. Fenner	Johns-Manville	Denver, Co.
Geoffrey Knight	EMR	Elliot Lake
George W. Riley	Canmet (EMR)	Ottawa
Earl W. Gagan	Environment Canada	Ottawa (Hull)
Allan M. Harvey	R.T. Vanderbilt Co.	Norwalk, Ct
W.R. Cooling	Asbestos Corporation	Thetford Mines
G. Foy	Quebec Department of Natural Resources	Québec
Lloyd G. Phelps	Vermont Asbestos Group Inc.	Hyde Park, Vt
J.K. Gilman	Vermont Asbestos Group Inc. (Retired)	Hyde Park, Vt
M. Cossette	Université de Sherbrooke	Sherbrooke
C.S. Thompson	R.T. Vanderbilt Co.	Norwalk, Ct

CRMC-MAD-000608

.../2

Georges Dahmen

Québec Department Natural
Resources
Bureau de l'amiante

845 O. St-Cyrille
Québec

Eric Chatfield

Ontario Research Foundation

Sheridan Park
Mississauga, Ont.
L5K 1B3

Marc Trudeau

Association des mines
d'amiante du Québec

Thetford Mines

Mike Bumbaco

Environment Canada

Ottawa

Dr. M. Alvo

for Applied Statistics
SCS Consultants Inc.
CASD
Environment Canada

Ottawa

GRAHAM GIBBS

McGill

TORONTO



Energy, Mines and
Resources Canada

Energie, Mines et
Ressources Canada

George W. Riley, P. Eng

Manager
Industrial Minerals Laboratory

Canada Centre for Mineral &
Energy Technology

405 Rochester Street
Ottawa, Ontario
K1A 0G1

(613) 996-5619

CRMC-MAD-000609



Johns-Manville

B/U ULP *ASTM X*
Internal Correspondence

To: R. P. Carter
W. A. Cooper
W. B. Reitze

F. J. Solon, Jr.
S. Speil
W. C. Streib

Date: July 31, 1974

From: E. M. Fenner

Copies: File & C

Subject: MEETING - 9:00 A.M., AUGUST 6, 1974
DEFINITION OF AN ASBESTOS FIBER - OSHA STANDARD

As you are aware, there has been considerable discussion concerning the definition of an asbestos fiber as presently used by OSHA, particularly in regard to the prescribed aspect ratio of 3 to 1.

ASTM has organized Committee E-34, "Committee on Occupational Health and Safety Aspects of Materials, Physical and Biological Agents". There are a number of subcommittees and task groups within this committee. One of these task groups is concerned with "naturally occurring inorganic fibers".

This task group is presently engaged in writing for submittal to OSHA through normal ASTM channels a revised standard for occupational exposure to asbestos fibers. One of the important sections being written by this task group is concerned with the definition of asbestos fiber.

The next meeting of the Task Group on Naturally Occurring Inorganic Fibers takes place on August 14 and 14 in Canada. I would very much like to be able to submit to the group a Johns-Manville definition of an asbestos fiber.

In order to accomplish this, I am requesting that you attend a meeting to discuss the subject at 9:00 A.M. on Tuesday, August 6, in our Conference Room, 4 North.

For background information prior to the meeting, I enclose the following:

- (1) A letter to F. J. Solon, Jr., describing ASTM Committee E-34.
- (2) A definition for asbestos fiber as prepared by a subsection of the task group for affirmative or negative balloting by the group members.

CRMC-MAD-000610

R. P. Carter, et al

Page 2

July 31, 1974

- (3) A series of definitions of asbestos as previously submitted by the following people:
 - A. A. Hodgson, Cape Asbestos Fibres Limited
 - G. Gagnon, Lake Asbestos of Quebec Limited
 - M. Grimard, M.D., Department of National Health & Welfare of Canada
 - R. B. Steele, Asbestos Corporation Limited
 - A. A. Harvey, R. T. Vanderbilt Company
- (4) A definition of an asbestos fiber as prepared by Dr. Steven Holmes of the Asbestosis Research Council.
- (5) The ASTM present definition of asbestos fiber.
- (6) & (6A) Two anonymous definitions of asbestos.
- (7) An anonymous definition of naturally occurring inorganic fibers.
- (8) A copy of the original proposal for the formation of the Task Group on Naturally Inorganic Fibers.
- (9) A listing of active members of the task group and all others on the mailing list for material.

E. M. Fenner



Johns-Manville

Internal Correspondence

To: E. M. Fenner - 4N

Date: January 15, 1974

From: S. Speil - R&D

Copies:

Subject: TASK GROUP ON NATURALLY OCCURRING INORGANIC FIBERS
ASTM COMMITTEE E-34
Your note of January 11, 1974

You are correct that this is the present ASTM definition. Attached is a copy of the page in the ASTM book giving these definitions. As a matter of fact, the fiber definition is the one that I suggested that Vanderbilt try to get accepted in their proposal to the FDA/Bureau of Mines.

As a matter of information, the definition of asbestos fiber is a good commercial definition, but could lead to serious problems of interpretation. For example, if a microscopist looks at a talc sample and attempts to "count" tremolite fibers what he is counting normally is individual crystals. The tremolite "fibers" are not "composed of single crystals in predominantly parallel orientation"; therefore, these tremolite particles would not be classed as asbestos fiber under the proposed definition.

Under the proposed definition I doubt whether we could even classify many of the crocidolite particles in the UICC sample as asbestos fiber. Finally, if we were to look at a well-dispersed field of chrysotile fibrils, obviously each fibril would not be an asbestos fiber because it is one single crystal but not an assemblage of crystals in predominantly parallel orientation.

While the intent of this definition is excellent in that under it much of the matter, for example in Duluth water, might not be classed as asbestos fiber because it comes from the cleavage of a rock during grinding, the microscopist examining the sample would be put to a difficult task under some circumstances to determine whether the individual crystals that he sees in the microscope field were produced by breaking up a basically massive material or whether they came from separating crystals which originally existed as an assemblage of "single crystals in predominantly parallel orientation".

I hope I haven't confused you by the facts. I am in favor of such a definition, but I foresee difficulties in its interpretation for microscopic studies.

S. Speil

CRMC-MAD-000612

R. T. VANDERBILT COMPANY, INC.
30 WINFIELD STREET
NORWALK, CONNECTICUT 06855

CABLE ADDRESS
"BILTVAN" NORWALK, CONNECTICUT
TWX 710-466-2940
1203 653-1400

July 18, 1978

Mr. Marcel Cossette
Quebec Asbestos Mining Association
University of Sherbrooke, P.Q.
Sherbrooke, QUEBEC J1K 2R1

Dear Mr. Cossette:

It has come to my attention that the requirement for caution labels as stated in paragraph 5.3.1. of the 12th draft of the ASTM E-34 Standard for Occupational Exposure to Asbestos is unworkable as written.

The wording "caution labels should be affixed to all raw materials, mixtures, scrap, waste, debris, and other products containing asbestos fibers, or to their containers," could be interpreted by the courts, in the absence of any qualifying minimum concentration of asbestos fibers in the product, to mean any concentration above zero. Such an interpretation was taken by the courts in the case GAF Corporation v. OSAHRC and Dunlop (No. 76-1028) in relation to the OSHA asbestos standard requirements for medical exams for exposed employees. The court ruled that "concentrations of asbestos", as stated in the regulation, meant any concentration of asbestos above zero.

Obviously, a similar interpretation of "containing asbestos fibers" for purposes of labeling, would mean that the asbestos warning label would be required on mineral product containers where the concentration of asbestos was in the parts per million range. The possibility that this might happen is supported by a recent finding, through Freedom of Information Requests, of a recommendation by the OSHA Solicitor's office that talcs containing any amount of asbestos be labeled with the official Asbestos Warning Label.

It has been argued that the OSHA requirements for labeling products containing asbestos, which uses essentially the same language as the ASTM draft standard, might be interpreted to mean that only products containing sufficient asbestos "so that during any reasonably foreseeable use, handling, storage, disposal, processing, or transportation, no airborne concentrations of asbestos fibers in excess of the prescribed exposure limits" be labeled. Naturally it would be unreasonable to believe that a product containing, for example, 0.1% asbestos could release more than 2 fibers/c.c. under normal conditions of use. But as long as the language of the standard remains vague or unspecific, the courts, in their efforts to favor the protection of the employee, might easily adopt an attitude similar to that applied in the GAF case.

However, the GAF case points out the need for precise terms in regulations of importance to human life. Circuit Judge MacKinnon, in his concurring opinion in the GAF case criticized the regulation:

29 C.F.R. §1910.1001(b)(1) and (2) (1976). The prescribed standards in these regulations were: "five fibers, longer than 5 micrometers, per cubic centimeter of air," and after July 7, 1976, "two fibers." These standards inform the nation's employers *precisely* what degree of exposure is permitted and what exposure is excessive, but the regulation requiring medical examinations is almost completely deficient in this respect.

What number of fibers, of what length, per what volume of air will constitute a "concentration" is nowhere stated or even hinted at—and like the regulation, the court's opinion leaves the matter completely to conjecture. This is particularly unsettling

to law abiding citizens when the agency is dealing with tremendously minute quantities of infinitesimally small particles. It makes compulsory law enforcement difficult and it lessens the likelihood of voluntary compliance with the law, a result devoutly to be wished. The first requirement for uniform and voluntary compliance with the law is a clear understandable statement of what conduct is required and this regulation falls woefully short of that minimal requirement.

Regulations that have the great importance that this regulation has to human life should be written in more precise terms—so people of ordinary understanding can determine what course of conduct is being required of them. What one person might consider to constitute a "concentration" will differ greatly from the interpretation that another would give to that term; and what one person today might regard *not* to constitute a concentration might be considered tomorrow, on the basis of hindsight as medical knowledge increases, to come within that term.¹

I believe, however, that the Occupational Safety and Health Review Commission should clarify the regulation governing medical examinations so as to give other persons subject to the regulation reasonable notice of some measurable quantity of airborne asbestos the Commission intends to trigger the medical examination requirement. Merely to state that all employers must provide medical examinations whenever their employees are exposed to "concentrations" of asbestos fibers does not provide an ascertainable standard for those who wish to comply with the law.

For the above reasons we believe the language of paragraph 5.3.1. concerning caution labels should read:

CRMC-MAD-000614

Caution labels should be affixed to all raw materials, mixtures, scrap, waste, debris, and other products containing more than 1 percent asbestos on a dry weight basis or to their containers, except that no label is required where asbestos fibers have been modified by a bonding agent, coating, binder, or other material so that during any reasonably foreseeable use, handling, storage, disposal, processing, or transportation, no airborne concentrations of asbestos fibers in excess of the exposure limits prescribed in 5.1 will be released.

This is the same exclusion allowed in the EPA National Emission Standard for Asbestos (Federal Register 38, 8829 April 6, 1973), for spraying, which reads:

(e) Spraying: There shall be no visible emissions to the outside air from spray-on application of materials containing more than 1 percent asbestos, on a dry weight basis, used to isolate

Furthermore, the practice of setting exclusion levels for regulated materials has been followed by OSHA in the case of the 14 carcinogens (29CFR 1910.1003 through 1910.1016) wherein exclusion levels of 0.1 and 1.0 percent were allowed for various carcinogenic chemicals before the regulation applied, and more recently in the case of the OSHA benzene standard (29CFR 1910.1028) wherein there is no warning label requirement for mixtures containing 0.5 percent benzene (0.1 percent after June 27, 1981).

The practice of choosing exclusion levels for regulated materials could be considered as an effort by OSHA and other regulating agencies to now recognize "feasibility" in the development of standards. It would not be feasible to analyze all silicate mineral mixtures for any asbestos content, yet a requirement to label talcs or any other silicate minerals assemblages such as pyrophyllite, kaolin, montmorillonite, etc. containing any asbestos would obligate the producers of many non-beneficiated mineral products to maintain an extremely costly program of trace analysis.

In addition to feasibility, the agencies are also questioning the necessity of stringent regulation in areas such as label requirements. The exception to labeling in the OSHA standard for materials containing asbestos that has been modified with a binder, etc., is evidence of a recognition that only trace amount of asbestos will be released by the normal handling of these products. If only trace amounts of asbestos can be released from a non-modified mixture containing a low percentage of asbestos, then there is similarly no need to label or regulate the mixture.

In a final consideration of the need to stipulate a concentration of asbestos in a mineral product mixture below which no warning label would be required the state of the art of asbestos detection and counting should be recognized. Despite some published reports that concentrations of asbestos below 1 percent can be detected with accuracy, it remains that the accurate identification and quantitative determina-

tion of some of the amphibole varieties of asbestos in an unknown mixture is difficult below 5 percent and almost impossible below 2 percent by weight concentration. This coupled with the present unresolved controversy over the definition of an asbestos fiber favors the setting of a minimum asbestos concentration for purposes of labeling requirements in the ASTM draft standard for asbestos.

I would be pleased to discuss this matter further at our next meeting of E-34 committee.

Sincerely,

R. T. VANDERBILT COMPANY, INC.

Allan M. Harvey

Allan M. Harvey, Manager
Technical Development Department

AMH:lsm

CRMC-MAD-000616

B-2

R. T. VANDERBILT COMPANY, INC.
30 WINFIELD STREET
NORWALK, CONNECTICUT 06855

FEB 4 1976

CABLE ADDRESS
"BILTVA" NORWALK, CONNECTICUT
"WX 710-468-2940
(203) 853-1400

February 2, 1976

Mr. Peter G. Brown
Staff Manager
Standards Development Division
ASTM, 1916 Race St.
Philadelphia, PA. 19103

Dear Mr. Brown:

My comments on the E-34 Naturally Occurring Inorganic ^FFibers Task Force comments submitted in your letter of January 28, 1976 are as follows:

Page 2. Para. 1.2, first line. The last word in this line "that" should read "of".

Page 4. Para. 2.3, 6th line. One "committee" should be deleted.

Page 4. Para 2.3, 9th line. "Mr. S. Holmes" should read "Dr. S. Holmes".

Page 9. Reference 11. The complete reference should be replaced with the following:

"Standard Method No. CTFA J4-1 9-3-75. Cosmetic, Toiletry and Fragrance Association, Talc Subcommittee".

Page 9. Reference #7 was omitted. It should read:

Deer, W.A., R.A. Howie, and J. ^uZassman. Rock Forming Minerals. Vol. 2 & 3, Longman Group Ltd., London, 1963. Pg. 40.

Sincerely,

Allan M. Harvey
Allan M. Harvey
Tech. Devlp. Mgr.

AMH:aa

CRMC-MAD-000617

APPENDIX I

Testing Research Laboratory
University of Sherbrooke
Sherbrooke, P.Q.
Tel.: 819-565-3659

1 March 1973
MC-150-73

Messrs: J. W. Axelson R. E. Byrne E. M. Fenner P. A. Filteau H. Fawcett W. H. Foster G. Gagnon G. W. Gibbs A. N. Harvey M. J. Neville T. D. Oulton L. C. Piuze M. Q. Scowcroft W. H. Smith M. M. Swetonic L. T. Triglea A. A. Winer	-Johns-Manville Research Center -Union Carbide Corporation -Johns-Manville Research Center -Quebec Asbestos Mining Association -National Academy of Sciences -Chairman, QAMA Uniform Classification and Grading Committee -Lake Asbestos of Quebec Limited -McGill University -R. T. Vanderbilt Company, Inc. -Asbestos Cement Products Association -Engelhard Chemical & Mineral Industries -Chairman, QAMA Environmental Control Committee -President, Asbestos Textile Institute -Bell Asbestos Mines Limited -Asbestos Information Association/North America -Engelhard Chemical & Mineral Industries -Department of Energy Mines and Resources of Canada
---	--

Gentlemen:

Further to my letter of 1 February 1973 regarding the proposal for the formation of a subcommittee of ASTM Committee E-34 to deal specifically with 'Naturally-occurring Inorganic Fibers' this proposal has been modified to reflect the comments received. A copy of this revised proposal is enclosed herewith for your disposal.

Yours very truly



M. Cossette

MC-hl
Encl.

CRMC-MAD-000618

1 March 1973
MC-150-73

Mr. P. D. Halley, Chairman
ASTM Committee E-34
c/o: Environmental Health Services
Standard Oil Company (Indiana)
910 South Michigan Avenue
Chicago, Ill. 60605

Dear Mr. Halley:

At the last meeting of Committee E-34, a proposal for the formation of a subcommittee on asbestos was not entertained on the basis of the Committee's policy of avoiding fields of endeavor already regulated by any other agency. At that time, you suggested that I submit for your consideration, and that of your Executive Subcommittee, a written statement of my proposal stating what the scope and goals of such a subcommittee could be. Subsequently, at the meeting of Subcommittee E-34.50, the subject was raised again and discussed at some length, with regard to the formation of a Task Group on Asbestos, it was proposed by Chairman Janous that a complete proposal be submitted to him and to you for consideration.

Accordingly, on behalf of the following interested persons who are either members of E-34 or prospective members, the enclosed proposal is being submitted for your consideration and that of your Executive Subcommittee.

On behalf of:

Messrs: E. M. Fenner	- Johns-Manville Research and Development Center Denver, Colo. 80217 Tel.: 303-770-1000
G. Gagnon	- Lake Asbestos of Quebec Limited Box 608 Black Lake, P.Q., Canada Tel.: 418-423-4221
A. H. Harvey	- R. T. Vanderbilt Company, Inc. 33 Winfield Street East Norwalk, Conn. 06855 Tel.: 203-838-4351
J. L. Barnhart	- National Insulation Manufacturers' Association 7 Kirby Plaza Mt. Kisco, N. Y. 10549

CRMC-MAD-000619

T. D. Oulton	- Engelhard Chemical & Mineral Industries Menlo Park Edison, N.J. 08817
W. H. Smith	- Bell Asbestos Mines Limited Box 99 Thetford Mines, P.Q., Canada Tel.: 418-338-8777
E. T. Triglea	Engelhard Chemical & Mineral Industries Menlo Park Edison, N.J. 08817
R. L. Byrne, Jr.	- Union Carbide Corporation Mining and Metals Division Box 579 Niagara Falls, N.Y. 14302 Tel.: 716-278-3369
J. D. Wendlick	- Weyerhaeuser Co.
A. A. Winer	- Department of Energy, Mines and Resources of Canada Mineral Processing Division 40 Lydia Street Ottawa, Ont. Tel.: 613-996-5449

Also on behalf of and with a mandate from:

- ASTM Subcommittee D30.03
on Asbestos and Naturally Occurring Fibers.
- Quebec Asbestos Mining Association
Suite 320
580 Grande Allée, East
Quebec 4, P.Q., Canada
- Asbestos Textile Institute
Box 471 (131 N. York Road)
Willow Grove, Pa. 19090, U.S.A.

- 3 -

- Asbestos Cement Products Association
20th Floor
521 Fifth Avenue
New York, N.Y. 10017, U.S.A.
- Asbestos Information Association/North America
22 East 40th Street
New York, N.Y. 10016 U.S.A.

Yours very truly
QAMA Testing Research Laboratory



MC-hl

M. Cossette
Director

c.c. -Mr. J. Janous, Chairman
ASTM Subcommittee E-34.50
c/o: American Iron and Steel Institute
1000 K Street, N.W.
Washington D. C. 20036

CRMCMAD-000621

X

R. T. VANDERBILT COMPANY, INC.

33 WINFIELD STREET
EAST NORWALK, CONNECTICUT 06855

CABLE ADDRESS
BILTVAN NEW YORK

December 12, 1973

Mr. Marcel Cossette, Director
Testing Research Laboratory
Quebec Asbestos Mining Association
Universite De Sherbrooke
Sherbrooke, Quebec J1K 2R1

Dear Marcel:

Enclosed is a set of definitions for "fiber" as well as various definitions of the word "asbestos" which contain references to the physical characteristics of naturally-occurring mineral fibers.

I am also enclosing reprints from several newspapers of articles commenting on Dr. Zussman's testimony at the recent Reserve Mining Co. trial in Duluth. If some thought is given to the matter, I believe that whole affair in Duluth could end up with the same question we are faced with in our standard setting - "What is a fiber?" And of course, the people in Duluth also must answer that question in the context of the pathological response of the mineral shapes in question.

Although we have agreed tentatively that the ASTM Designation D 2946-71T definition of a fiber can quite possibly serve our needs, mineralogists and geologists may take issue. A 10:1 ratio mineral particle resulting from the fracture of a shorter particle rather than from the shortening of a long fiber might rightfully be considered not a fiber. It can be argued that a fiber can be shortened until its aspect ratio is 3:1 and it is still a fiber, but a true fiber cannot be formed by the fracturing of a mineral particle that was not a fiber to begin with. In other words, a fiber may have to be defined by its peculiar property to "separate into fibrils" when crushed or processed.

To complicate matters, we have the case of minerals which appear fibrous to the naked eye but fracture easily into non-fibrous particles when processed commercially, and are never experienced in the workplace as anything but a non-fibrous dust. Since we are addressing ourselves to "workplace" standards, should we be concerned with the morphology of minerals as they occur in nature or as they are realistically encountered?

CRMC-MAD-000622

R. T. VANDERBILT COMPANY, INC.

Mr. Marcel Cossette, Director

- 2 -

December 12, 1973

To respond to your question of how many times per year our task-force group should meet, I would say about once a year, although it could be more frequent if the need arose.

I trust the attached information will be of assistance in your proposed letter balloting, and I hope the mails are good enough to allow this letter to reach you in time. Please call me if you need more data.

Very truly yours,

R. T. VANDERBILT COMPANY, INC.

al

Allan M. Harvey, Manager
Legal and Product Application

AMH:slb
Enclosures

cc: Mr. Albert A. Miner

CRMC-MAD-000623



Johns-Manville

Internal Correspondence

To: P Kotin, M.D.

Date: May 26, 1976

From: E. M. Fenner

Copies: G. W. Wright, M.D.
W. B. Reitze

R. P. Carter

Subject: AMERICAN MINING CONGRESS
NONCOAL OCCUPATIONAL HEALTH COMMITTEE

This committee held its first meeting in Washington on Tuesday, May 25.

The first half of the meeting was a discussion of the purpose and scope of the committee. Then considerable time was devoted to comments on the forthcoming meeting of the Federal Metal and Nonmetal Mine Safety Advisory Committee (see copy of our meeting agenda attached).

An item on the Advisory Committee meeting agenda is the MESA suggested revised standard for exposure to asbestos (copy attached). The critical change they proposed is the substitution of the term "mineral fibers" for asbestos, and the elimination of any definition of asbestos. Literal interpretation of the proposed standard could mean that any naturally occurring mineral fiber which meets their definition: "A fiber is defined as a particle that exceeds 5 microns in length but not 5 microns in width and which has a length to width ratio of at least 3 to 1" could be subject to this ruling.

The chairman of the committee, Bernard R. Roy of Amax Inc., appointed an ad hoc subcommittee consisting of:

C. S. Thompson, Ph.D., R. T. Vanderbilt, Chairman
David J. Smith, M.D., U. S. Steel Corporation
Michael J. Doyle, The Hanna Mining Co.
E. M. Fenner

to prepare AMC's comments on the proposed standard and to determine the most effective way of convincing the committee not to endorse the proposal.

For your further information, lists of the Committee members and those attending the May 25 meeting are attached.

May I please have your comments.

E. M. Fenner

CRMC-MAD-000624

cc: G. J. Fiederlein
A. M. Harvey
K. S. Karsten
T. T. Noland
H. B. Vanderbilt

R. T. VANDERBILT COMPANY, INC.
30 WINFIELD STREET
NORWALK, CONNECTICUT 06855

CABLE ADDRESS
"GILTVAN" NORWALK, CONNECTICUT
TWX 710-468-2940
(203) 853-1400

June 22, 1976

VIA AIR MAIL

Mr. Herbert P. Levan
Federal Metal and Nonmetal Mine
Safety Advisory Committee
Room 702
Ballston Tower No. 3
4015 Wilson Blvd.
Arlington, Virginia 22203

Dear Mr. Levan:

This is to advise you that I will be attending the Federal Metal and Nonmetal Safety Advisory Committee meeting to be held in Birmingham, Alabama on June 29-30 and July 1, 1976.

I will be there representing the AMC Noncoal Occupational Health Committee, and accompanied by two other members of the AD HOC Committee on "Mineral Fibers". These gentlemen will be advising you of their intentions to attend individually. We are planning on giving a presentation of no longer than a half an hour.

Very truly yours,

C. S. Thompson/dpk

C. S. THOMPSON, Manager
Minerals, Ceramics & Paper Dept.
Research & Development Division

CST:dpk

cc: Mr. Ernest H. Ronn (Committee Chairman)
United Steelworkers of America
District 33, P. O. Box 83
Negaunee, Michigan 49866

CRMC-MAD-000625

Internal Correspondence

Date: July 31, 1974

[illegible]

Subject. MEETING - 9:00 A.M., AUGUST 6, 1974
DEFINITION OF AN ASBESTOS FIBER - OSHA STANDARD

- (1) A letter to F. J. Solon, Jr., describing ASTM Committee E-34.
- (2) A definition for asbestos fiber as prepared by a subsection of the task group for affirmative or negative balloting by the group members.

R. P. Carter, et al.
Page 2
July 31, 1974

- (3) A series of definitions of asbestos as previously submitted by the following people:
 - A. A. Hodgson, Cape Asbestos Fibres Limited
 - G. Gagnon, Lake Asbestos of Quebec Limited
 - M. Grimard, M.D., Department of National Health & Welfare of Canada
 - R. B. Steele, Asbestos Corporation Limited
 - A. A. Harvey, R. T. Vanderbilt Company
- (4) A definition of an asbestos fiber as prepared by Dr. Steven Holmes of the Asbestosis Research Council.
- (5) The ASTM present definition of asbestos fiber.
- (6) & (6A) Two anonymous definitions of asbestos.
- (7) An anonymous definition of naturally occurring inorganic fibers.
- (8) A copy of the original proposal for the formation of the Task Group on Naturally Inorganic Fibers.
- (9) A listing of active members of the task group and all others on the mailing list for material.

E. M. Fenner

CRMC-MAD-000627



Attachment 1
Johns-Manville

Internal Correspondence

To: F. J. Solon, Jr.

Date: November 30, 1973

From: E. M. Fenner

Copies: File & C

Subject: ASTM COMMITTEE E-34

The reorganization of this Committee took place in Houston, Texas, Wednesday and Thursday, November 28 and 29. It is called the Committee on Occupational Health and Safety Aspects of Materials, Physical and Biological Agents. Its main purpose is to write consensus standards that will be approved by the main body of ASTM and forwarded to the Occupational Safety and Health Administration for reissuance or incorporation in OSHA Occupational Standards.

The Committee is subdivided into working Subcommittees in two categories. The first category, which are called Task Force Groups rather than Subcommittees, are charged with the responsibility for writing the standard on a specific material or process. A list of the Task Force Groups is appended to this report.

At the meeting in Houston, I was elected Vice-Chairman of the Task Group on Naturally Occurring Inorganic Fibers, whose main job will be to write standards for asbestos and talc. A list of the attendees at our Task Force meeting is appended.

In addition to the Task Groups there are Subcommittees comprised of experts in specific areas. The function of the Subcommittees is to assist the Task Groups in writing those portions of the document in which they have expertise and later reviewing the initial and final drafts of these portions of the standards. A list of the Subcommittees is attached. I am a member of Committee 34.40 (Engineering Controls).

The main committee meeting was well attended -- approximately 75 people from the major industrial firms in the United States.

Attachs

CRMC-MAD-000628

Document No. 13
20 June 1974

TENTATIVE DEFINITIONS

asbestiform - matter structured in the form of asbestos¹.

asbestos - generic term for a number of naturally-occurring mineral fibers¹ of hydrated silicate that, when crushed or processed separate into flexible fibers¹ made up of fibrils² (such materials are structured in the form of asbestos and are therefore asbestiform¹). Minerals included under the definition of asbestos are the fibrous varieties of serpentine (chrysotile), riebeckite (crocidolite), cummingtonite (amosite), anthophyllite, tremolite, and actinolite.

fiber - for the purpose of this standard, fiber means naturally-occurring mineral fiber¹.

fibrous particulate - for the purpose of this standard, fibrous particulate designates fibers¹, fiber fragments and fiber agglomerates, with a maximum width of 3 μ m and a minimum length of 5 μ m.

naturally-occurring mineral fiber - form of mineral characterized by properties of flexibility and length-to-width ratio in the order of 100, composed of definite crystal unit cells oriented with respect to a specific axis.

Note 1 - The designated 100:1 aspect ratio is considered to represent a reasonable lower limit for naturally-occurring mineral fibers¹. Fibers¹ of these dimensions can be broken into parts of fibers that may maintain their same surface properties and activities. Therefore fiber fragments may have to be evaluated for atmospheric monitoring purposes. However attempting to define a fiber by its aspect ratio alone is inadequate since it is obvious that particles of non-fibrous material do not become fibers as their aspect ratio increases through comminution.

FOOTNOTES

1. Definitions of asbestiform, asbestos, fiber, and naturally-occurring mineral fiber, are given in this list.
2. Fibril is defined as single crystal in the form of a fiber in ASTM D2946.

CRMC-MAD-000629

SUPPLEMENTAL LISTING OF DEFINITIONS

19 April 1974

This listing is a supplement to Document No. 5 published as Appendix 6 of the minutes of the second meeting of the Task Group on Naturally Occurring Inorganic Fibers of ASTM Committee E-34.

1. Definitions submitted by Mr. A. A. Hodgson, Cape Asbestos Fibres Limited, 24 Jan 1974.

fibres Fibres are defined as being of a length greater than $5\mu\text{m}$ and having a length/breadth ratio of at least 3:1. There is no upper limit for the length of the fibres, but a maximum diameter of $3\mu\text{m}$ is defined. Airborne asbestos dust concentrations are expressed in fibers per milliliter of air (f/ml).

(taken from the Asbestosis Research Council's Technical Note 1, paragraph 2.1)

asbestos - acicular silicate mineral, with a structure based on silicon - oxygen tetrahedra, composed of crystals in a predominantly parallel orientation, and distinguished by its ability to split indefinitely from its macro form to individual flexible fibrils having minimum length to breadth ratio of 3 to 1 and cross sectional dimensions approaching $0.01\mu\text{m}$.

2. Definitions submitted by Mr. G. Gagnon, Lake Asbestos of Quebec Limited, 28 Jan 1974:

fibre - any material in a form such that it has a minimum ratio of length to average maximum transverse dimensions of 10 to 1.

asbestos fibre - silicate mineral, with a structure based upon silicon - oxygen tetrahedra, that fits the definition of a fibre and is composed of single crystals in predominantly parallel orientation. Common usage also designates a collectivity of asbestos fibres as asbestos fibres.

3. Definitions submitted by Dr. M. Grimard, Chief, Health Effects Division, Environmental Health Directorate, Department of National Health and Welfare of Canada,

fibre - (definition as applied to minerals): any material which by microscopy presents the following optical characteristics: a filiform or bundle of filiform bodies having a length to diameter ratio of at least 3:1

asbestos - acicular silicate mineral, with a structure based upon silicon-oxygen tetrahedra, that fits the definition of a fiber, and is composed of single crystals in predominantly parallel orientation.

4. Definitions submitted by Mr. A. M. Harvey, Manager, Legal and Products Application, R. T. Vanderbilt Company, Inc., 4 Jan 1974:

mineral fiber - any form of mineral characterized by properties of flexibility and length to width ratio of at least 100, and composed of definite crystal unit cells oriented with respect to a specific axis.

asbestos - is a generic term for a number of hydrated silicate minerals that, when crushed or processed, separate into flexible fibers made up of fibrils. These minerals include chrysotile, crocidolite, amosite, anthophyllite asbestos, tremolite asbestos and actinolite asbestos.

5. Definitions submitted by Mr. R. B. Steele, Laboratory Services Engineer, Product Research and Development Department, Asbestos Corporation Limited, 5 March 1974:

Fibril - Is a polymeric form of solid whose component repeating sub-units extend along a single major axis, and which can not be subdivided along this longitudinal axis without destroying the integrity of the structure.

Fiber - Is a bundle of fibrils in parallel alignment, the composite possessing a maximum diameter of 100 microns, and a minimum aspect ratio of 20.

Asbestos - Is a generic term for a number of silicate minerals, the morphology of whose component particles fits the definition of a fiber.

Asbestos Fiber - Is a fiber belonging to one of the six types of asbestos minerals: chrysotile, crocidolite, amosite, anthophyllite asbestos, tremolite asbestos, and actinolite asbestos.

6. Definitions submitted by Mr. A. A. Harvey, Manager, Legal and Products Application, R. T. Vanderbilt Company, Inc., 30 Jan 1974; Definitions taken from pages 26, 27 174 and 175 of the 1973 ASTM Glossary: Refer to page 3.

7. Refer to Appendix 5 and 6 of the minutes of the third meeting of the Task Group on Naturally Occuring Inorganic Fibers.

STEVE HOLMES

A.
APPENDIX 7
Document No. 9

Attachment 4

THE DEFINITION OF AN ASBESTOS FIBRE

When the United Kingdom Asbestosis Research Council was founded in 1957, its main objective was to carry out research into the causation of the pulmonary fibrosis of the lung known as asbestosis. The existence of protein coated asbestos fibres, known as asbestos bodies, in the lungs of asbestos workers had been known for some considerable time, and it was noticed that such bodies "aged" in the lung, so that the protein envelope disintegrated, releasing the fibre core, which itself often broke up in the process. This breakdown of the asbestos body was considered at the time to play some part in the development of disease.

In sampling airborne asbestos, it had been customary up to this time to count all particles, mother rock and fibres, visible in an optical microscope at 800 to 1000 x magnification. The medical experts had noted, however, that asbestos bodies were only formed on true fibres generally in the length range 10 to 50 microns, and the scientists were asked to provide a sampling and measuring system which would include all fibres within this range. To give adequate cover at both ends of the scale, it was decided to provide counts of all fibres whose length was

CRMC-MAD-000632

between 5 and 100 microns, and it was eventually found that this could best be achieved by collecting on a membrane filter and counting on a phase contrast optical microscope at about 500 x magnification. The development of the method was reported by me at the New York Conference on the Biological Effects of Asbestos in 1964 and published in the Annals of the New York Academy of Sciences in December, 1965.

At the time, we were largely concerned with chrysotile asbestos, and it was necessary to give guidance to those engaged in counting to distinguish between particles of serpentine rock and what could be regarded as fibrous structures. It was found that a suitable convention to adopt was to regard as a fibre only those particles with a length/diameter ratio (aspect ratio) of at least 3 to 1, but it should be emphasised that this choice was purely arbitrary. The definition of a fibre for counting purposes, therefore, became—"a particle of length/diameter ratio of at least 3 to 1 and at least 5 microns in length." Later an upper limit of 3 microns was placed on the diameter, because fibres of larger diameter than this were outside the respirable range.

A delegation from the U. S. Public Health Service under Dr. . G. Cralley visited the Asbestosis Research

CRMC-MAD-000633

Council in 1963 and were given details of the method, which they subsequently adopted, with minor modifications. In 1970, a meeting of the Asbestosis Subcommittee of the Permanent Commission and International Association on Occupational Health recommended the membrane filter method, fibre definition and all, as the standard method for measuring occupational exposure to airborne asbestos.

Modern thinking now believes that asbestos bodies play no part in the asbestos lung diseases, but it is the uncoated fibres which are also present and remain in the lung which are responsible. It is comforting to know, however, that the fibre definition was well chosen, because it has been recently shown that the lung clearance mechanisms can deal with fibres shorter than 5 microns long and definitely cannot deal with those larger than 15 - 25 microns.

It must be emphasised that all of the foregoing was concerned with inhalation of asbestos dust and the control of asbestosis and its associated lung cancers. The measuring system was developed before mesothelioma was recognized as an asbestos induced disease. Its relevance to the question of ingestion of asbestos is extremely doubtful, except that the body clearance mechanisms appear to be able to deal with short fibres and particles, but have difficulty with the longer fibres. It seems to me to

be a pre-requisite to carcinogenesis that the causative agent should remain in the body for a period of time.

S. Holmes, B.Sc., Ph.D., F. Inst. P.
Secretary, Asbestosis Research Council



Designation: D 2946 - 71 T

coarse-hair content as
2816.

of dispute, make a single
ation of the cashmere
cashmere as directed in

te, make two additional
nles and base the deci-
sult.

ent rights in connection there-
anyone utilizing the standard

Tentative Definitions of TERMS RELATING TO ASBESTOS FIBER¹

These Tentative Definitions have been approved by the sponsoring committee and accepted by the Society in accordance with established procedures, for use pending adoption as Standard. Suggestions for revisions should be addressed to the Society at 1916 Race St., Philadelphia, Pa. 19103.

asbestos fiber—acicular silicate mineral, with a structure based upon silicon-oxygen tetrahedra, that fits the definition of a fiber,² and is composed of single crystals in predominantly parallel orientation. Common usage also designates a collectivity of asbestos fibers as asbestos fiber.

bundle—an heavy assemblage of asbestos fibers² in close-packed parallel orientation, which may be partially crushed, and which has a transverse dimension exceeding 8 mm (0.3 in.).

cross-fiber—asbestos fiber² that originates from veins or seams in which fibers² are oriented predominantly at right angles to the plane of the vein or seam.

crude asbestos—hand-cobbed released from its ore by manual hammer impact cross-vein asbestos in its natural or unfiberized form.

crudiness (kröödiness)—the degree to which an asbestos fiber² approaches the crude state.

crudy (kröödi)—the quality of processed asbestos fiber² with relatively low specific surface area and degree of fiberization, containing an appreciable portion of unfiberized agglomerates (derived from the term crude asbestos).

crudy bundle (kröödi)—an heavy assemblage of asbestos fibers² in close-packed parallel orientation, which may be partially crushed, and which has a transverse dimension exceeding 8 mm (0.3 in.).

fiber—any material in a form such that it has a minimum length to average maximum transverse dimension of 10 to 1, a maximum cross-sectional area of 7.85×10^{-3} in.² (5.06×10^{-2} mm²) (corresponding to a circular cross section of 0.010 in. (0.254 mm) in diameter) and a maximum trans-

verse dimension of 0.010 in. (0.254 mm).

fiber spicules—rod-like pieces composed of asbestos fibers² in close-packed parallel orientation, with undisturbed natural relative positions, of sufficient number to impart rigidity. If dimensions exceed 10 mm (0.4 in.) in length and 1 mm (0.04 in.) in transverse dimension, the term pencil may be used.

fibril—a single crystal in the form of a fiber.²

finest—the finest class of material produced by particle size classification of asbestos fiber² by any accepted test method. Common usage in the asbestos industry has defined finest as that which passed through the finest mesh used in ASTM Method D 2589, Test for Bauer McNett Wet Classification of Asbestos Fiber.^{2, 3}

loftiness—the measure of an asbestos fiber's² loose specific volume. This is inversely related to the dry bulk density.

milled asbestos—all grades of asbestos produced by the mechanical treatment of asbestos ore.

milling—a process by which asbestos ore is treated mechanically to produce grades of asbestos fiber² with desired properties.

nonfibrous spicules—acicular particles resembling assemblages of asbestos fibers² composed of nonfibrous, or semifibrous minerals such as picrolite.

¹ These definitions are under the jurisdiction of ASTM Committee D-40 on High-Strength Fibers and Their Composites. This tentative is the direct responsibility of Subcommittee D-30.03 on Asbestos and Naturally Occurring Fibers.

Effective Jan. 8, 1971.

² Definitions for the terms fiber and asbestos fiber are included in this list.

³ Annual Book of ASTM Standards, Part 25.

Definition of Asbestos

Asbestos: "Asbestos" is a generic term for a number of hydrated silicate minerals that, when crushed or processed separate into flexible fibers made up of fibrils. Minerals included in the definition of asbestos are chrysotile, crocidolite, amosite, anthophyllite asbestos, tremolite asbestos and actinolite asbestos.

A mineral fiber is any form of mineral characterized by properties of flexibility and length to width ratio of at least 100, and composed of definite crystal unit cells oriented with respect to a specific axis.

Note: The designated 100:1 aspect ratio is considered to represent a reasonable lower limit for naturally occurring mineral fibers. This is not to say that fibers of these dimensions cannot be broken down into parts of fibers which could maintain their same surface properties and activities, and therefore conceivably be as biologically active as the parent material. However, attempting to define a fiber by its aspect ratio alone is inadequate, since it is obvious that particles of non-fibrous material do not become fibers as their aspect ratio increases through processing.

DEFINITIONS

Task Group on Naturally Occuring Inorganic Fibers

ASTM Committee E-34

fiber - any material in a form such that it has a minimum ratio of length to average maximum transverse dimension of 10 to 1, a maximum cross-sectional area of $5.06 \times 10^{-2} \text{ mm}^2$ ($7.85 \times 10^{-5} \text{ in.}^2$) {corresponding to a circular cross section of 0.254 mm (0.010 in.) in diameter} and a maximum transverse dimension of 0.254 mm (0.010 in.)

asbestos fiber - acicular silicate mineral, with a structure based upon silicon-oxygen tetraheda, that fits the definition of a fibre, and is composed of single crystals in predominantly parallel orientation. Common usage also designates a collectivity of asbestos fibers as asbestos fibre.

CRMC-MAD-000638

Naturally Occurring Inorganic Fibers

Definition: A naturally occurring inorganic mineral fiber is any form of mineral characterized by properties of flexibility and length to width ratio of at least 100, and composed of definite crystal unit cells oriented with respect to a specific axis.

Note: The designated 100:1 aspect ratio is considered to represent a reasonable lower limit for naturally occurring mineral fibers. This is not to say that fibers of these dimensions cannot be broken down into parts of fibers which could maintain their same surface properties and activities, and therefore conceivably be as biologically active as the parent material. However, attempting to define a fiber by its aspect ratio alone is inadequate, since it is obvious that particles of non-fibrous material do not become fibers as their aspect ratio increases through processing.

ATTENDANCE

Third meeting of the Task Group on Naturally Occuring Inorganic Fibers,
Philadelphia, Pa. 18 and 19 April 1974

W. H. Ashton	- Johnson & Johnson Co.
M. Cossette	- Recording Secretary -
	Quebec Asbestos Mining Association
E. M. Fenner	- Vice- Chairman, Johns-Manville
G. J. Foy	- Department of Natural Resources of Quebec
A. M. Harvey	- R. T. Vanderbilt Co.
S. Holmes	Secretary of the Asbestosis Research Council
	T.B.A. Industrial Products Limited
H. H. Kaufman	- GAF Corporation
A. M. Kooiman	- Representative of the Editorial Subcommittee
	- Motor Vehicle Manufacturers' Association
J. F. Martonik	- MESA, Department of the Interior Washington
	D.C.
R. McCarthy	- International Talc
P. W. McDaniel	- Union Carbide Corporation
R. H. Mereness	- Asbestos Information Association/North
	America
• P. V. Pelmar, M.D.	- Institute of Occupational and Environmental
	Health
C. S. Thompson	- R. T. Vanderbilt Company.
A. A. Winer	- Chairman, Department of Energy, Mines and
	Resources of Canada

MAILING LIST

Dr. J. W. Axelson	- Johns-Manville Research and Development
	Center
Dr. E. Berry	- Department of Materials Chemistry
R. A. Bramley-Moore	- Chrysotile Corporation of Australia
	Pty. Ltd.
W. R. Cooling	- Asbestos Corporation Limited*
H. A. Eschenbach	- Industrial Hygienist
	W. R. Grace & Co.
P. A. Filteau	- Quebec Asbestos Mining Association
G. Gagnon	- Assistant Mill Superintendent
	Lake Asbestos of Quebec Limited
G. W. Gibbs	- McGill University
	Department of Epidemiology and Health
Dr. M. Grimar	- Department of National Health and Welfare
	of Canada

MAILING LIST (suite)

A. Goodwin	- Head, Health Division
A. A. Hodgson	- Cape Asbestos Fibers Limited
Dr. R. A. Kuntze	- Ontario Research Foundation
Dr. J. Lepoutre, M.D.	- Eternit S. A.
B. Lincoln	- Turner Newall Fibre Laboratory
C. G. Morgan	- North American Asbestos Corporation
K. Morgareidge	- Food and Drug Research Laboratories, Inc.
T. D. Oulton	- Research Associate, Minerals & Chemicals Division
L. C. Piuze	- Lake Asbestos of Quebec Limited
M. Q. Scowcroft	- Asbestos Textile Institute
W. H. Smith	- Bell Asbestos Mines Limited
R. B. Steele	- Asbestos Corporation Limited
C. E. Stiefken	- American and Refining Co. Ltd.
E. T. Triglea	- Engelhard Chemical & Mineral Industries

FILE - ASTM

PROPOSAL FOR THE FORMATION OF A
SUBCOMMITTEE ON NATURALLY-OCCURRING INORGANIC FIBERS

PURPOSES:

To study the OSHA document on asbestos (PB 209510) Criteria for a Recommended Standard/Occupational Exposure to Asbestos. The regulations contained therein are based upon data the value of which is being increasingly questioned and criticised, and upon a method of test that gives unacceptable interlaboratory reproducibility.

To gather new data, and to re-asses the presently available data critically, for the purpose of recommending more valid threshold limit values. To define each type of asbestos, or other naturally occurring fibers exactly, and to asses the data relating to each type with a view to proposing valid regulations for each type.

To apply statistical techniques to determine appropriate sampling strategy, to determine probable sampling error, to measure single operator reproducibility and inter-laboratory precision.

To define more precisely the type of optical microscope used for making fibre counts, and the conditions under which such counts are determined to ensure reliable results.

To develop quantitative analytical methods for the analysis of specimens collected on filter membranes to replace unreliable fiber counts.

SCOPE

Responsible for the gathering and assesment of scientific data, development of statistical sampling methods, evaluation of the presision of existing methods, development of valid test methods, specifications, recommended practices, nomenclature, classification, stimulation of research and investigation of naturally occurring inorganic fibers, in direct collaboration with each of the other competent Subcommittees.

CRMC-MAD-000642

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
WASHINGTON, D.C. 20210



Office of the Assistant Secretary

August 6, 1974

Mr. H. B. Vanderbilt
President
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 06855

Dear Mr. Vanderbilt:

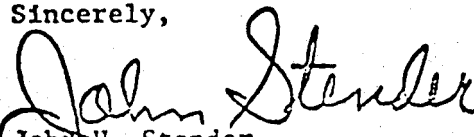
Your request for an interpretation of the asbestos standard, section 1910.93a, as it related to tremolite talc has been given deep consideration.

The following interpretation of the standard, 1910.93a, is collectively the opinions of both the Occupational Safety and Health Administration and the National Institute for Occupational Safety and Health.

The present asbestos standard is written for the purpose of controlling exposures to the fibrous or asbestiform minerals commonly considered to be asbestos. This is reflected in the established permissible limit for asbestos air contamination to which a worker may be exposed. This is expressed in terms of numbers of fibers in excess of a prescribed length per unit of volume. The required method of determination or analysis is also expressed as a method for counting fibers.

Therefore, nonfibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the existing standard. Talc containing only non-asbestiform tremolite is not regulated by the standard 1910.93a. For emphasis, if only talc and non-fibrous tremolite are present, there is no violation of the asbestos standard. Talc containing asbestiform tremolite or other fibrous asbestos minerals will be regulated by the standard 1910.93a.

Sincerely,


John H. Stender
Assistant Secretary of Labor

CRMC-MAD-000643

E. M. Fenner - 4N

January 15, 1974

S. Speil - R&D

TASK GROUP ON NATURALLY OCCURRING INORGANIC FIBERS
ASTM COMMITTEE E-34

Your note of January 11, 1974

You are correct that this is the present ASTM definition. Attached is a copy of the page in the ASTM book giving these definitions. As a matter of fact, the fiber definition is the one that I suggested that Vanderbilt try to get accepted in their proposal to the FDA/Bureau of Mines.

As a matter of information, the definition of asbestos fiber is a good commercial definition, but could lead to serious problems of interpretation. For example, if a microscopist looks at a talc sample and attempts to "count" tremolite fibers what he is counting normally is individual crystals. The tremolite "fibers" are not "composed of single crystals in predominantly parallel orientation"; therefore, these tremolite particles would not be classed as asbestos fiber under the proposed definition.

Under the proposed definition I doubt whether we could even classify many of the crocidolite particles in the UICC sample as asbestos fiber. Finally, if we were to look at a well-dispersed field of chrysotile fibrils, obviously each fibril would not be an asbestos fiber because it is one single crystal but not an assemblage of crystals in predominantly parallel orientation.

While the intent of this definition is excellent in that under it much of the matter, for example in Duluth water, might not be classed as asbestos fiber because it comes from the cleavage of a rock during grinding, the microscopist examining the sample would be put to a difficult task under some circumstances to determine whether the individual crystals that he sees in the microscope field were produced by breaking up a basically massive material or whether they came from separating crystals which originally existed as an assemblage of "single crystals in predominantly parallel orientation".

I hope I haven't confused you by the facts. I am in favor of such a definition, but I foresee difficulties in its interpretation for microscopic studies.

CRMC-MAD-000644



Johns-Manville

Internal Correspondence

To: F. J. Solon, Jr.

Date: November 30, 1973

From: E. M. Fenner

Copies: File & C

Subject: ASTM COMMITTEE E-34

The reorganization of this Committee took place in Houston, Texas, Wednesday and Thursday, November 28 and 29. It is called the Committee on Occupational Health and Safety Aspects of Materials, Physical and Biological Agents. Its main purpose is to write consensus standards that will be approved by the main body of ASTM and forwarded to the Occupational Safety and Health Administration for reissuance or incorporation in OSHA Occupational Standards.

The Committee is subdivided into working Subcommittees in two categories. The first category, which are called Task Force Groups rather than Subcommittees, are charged with the responsibility for writing the standard on a specific material or process. A list of the Task Force Groups is appended to this report.

At the meeting in Houston, I was elected Vice-Chairman of the Task Group on Naturally Occurring Inorganic Fibers, whose main job will be to write standards for asbestos and talc. A list of the attendees at our Task Force meeting is appended.

In addition to the Task Groups there are Subcommittees comprised of experts in specific areas. The function of the Subcommittees is to assist the Task Groups in writing those portions of the document in which they have expertise and later reviewing the initial and final drafts of these portions of the standards. A list of the Subcommittees is attached. I am a member of Committee 34.40 (Engineering Controls).

The main committee meeting was well attended -- approximately 75 people from the major industrial firms in the United States.

Attachs.

CRMC-MAD-000645

Wednesday - November 28, 1973 (Continued)

1:30 - 5:00 PM

Task Force Meetings

(The following T.F.'s will meet concurrently)

Methyl Ethyl Ketone - Sol Levine

Styrene Monomer - Bernard Grabias

Stoddard Solvent - Homer Cole

Carbon Disulfide - Grover Wrenn

Hydrogen Sulfide - John W. Miller

Naturally Occuring Inorganic Fibers - A. A. Winer

Acetone

Carbon Bisulfide

Acrylonitrile

Methyl Cellosolve

Phthalic Anhydride

Ozone

Nickel Carbonyl

Zinc Chromate

3:00 - 5:30 PM

Chairmen of Subcommittees available for questions and discussion.

Thursday - November 29, 1973

8:00 AM

Registration

9:00 - 12:00 AM

Subcommittee Meetings

E34.10 - Definitions and Nomenclature - Henry M. Kissman

E34.20 - Medical - Ernest Dixon

E34.30 - Control - C. W. Schultz

E34.40 - Toxicology - James McNerney

E34.60 - Safety - Darwin E. Rhoads

Thursday - November 29, 1973 (Continued)

E34.70 - Data Collection - A. M. Kooiman

E34.91 - Liaison

E34.92 - Editorial - Fred M. Oberlander

12:00 - 1:30 PM LUNCHEON

1:30 - 4:00 PM E-34 Main Committee

1. Reports

1.1 Executive Subcommittee

1.2 Task Force

1.3 Subcommittees

2. Discussion

3. New Business

4. Next Meeting

5. Adjournment

TASK GROUP ON NATURALLY OCCURRING INORGANIC FIBERS

Dr. A. A. Winer, Chairman
Department of Energy, Mines & Resources of Canada
Mining Processing Division
Ottawa, Ontario, Canada

E. M. Fenner, Vice-Chairman
Johns-Manville Corp.
Denver, CO 80217

Marcel Cossette, Recording Secretary
QAMA Testing Research Laboratories
University of Sherbrooke
Sherbrooke, PQ, Canada

G. J. Foy
Department of National Resources of Quebec
Quebec, PQ, Canada

G. Gagnon
Lake Asbestos of Quebec Limited
Black Lake, PQ, Canada

A. M. Harvey
R. T. Vanderbilt Co.
East Norfolk, Conn.

H. A. Hoffman
Assistant Director of Quality Control
Building Materials Divisions
GAF Corporation
South Bound Brook, N.J.

Kenneth Morgareidge
Food and Drug Research Laboratories, Inc.
Waverly, N.Y.

T. D. Oulton
Englehard Chemical and Mineral Industries
Edison, N.J.

CRMC-MAD-000648

John-Manville

Internal C. T. Vanderbilt

To: J. E. Conner - 2-04

Date: October 1, 1976

From: J. W. Axelson - R&D

Copies: D. Poutiatine - 2-04
J. F. Reis - 2-04

W. C. Streib - R&D
W. J. Plichta - R&D ✓

Subject: AMERICAN MINING CONGRESS
PAPER ENTITLED "ASBESTOS IN YOUR FUTURE"

This paper was presented by C. S. "Slim" Thompson, Manager, Ceramics, Paper and Specialties R&D, R. T. Vanderbilt, Inc., Norwalk, Connecticut, at a Safety and Health Session.

He started his presentation with a statement that regulatory agencies are creating asbestos where it never was before. This includes products, mine wastes and other areas that are not related to the asbestos industry.

A table was shown which had been made up by Mr. Thompson and shows the normal six varieties of asbestos as asbestiform materials and a number of other non-asbestiform materials some of which had the same name but were not asbestos by his definition. These included antigorite, lizardite, riebeckite, cumingtonite, gunerite and anthophyllite, tremolite and actinolite.

The history of the various promulgations and regulations by EPA, OSHA, and MESA was given in chronological sequence. The aspect ratio was set at 3/1 and EPA regulations covered anything containing asbestos.

With prodding from the talc industry, the Bureau of Mines had a symposium on talc with about 50 people attending. From this the Bureau of Mines only included asbestiform materials in their thinking. OSHA issued a memorandum listing five criteria for fiber identification including that it has to be of a fibrous nature and with the ultimate size being a fibril rather than cleavage particles. EPA set a 1 percent level on the maximum allowable quantity of asbestos in a material before it has to be handled like asbestos, and MESA followed OSHA's lead.

However, on October 9, 1975, OSHA went back to its original definitions and negated the memorandum. EPA has included Wollastonite in its effluent discharge requirements. And,

CRMC-MAD-000649



Johns-Manville

Internal Correspondence

To: R. P. Carter - 4N

Date: July 18, 1975

From: J. P. Leineweber - R&D

Copies: See Reverse Side

Subject: R. T. VANDERBILT PRESENTATION TO OSHA

As I mentioned in our telephone conversation, there are several points in the R. T. Vanderbilt presentation which require clarification, particularly to NIOSH and OSHA officials. First, and foremost, is the implication that our reporting of chrysotile in the Vanderbilt products was in error. This was reported only after very careful analysis and confirmation by several techniques. There is no doubt in my mind that the results are accurate and valid for the particular sample we examined. It must be recognized that the amount of any mineral in such a product can vary considerably from lot to lot, but it is a well known fact that chrysotile does occur in the Grovener deposit.

It is also somewhat surprising that the chrysotile was not detected by McCrone Associates. It would be worthwhile for us to have McCrone analyse the sample in which we found a high concentration of chrysotile. Any samples sent for this purpose should be "blind", with the request for the type and amount of any asbestiform minerals present.

The comment that J-M "...would use the outdated and inadequate definition of a fiber..." is totally unjustified. For problems of this type we use the definitions in the OSHA regulations and the supporting NIOSH criteria documents. There is no other definition to be considered for analyses to determine compliance with the OSHA regulations. In this same context the regulations limit the number of asbestiform fibers per cc in the working environment. The comment on Page 5, regarding the state of the art of analysis of asbestos fiber in talc is completely irrelevant.

Finally, they use the results obtained by Dr. W. E. Smith to indicate that tremolitic talc is not biologically active. At a meeting of the IOEH in Montreal last year, it was determined that this particular sample did not contain sufficient fibrous tremolite to yield conclusive results.

J. P. Leineweber
J. P. Leineweber



Johns-Manville

Internal Correspondence

To: P. Kotin

NRA
Date: January 2, 1975

From: H. R. Keefe

Talc - Ken

Copies: Listed Below

Subject: Talc and Asbestos

Attached is a letter we recently received from the National Paint and Coating Association. This letter has been sent to all members of this Association.

Please note Page 3 under Recommendations. We feel quite confident that R. T. Vanderbilt Company will certify that their talc does not contain asbestos per this paragraph.

A speedy resolution of the confusion caused by OSHA and their definition of a fiber is necessary so that we might have answers concerning our talc for our customers.

Harry R. Keefe

HRK:ccr

Attachment

cc: P. A. Martinson
H. Kranich
A. C. F. Finkbiner
F. J. Solon
R. S. Lamar
E. M. Fenner ✓
D/C

HRK

CRMC-MAD-000651



No. 20
December 5, 1974

TALC AND THE OSHA ASBESTOS STANDARD 1910.93a

ROUTE TO: Department

Finance		
Administration		
Sales		
Technical		
Production		

Executive Synopsis

The OSHA Asbestos Regulation 1910.93a includes, in its definition of asbestos, a mineral form (tremolite) that is found in some talcs, but is not generally considered an asbestiform material (see Safety and Health Bulletin No. 15, "Asbestos Handling Guidelines" dated October 30, 1973). Through the extensive efforts of several NPCA members, a clarification of the regulation was obtained from OSHA. This now allows talc manufacturers to certify their material is "asbestos free" and the user of that talc is then exempt from regulation under 1910.93a.

ACTION REQUIRED BY YOU - Forward this Bulletin to the person or persons responsible for your safety and health operations.

ACTION TAKEN BY NPCA - Through the efforts of NPCA members and the Occupational Health Task Force a clarification of the standard was accomplished.

OPERATIONS AFFECTED IN YOUR COMPANY - Manufacturing, safety and health.

STAFF CONTACT AT NPCA - Richard W. Murry, Assistant Technical Director

BACKGROUND

With the promulgation of the asbestos Standard 1910.93a in July 1972 the possibility of certain talc materials being regulated as asbestos was created. According to the regulation, asbestos is defined as the following mineral forms: chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite. While some talcs are indeed marketed as containing asbestiform minerals and noted for their fibrous properties, the standard also encompassed other talcs not previously considered to be fibrous or considered to contain asbestiform materials. These are the tremolite (or more correctly non-asbestiform tremolite) containing talcs.

Since late 1972 the R. T. Vanderbilt Company Inc. and the International Talc Company (later purchased by Vanderbilt) have had numerous meetings with OSHA officials to obtain a clarification on the regulation of the talcs under 1910.93a.

RECENT DEVELOPMENTS

On October 9, 1974 in a letter to Mr. H. B. Vanderbilt, President of R. T. Vanderbilt Company, Inc., Mr. John Stender, Assistant Secretary of Labor, stated in part:

"...if you (the talc manufacturer) have scientific evidence that the naturally occurring talcs, prior to processing by milling or crushing, do not contain fibrous or asbestiform tremolite, anthophyllite, actinolite or other asbestiform minerals, you may certify to your customers that the talc does not contain asbestos." (A copy of the letter is attached to this bulletin.)

Also a directive to such effect has been issued to OSHA field personnel as a guide in making inspections. This directive indicates that if a talc user, i.e., a paint and coatings manufacturer, is monitored for asbestos the person behind the microscope counting fibers should use the following identification criteria:

- A. Particles must appear to be fibrous rather than as crystals or slivers.
- B. The maximum diameter of a fiber to be counted is 3 microns.
- C. The maximum length of a fiber to be counted is 30 microns.
- D. The length to width ratio must be 5 or more to 1, that is, 5 times or more longer than wide.
- E. The separate or individual fibers must contain fibrils or the "bundle of sticks" effect, unless they are at a nondivisible stage. A fibril cannot be subdivided and would be counted if it meets the other criteria. The electron microscope may be used to prove the fibrous nature of the particles. The length to width ratio of 5 or more to 1 is not meant to imply that other particles are not hazardous.

Page 3

The directive further states that if the talc is of the non-asbestiform or non-fibrous variety the time weighted average (TWA) of 20 millions of particles per cubic foot of air (mppcf) will be used.

If monitoring of your operations using talc is done by the OSHA inspector you should retain a sample of the talc material being used in the event a discrepancy may arise.

RECOMMENDATION

If you have been using talc products that have been questionable regarding asbestos content, request certification from the manufacturer that they do not contain asbestos. |||

Retain this certification to show to an OSHA inspector if he questions the asbestos content of the talc. If it is however determined that a talc does contain true asbestiform minerals, that material will not be certified and is subject to the provisions of the regulation.

CRMC-MAD-000654

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
WASHINGTON, D.C. 20210



Office of the Assistant Secretary

OCT 9 1974

Mr. H. B. Vanderbilt
President
Chief Executive Officer
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 08855

Dear Mr. Vanderbilt:

This is in reply to your letter of September 26, concerning your request for relief from the asbestos standard for your talcs containing non-fibrous tremolite, actinolite, and anthophyllite.

My letter of August 6 stated that non-fibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the asbestos standard and, therefore, the provisions of that standard do not apply to talc containing non-asbestiform minerals.

NIOSH is currently conducting a thorough investigation into the exact minerals to which talc workers were exposed in those studies where asbestosis or other adverse medical effects were found.

Pending the receipt and evaluation by OSHA of the report by NIOSH on this investigation, if you have scientific evidence that the naturally occurring talcs, prior to processing by milling or crushing, do not contain fibrous or asbestiform tremolite, anthophyllite, actinolite or other asbestiform minerals, you may certify to your customers that the talc does not contain asbestos.

Fibrous, asbestiform minerals such as fibrous tremolite means naturally occurring asbestiform minerals which prior to or after crushing and processing, contain fibers made up of fibrils.

Sincerely,

A handwritten signature in dark ink, appearing to read "John H. S. [unclear]", is written over the typed name.

John H. S. [unclear]
Assistant Secretary of Labor

CRMC-MAD-000655

→ *mm Fenner*

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
WASHINGTON, D.C. 20210



Office of the Assistant Secretary

13 JAN 1975

Paul Kotin, M.D.
Vice President
Health, Safety and Environment
Johns-Manville Corporation
Greenwood Plaza
Denver, Colorado 80217

Dear Dr. Kotin:

This is in reply to your letters of December 17 and 19, 1974 regarding our Field Information Memorandum 74-92 of November 21, 1974.

You asked for further clarification and guidance and requested to meet with us to discuss the matter.

Our purpose in preparing the Field Information Memorandum was to provide guidance in distinguishing between fibrous and non-fibrous talc or tremolite.

Here are our comments to your observations:

- 2C Fiber length - We agree that fibers up to 200 micrometers in length should be counted, providing the diameter is not more than 3 micrometers.
- 2D The standard does not address length to width ratio. Five or more to one, length to width ratio is an arbitrary matter of convenience in counting to distinguish slivers or crystals from fibers. The three to one ratio provides some additional difficulty in distinguishing fibrous from non-fibrous. Again, length to width ratio and diameter are not in the present standard. Minimum length is stated in the standard as 5 micrometers. We see no need to change the standard because of Field Information Memorandum 74-92 of November 21, 1974.

CRMC-MAD-000656

- 2 -

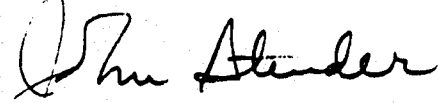
- 2E The "bundle of sticks" effect is mentioned in the literature as a distinguishing characteristic of fibrous minerals, as compared with very fine fibrous glass, for example. It can be seen under phase contrast microscopes with 400 X magnification, according to our laboratory in Salt Lake City.

Only in cases where further proof is needed would electron microscopy be used. This advice was given to the Occupational Safety and Health Administration (OSHA) field offices and laboratory. Field Information Memoranda are available to the public, but are primarily for guidance to OSHA staff. You are under no requirement to use electron microscopy, nor are your customers. OSHA reserves the right to use it to prove that a mineral is fibrous or non-fibrous.

The asbestos standard is being studied for possible revision. Your comments will be considered in revising the standard at a later date.

Please arrange to meet with Dr. Daniel Boyd, Mr. John P. O'Neill, Mr. Harry Gilbert, Mr. Ray McClure, Mr. Richard Wilson, and Mr. Howard Schulte, Deputy Assistant Secretary of Labor, on this matter. You may contact Mr. Schulte, area code 202-961-2144, for the time and place.

Sincerely,



John H. Stender
Assistant Secretary of Labor

CRMC-MAD-000657

Talc - Gen.

H. R. Keefe

January 16, 1975

H. Kranich

See end of letter

R. T. VANDERBILT

Attached is copy of their January 2, 1975 letters addressed to a customer and copy they attach of Stender October 9, 1974 letter. These copies were secured by our Houston Area Manager, Frank Buck, from a Vanderbilt customer. The distribution of this letter is confirmed as I had the same letter read to me over the phone from another source.

You will observe the 1st paragraph "hanging" phrase "we hereby certify the following grades of talc". They certify nothing except by inference to Stender letter.

By this inference, they certify from Stender 4th paragraph "does not contain asbestos". Vanderbilt letter makes no mention of having "scientific evidence".

This latest action makes it imperative we have a "position" response agreed upon to explain our Desertalc label. Not a rebuttal to Vanderbilt, but a factual statement to effect our talc contains tremolite. Tremolite is asbestos according to 1910.93a and until true clarification made, we will conform to the "law of the land", etc.

H. Kranich

attachment

cc:

F. M. Fenner
A.C.F. Finkbinder
Paul Kotin-4N
R. S. Lamar
R. P. Carter-4N
W. C. Streib
D/C

CRMC-MAD-000658

R. T. VANDERBILT COMPANY, INC.
30 WINFIELD STREET
NORWALK, CONNECTICUT 06855

CABLE ADDRESS
R. T. VANDERBILT COMPANY, INC.
NORWALK, CONNECTICUT
TWX 710 450 2840
1203 853-1400

January 2, 1975

Gentlemen:

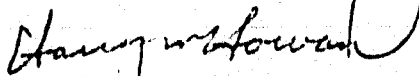
Effective January 2, 1975, in accordance with procedures laid down by the Occupational Safety and Health Administration of the U.S. Department of Labor in a letter of October 9, 1974, to the R. T. Vanderbilt Company, Inc. (copy attached), we hereby certify the following grades of talc:

NYTAL 99	X	425
NYTAL 100	3X	10A
NYTAL 100HR	151A	10AC
NYTAL 200	5X	HDT
NYTAL 300	FT	1R
NYTAL 400	MSK	1C
	325	

Please keep this certification with your permanent records. If you are inspected by OSHA, please show the inspector this letter, if he questions any of the above products.

Very truly yours,

R. T. VANDERBILT COMPANY, INC.



Harry W. Howard, Sales Manager
Paint and Paper Department

HWH:ld

enc.

CRMC-MAD-000659

R. T. VANDERBILT COMPANY, INC.
30 WINFIELD STREET
NORWALK, CONNECTICUT 06855

ABLE ADDRESS
NORWALK, CONNECTICUT
06855
NORWALK, CONNECTICUT
06855

January 2, 1975

Gentlemen:

In the course of our assuming the business of the former International Talc Company, we will continue to market five fibrous (asbestiform) type talcs previously supplied by them, namely:

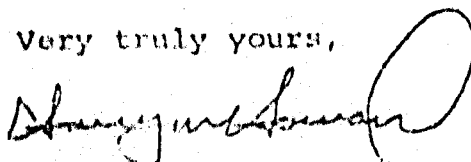
1. Fiber #1
2. Fiber #2
3. Mouldone
4. 6K Fiber
5. PL Fiber

We intend to label bags containing these products with an Asbestos CAUTION Label as follows:

CAUTION PRODUCT CONTAINS
ASBESTOS FIBERS. AVOID
CREATING DUST. BREATHING
ASBESTOS DUST MAY CAUSE
SERIOUS BODILY HARM.

As you know, the mineral fibers present in these grades, which make them industrially useful, are the asbestiform varieties of these minerals normally contained in commercial talc and consequently fall under Section 1910.93a, the OSHA Asbestos Standard.

Very truly yours,



Harry W. Howard, Sales Mgr.
Paint & Paper Department

HWI:LD

CRMC-MAD-000660

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
WASHINGTON, D.C. 20340



Office of the Assistant Secretary

OCT 6 1974

Mr. R. B. Vanderbilt
President
Chief Executive Officer
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 06855

Dear Mr. Vanderbilt:

This is in reply to your letter of September 26, concerning your request for relief from the asbestos standard for your talcs containing non-fibrous tremolite, actinolite, and anthophyllite.

My letter of August 6 stated that non-fibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the asbestos standard and, therefore, the provisions of that standard do not apply to talc containing non-asbestiform minerals.

NIOSH is currently conducting a thorough investigation into the exact minerals to which talc workers were exposed in those studies where asbestosis or other adverse medical effects were found.

Pending the receipt and evaluation by OSHA of the report by NIOSH on this investigation, if you have scientific evidence that the naturally occurring talcs, prior to processing by milling or crushing, do not contain fibrous or asbestiform tremolite, anthophyllite, actinolite or other asbestiform minerals, you may certify to your customers that the talc does not contain asbestos.

Fibrous, asbestiform minerals such as fibrous tremolite means naturally occurring asbestiform minerals which prior to or after crushing and processing, contain fibers made up of fibrils.

Sincerely,

John H. Stenler
Assistant Secretary of Labor

CRMC-MAD-000661

Johns-Manville

all per
Internal Correspondence

To: R. S. Lamar

Date: January 20, 1975

From: H. R. Keefe

Copies: P. A. Martinson, P. Kotin, E. M. Fenner, A. C. F. Finkbiner,
W. C. Streib, F. T. Solon, H. Kranich, D/C

Subject: Your Letter January 7, 1975
Talc and Asbestos

I am aware that the National Paint and Coatings Association carries no legal weight. Their bulletin, however, will cause us marketing problems which are obvious.

Concerning the talc label, we have no objection with a label for talc. It's the asbestos label which causes our problem. Stender's letters and the more recent letter from OSHA to its area personnel, in my opinion, attempts to remove tremolite in talc from the OSHA asbestos regulation. J-M Research and Medical Department, on the other hand, appear to be adamant in making sure tremolite is considered as asbestos.

I don't happen to be as convinced that tremolite as found in our talc is as dangerous as other forms of asbestos.

We estimate that as a result of our labeling with the asbestos label, we have lost 30 to 40 percent of our talc tonnage. We expect even further erosion of business.

Concerning contact with R. T. Vanderbilt and/or OSHA, F&M has nothing to say concerning disclosing the data you have. This decision was to be made by Legal, Medical, and Research.

The last meeting I attended concerning contact with Vanderbilt and/or OSHA was at the Research Center October 8, and it was my opinion Research was to put together the information you have and go to Washington to see Stender. I don't know who cancelled this plan, but it wasn't F&M.

H. R. Keefe

HRE:ccr

CRMC-MAD-000662

Johns-Manville Corporation

Greenwood Plaza
Denver, Colorado 80217

Health, Safety & Environment Department

February 10, 1975

Mr. W. H. Mortonson, Manager
Manufacturing & Technical Service
Flintkote
Building Products Group
Flooring & Industrial Products Div.
480 Central Ave.
East Rutherford, N.J. 07073

Dear Bill:

I have received your letter of February 5, regarding the recent OSHA Field Information Memorandum #74-92 on tremolite and talc.

Our interpretation of this OSHA Memorandum is that it relates solely to talc and asbestiform minerals found in talc. With that interpretation in mind, I have answered W. J. Dickenson's specific questions in his letter of January 31, 1975.

- (a) The 30 micron top limit for fiber length applies to any asbestiform fiber found in talc.
- (b) Yes - unless further examination by electron microscopy determined that the particle was truly fibrous or asbestiform.
- (c) No - This aspect ratio applies only to asbestiform fibers found in talc.
- (d) The over 5-micron minimum length used in the asbestos standard applies here.

Part 1 - Yes - for asbestos fiber determination. I assume the 1910.93a standard would apply to fibrous tremolite other than that found in talc.

Part 2 - Yes - to determine quantity of asbestiform or fibrous tremolite in talc. However, the aspect (length to diameter [width]) ratio must be 5 or more to 1. The 3 to 1 aspect ratio does not apply in this situation.

CRMC-MAD-000663

Mr. W. H. Mortonson
Page 2
February 10, 1975

Part 3 - No - not if counting asbestiform particles in talc.
The OSHA Laboratory may do this but it is not
necessary for talc users or producers.

Part 4 - Yes - but not gravimetric - microscopic light
field count only.

Mr. Dickenson also poses three questions in the last three
paragraphs of his letter. I have answered these also.

Mr. Dickenson questions gravimetric vs. impinger/microscopic
light field determination. By OSHA definition, talc
concentrations must be sampled by impinger and counted by
light field microscopy. However, OSHA utilizes respirable
mass (size-selective gravimetric) for most other mineral
dusts, particularly silica.

Midget impinger - No, the midget impinger is not the same
unit as Mine Safety Appliances gravimetric sampling kit.
The midget impinger is a small version of the Greenburg-Smith
impinger that has been used for many years for particulate
dust sampling. The MSA kit referred to is the size-selective
gravimetric sampler I mentioned in the paragraph above.

The National Institute for Occupational Safety and Health
gives training courses in occupational dust sampling.
Contact:

Mr. James S. Ferguson, Director
Division of Training
National Institute for Occupational
Safety & Health
Cincinnati, Ohio 45202.

If further information is needed, I suggest either you or
Mr. Dickenson call me in Denver.

Very truly yours,



Edmund M. Fenner, Director
Technical Affairs

EMF/emr

CRMC-MAD-000664

File w/ ltr from

Bill Westerson

CRMC-MAD-000665

JANUARY 31, 1975

MR. A.R. HOOKER, JR.
RUTHERFORD

W.J. DICKSON
RUTHERFORD

OSHA AIR SAMPLINGS:
TREMOLITE AND TALC

I have read the A.I.A. Field Information Memorandum #74-92, on the subject of Tremolite and Talc. The purpose of the Memorandum is to clarify policy changes regarding airborne particulate monitoring resulting from the letter from John H. Stender, Assistant Secretary of Labor, to Mr. H.B. Vanderbilt, President of the R.T. Vanderbilt Company, on October 9, 1974.

There are still questions, however, that I would like to have resolved, if possible.

- a) Is the 30 micron top limit for fiber length in the counting procedure applicable only for tremolite, or does it apply to all other fibers as well?
- b) Re the "bundle-of-sticks" classification of paragraph E: I have seen this effect fairly often with Chrysotile asbestos, very seldom with tremolite. If I observe a tremolite particle less than 3 microns thick, less than 30 microns long, and meeting the 5 to 1 length to width aspect ratio, would it be discarded from a fiber count if I could not discern that it is composed of fiber subdivisions, i.e., the "bundle-of-sticks" composition?
- c) Does the 5 to 1 length-to-width ratio in any way modify or replace the current 3 to 1 ratio as defined in Standard #1910.93a?
- d) Standard #1910.93a is applicable only to fibers over 5 microns in length. I see no minimum fiber length defined in Memorandum #74-92. Is there one?

A careful perusal of Standard #1910.93a and of Memorandum #74-92 leads me to believe that an airborne particulate monitoring report should now contain a minimum of four parts. I would like to know if my understanding is correct in this respect.

Part 1: - A fiber count for chrysotile and all types of amphibole asbestos, with the exclusion of all talc and tremolite. This would include all such fibers longer than 5 microns, with a length to width ratio of 3 to 1 or greater, and with no top limit for length (as defined in Standard 1910.93a).

Part 2: - Count on tremolite particles that appear as either indivisible or bundled fibers, judged to be neither chrysotile nor amphibole, that are no more than 3 microns

CRMC-MAD-000666

JANUARY 31, 1975

MR. A.R. HOOKER, JR.
RUTHERFORD

W.J. DICKSON
RUTHERFORD

OSHA AIR SAMPLINGS:
TREMOLITE AND TALC

PAGE 2

thick, no longer than 30 microns, that are more than 3 times longer than they are wide, but not longer than 5 times their width.

Part 3: - Count of tremolite particles that appear as either indivisible or bundled fibers, judged to be neither crystals nor slivers, that are no more than 3 microns thick, no longer than 30 microns, and that are five times or more longer than they are wide.

Part 4: - An air-impinger count, either gravimetric or light-field, of all non-fibrous or non-asbestiform talc and tremolite.

In addition to the above, please clarify the following: should we in the future be running routine air samplings by either gravimetric or light-field counts in all of our tile plants? (DUST)

Is the "midget impinger" referred to in A.I.A. Field Information Memorandum #74-92 the same unit as Mine Safety Appliance's Gravimetric Dust Sampling Kit #456241 (the mini-cyclone separator)?

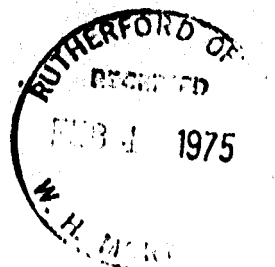
If we should be running these tests, how and where should we be obtaining the instruction and training that would qualify us to run them in the manner approved by OSHA and NIOSH?

Who in Flintkote would be responsible for conducting such a monitoring program at the various plants?

W.J. Dickson
W.J. Dickson

WJD:pb

cc: Mr. M.L. Johnson - Rutherford
Mr. W.H. Mortonson - Rutherford
Mr. J. Schmitt - White Plains
Mr. S. Weiss - White Plains



CRMC-MAD-000667



BUILDING PRODUCTS GROUP / FLOORING & INDUSTRIAL PRODUCTS DIVISION

480 Centra Avenue, East Rutherford, New Jersey 07073 (201) 438-2800

February 5, 1975

Mr. Edmund M. Fenner
Johns-Manville Corporation
Greenwood Plaza
Denver, Colorado 80217

Dear Ed:

I am attaching a photocopy of an interoffice letter from Mr. W.J. Dickson of my Technical Service Laboratory to Mr. A.R. Hooker, Jr. regarding the recent AIA Field Information Memorandum #74-92.

Mr. Dickson, who does our microscopic examinations for asbestos fiber count, has raised a number of questions involving interpretation of changes indicated in the above reference Memorandum. I am wondering if you would be kind enough to give us your opinion wherever possible on the questions he has raised. The last several questions in his letter, of course, are internal questions but the others do involve interpretation of policy as now stated by the Department of Labor.

I would appreciate any assistance you can offer us on the various questions in the attachment.

Very truly yours,

THE FLINTKOTE COMPANY

W.H. Mortonson, Manager
Manufacturing and Technical
Service

WHM:pb
Attach.

CRMC-MAD-000668



Johns-Manville

Internal Correspondence

To: P. Kotin, M. D.

Date: March 18, 1975

From: E. M. Fenner

Talc - Gen

Copies: File & C

Subject: BORG WARNER TALC SITUATION

Following your suggestion, I talked with John Dement of NIOSH this morning. The main points of information that John supplied are:

- (1) The talc being used by Borg Warner is R. T. Vanderbilt's NYTAL 200.
- (2) Both bulk and airborne samples were taken by the OSHA inspector.
- (3) Their X-ray and electron microscope examination of the talc showed no appreciable chrysotile but considerable amounts of tremolite and anthophyllite.
- (4) Their examination of the samples using the industrial hygiene analysis procedure from the OSHA asbestos standard and using the Stender revised definition of a fiber found approximately 40 fibers per cc in the airborne samples.

John Dement asked that we keep him apprised of developments in the talc situation.

CRMC-MAD-000669

To: J. H. Swensen

Date: April 22, 1976

From: R. S. Lamar

Copies: P. Kotin, E. M. Fenner, R. P. Carter, H. R. Keefe,
H. Kranich, D, C

Subject: REPRINT OF PAPER: "MORTALITY STUDY OF
TALC MINERS AND MILLERS" BY GIOVANNI F. RUBINO, ET. AL.
FROM THE JOURNAL OF OCCUPATIONAL MEDICINE, MARCH, 1976
VOL. 18, NO. 3, pp. 186 - 193

The attached reprint was sent to us from our good friend
W. H. Ashton, Johnson & Johnson Co.

There are several key points:

- (1) The studies of Kleinfeld, et. al. of New York state "talc" workers show that the incidence of carcinoma of the lung and pleura among these workers is about four times that of the general population.
- (2) These New York "talcs" are known to contain not only the mineral talc but also other silicates such as serpentine, tremolite, and anthophyllite. In this respect Kleinfeld's findings are misleading since the effects of exposure to talc mineral are not defined.
- (3) Rubino's studies, conducted among talc workers at Val Chisone, Italy, are far more definitive regarding exposure to pure talc mineral since these products contain at most only trace amounts of tremolite and chrysotile.
- (4) Rubino concludes from his studies that there is no cancerogenic effect attributable to pure talc (mineral).

It would be my recommendation that this information be used in our marketing efforts with Penhorwood. It would appear that Vanderbilt's problems are multiplying (not to mention our own with Desertalc).



R. S. Lamar



Johns-Manville

Internal Correspondence

To: H. R. Keefe - 2W

Date: January 7, 1975

From: R. S. Lamar

Copies: See end of correspondence

Subject: YOUR MEMO OF JANUARY 2, 1975 TO
P. KOTIN, " TALC AND ASBESTOS "

I cannot help but feel that some additional input from Research is needed here. Several points:

1. The National Paint and Coating Association is simply a trade organization. It carries no legal weight. We are still bound by the law as described in OSHA documents. It seems to me that Stender, in his letter of October 9, 1974, destroys his own organization. Until this confusion within OSHA is resolved, we have no choice but to comply with the law as written.
2. As I read the NP&CA Bulletin No. 20, I get two strong impressions:
 - a. Rather than clarifying the matter, as stated, they only add to my confusion.
 - b. Asbestos is not really asbestos, but it can be anything you want to call it, e.g., "commercial talc."
3. I am greatly concerned with the point raised by A. Finkbinder at our last meeting. This has to do specifically with the fact that we are "sitting" on information which shows quite conclusively that R. T. Vanderbilt's talc products contain not only tremolite, but significant amounts of chrysotile and anthophyllite as well. What might be J-M's legal responsibility by withholding such information? Refer to:

CRMC-MAD-000671

January 7, 1975

Memo October 9, 1974 V. E. Wolkodoff to R. S. Lamar
Report No. 414-T-33, October 4, 1974

Memo October 10, 1974 K. L. Jaunarajs to R. S. Lamar

Memo October 23, 1974 V. E. Wolkodoff to R. S. Lamar

Memo October 11, 1974 R. S. Lamar to V. E. Wolkodoff

Do we still intend to provide OSHA with this information on Vanderbilt's talc products? I also feel that we should provide this information to R. T. Vanderbilt.

4. Finally, the real question is medical in nature. From information I have from Kotin and Fenner, there is more than ample reason why we should label regardless of what the law might say. And, this could in time have a great deal to do with J-M's legal as well as its moral obligations.

I guess what I am really trying to say, Harry, is that the decision to label was right and should not be subject for reconsideration. We have to learn to live with it in a business sense regardless of how difficult this appears.



R. S. Lamar

kjm
attachment

cc:

P. Kotin	- 4N
F. J. Solon	- 4N
E. M. Fenner	- 4N
A. C. Finkbinder	- 5W
P. A. Martinson	- 2W
H. Kranich	- 2W
W. C. Streib	
File:	259-6.1

CRMC-MAD-000672



Johns-Manville

Internal Correspondence

To: P. Kotin

Date: January 2, 1975

From: H. R. Keefe

Copies: Listed Below

Subject: Talc and Asbestos

Attached is a letter we recently received from the National Paint and Coating Association. This letter has been sent to all members of this Association.

Please note Page 3 under Recommendations. We feel quite confident that R. T. Vanderbilt Company will certify that their talc does not contain asbestos per this paragraph.

A speedy resolution of the confusion caused by OSHA and their definition of a fiber is necessary so that we might have answers concerning our talc for our customers.

Harry R. Keefe

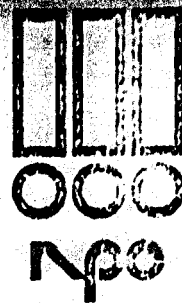
HRK:ccr

Attachment

cc: P. A. Martinson
H. Kranich
A. C. F. Finkbiner
F. J. Solon
R. S. Lamar ✓
E. M. Fenner
D/C

*Memo to H.R. Keefe
1/6/75
RSC.*

CRMC-MAD-000673



No. 20
December 5, 1974

TALC AND THE OSHA ASBESTOS STANDARD 1910.93a

**ROUTE TO:
Department**

Finance		
Administration		
Sales		
Technical		
Production		

Executive Synopsis

The OSHA Asbestos Regulation 1910.93a includes, in its definition of asbestos, a mineral form (tremolite) that is found in some talcs, but is not generally considered an asbestiform material (see Safety and Health Bulletin No. 15, "Asbestos Handling Guidelines" dated October 30, 1973). Through the extensive efforts of several NPCA members, a clarification of the regulation was obtained from OSHA. This now allows talc manufacturers to certify their material is "asbestos free" and the user of that talc is then exempt from regulation under 1910.93a.

ACTION REQUIRED BY YOU - Forward this Bulletin to the person or persons responsible for your safety and health operations.

ACTION TAKEN BY NPCA - Through the efforts of NPCA members and the Occupational Health Task Force a clarification of the standard was accomplished.

OPERATIONS AFFECTED IN YOUR COMPANY - Manufacturing, safety and health.

STAFF CONTACT AT NPCA - Richard W. Murry, Assistant Technical Director

CRMC-MAD-000674

BACKGROUND

With the promulgation of the asbestos Standard 1910.93a in July 1972 the possibility of certain talc materials being regulated as asbestos was created. According to the regulation, asbestos is defined as the following mineral forms: chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite. While some talcs are indeed marketed as containing asbestiform minerals and noted for their fibrous properties, the standard also encompassed other talcs not previously considered to be fibrous or considered to contain asbestiform materials. These are the tremolite (or more correctly non-asbestiform tremolite) containing talcs.

Since late 1972 the R. T. Vanderbilt Company Inc. and the International Talc Company (later purchased by Vanderbilt) have had numerous meetings with OSHA officials to obtain a clarification on the regulation of the talcs under 1910.93a.

RECENT DEVELOPMENTS

On October 9, 1974 in a letter to Mr. H. B. Vanderbilt, President of R. T. Vanderbilt Company, Inc., Mr. John Stender, Assistant Secretary of Labor, stated in part:

"...if you (the talc manufacturer) have scientific evidence that the naturally occurring talcs, prior to processing by milling or crushing, do not contain fibrous or asbestiform tremolite, anthophyllite, actinolite or other asbestiform minerals, you may certify to your customers that the talc does not contain asbestos." (A copy of the letter is attached to this bulletin.)

Also a directive to such effect has been issued to OSHA field personnel as a guide in making inspections. This directive indicates that if a talc user, i.e., a paint and coatings manufacturer, is monitored for asbestos the person behind the microscope counting fibers should use the following identification criteria:

- A. Particles must appear to be fibrous rather than as crystals or slivers.
- B. The maximum diameter of a fiber to be counted is 3 microns.
- C. The maximum length of a fiber to be counted is 30 microns.
- D. The length to width ratio must be 5 or more to 1, that is, 5 times or more longer than wide.
- E. The separate or individual fibers must contain fibrils or the "bundle of sticks" effect, unless they are at a nondivisible stage. A fibril cannot be subdivided and would be counted if it meets the other criteria. The electron microscope may be used to prove the fibrous nature of the particles. The length to width ratio of 5 or more is meant to imply that other particles are not hazardous.

Page 3

The directive further states that if the talc is of the non-asbestiform or non-fibrous variety the time weighted average (TWA) of 20 millions of particles per cubic foot of air (mppcf) will be used.

If monitoring of your operations using talc is done by the OSHA inspector you should retain a sample of the talc material being used in the event a discrepancy may arise.

RECOMMENDATION

If you have been using talc products that have been questionable regarding asbestos content, request certification from the manufacturer that they do not contain asbestos. |||

Retain this certification to show to an OSHA inspector if he questions the asbestos content of the talc. If it is however determined that a talc does contain true asbestiform minerals, that material will not be certified and is subject to the provisions of the regulation.

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
WASHINGTON, D.C. 20210



Office of the Assistant Secretary

OCT 9 1974

Mr. H. B. Vanderbilt
President
Chief Executive Officer
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 08855

Dear Mr. Vanderbilt:

This is in reply to your letter of September 26, concerning your request for relief from the asbestos standard for your talcs containing non-fibrous tremolite, actinolite, and anthophyllite.

My letter of August 6 stated that non-fibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the asbestos standard and, therefore, the provisions of that standard do not apply to talc containing non-asbestiform minerals.

NIOSH is currently conducting a thorough investigation into the exact minerals to which talc workers were exposed in those studies where asbestosis or other adverse medical effects were found.

Pending the receipt and evaluation by OSHA of the report by NIOSH on this investigation, if you have scientific evidence that the naturally occurring talcs, prior to processing by milling or crushing, do not contain fibrous or asbestiform tremolite, anthophyllite, actinolite or other asbestiform minerals, you may certify to your customers that the talc does not contain asbestos.

Fibrous, asbestiform minerals such as fibrous tremolite means naturally occurring asbestiform minerals which prior to or after crushing and processing, contain fibers made up of fibrils.

Sincerely,

A handwritten signature in dark ink, appearing to read "John H. ...".

John H. ...
Assistant Secretary of Labor

CRMC-MAD-000677



Johns-Manville

File: talc

Internal Correspondence

To:

[Redacted]

Date: February 17, 1977

From:

J. P. Leineweber 1-04

Copies:

R. Lamar 3-05 W. C. Streib R&D File Chrono

Subject:

PAPER BY C. S. THOMPSON
"ASBESTOS IN YOUR FUTURE"

I believe there is sufficient information in our files concerning our opinions on Dr. Thompson's campaign to convince the regulatory authorities that a fiber is not a fiber. This type of thinking is one of the reasons that industry in general, will continue to have a bad reputation in the eyes of those who sincerely want to protect the worker.

The quality of this Paper is typified by the illustrations of the asbestiform and non-asbestiform varieties of chrysotile and amosite. Obviously, a competent mineralogist would not let an error of this magnitude slip through.

A handwritten signature in cursive script, appearing to read 'J. P. Leineweber'.

J. P. Leineweber
/pa
Attachment

CRMC-MAD-000678



Johns-Manville

Internal Correspondence

File: Talc

To: E. M. Fenner, 1-06

Date: February 18, 1977

From: R. S. Lamar, 3-05

Copies: J. H. Swensen, J. P. Leineweber, W. C. Streib, D, C

Subject: Paper by C. S. Thompson
"Asbestos in Your Future".

Dr. Leineweber's comments on this paper, given in his memo to you dated February 17, 1977, are in my opinion correct but perhaps too mild.

One of the few technically correct statements made by Dr. Thompson appears on page three. I agree that chrysotile is not a member of the pyroxene group, but disagree with almost everything else said by Thompson.

I object strongly to an earlier statement on page three regarding "misinformation" supplied by a competitor. Furthermore, in all of Thompson's gobbledygook regarding the mineralogy of Vanderbilt's "talc" at no point does he admit to the fact that their "talcs" contain not only fibrous tremolite but chrysotile and anthophyllite as well. This we have proved by every available technique. These findings are well documented in numerous R&D reports.

I'm afraid that Dr. Thompson long ago gave up any professional ethics he might have had and is now persisting with a program that is not only technically false but even more tragic morally and ethically wrong. He totally ignores the medical consequences of his immorality.

R. S. Lamar

ib

Attachments all copies

CRMC-MAD-000679



Johns-Manville

Internal Correspondence

To: L. M. Fenner 1-06

Date: February 17, 1977

From: J. P. Leineweber 1-04

Copies: R. Lamar 3-057 W. C. Streib R&D File Chrono

Subject: PAPER BY C. S. THOMPSON
"ASBESTOS IN YOUR FUTURE"

I believe there is sufficient information in our files concerning our opinions on Dr. Thompson's campaign to convince the regulatory authorities that a fiber is not a fiber. This type of thinking is one of the reasons that industry in general, will continue to have a bad reputation in the eyes of those who sincerely want to protect the worker.

The quality of this Paper is typified by the illustrations of the asbestiform and non-asbestiform varieties of chrysotile and amosite. Obviously, a competent mineralogist would not let an error of this magnitude slip through.

J. P. Leineweber

J. P. Leineweber

/pa

Attachment

CRMC-MAD-000680

Asbestos in Your Future

by C. S. THOMPSON

Manager—Minerals, Ceramics and Paper R&D, R. T. Vanderbilt Co.

Reprinted from
the December 1976 issue of Mining Congress Journal

CRMC-MAD-000681

Asbestos in Your Future

by C. S. THOMPSON

Manager Minerals, Ceramics and Paper R&D, R. T. Vanderbilt Co.

To many, the title of these comments might infer a major discovery of new asbestos deposits, an increase in production, or new areas of application. However, others might suspect a more serious and sinister meaning, and, unfortunately, they are correct.

Relative to world asbestos production and reserves (with the exception of the huge ore body of short fiber in the New Idria serpentinite in California), the United States has always been a small contributor, involving a very limited number of mining companies. This situation appears likely to remain the case since nature, apparently, saw fit to distribute the majority of this unique and highly useful material elsewhere in the world.

"Asbestos" minerals created by regulations

However, in the last few years, since excessive exposure to asbestos has been shown to be a serious health hazard, the United States government, through various regulatory agencies, has promulgated and proposed numerous regulations that have created "asbestos" minerals where they have never existed before, and thereby caused essentially every mining company in this country to be an "asbestos" miner and "asbestos" miller. In most cases, this also makes them guilty of contaminating the environment with "asbestos" by dumping their tailings so that the natural weathering processes redistribute these newly invented "asbestos" minerals into the air, surface runoff and ground water. In the case of many miners and producers of industrial minerals these new "asbestos" materials are distributed into a wide variety of manufacturing operations as mineral fillers in paint, plastics, rubber, or as basic ingredients in cements, spackling compounds and ceramic products.

To understand how this startling situation has come about, let us examine the chronology of the chain of events which has occurred over the past few years.

Issuance of standard in 1972 starts chain of events

It all began with the issuance of the Occupational Safety and Health Administration (Osha) Asbestos Standard in July 1972,¹ based on the National Institute for Occupational Safety and Health (NIOSH) criteria document,² with the purpose of controlling human exposure to asbestos. Without the benefit of readily available mineralogical ex-

pertise (USBM, USGS, etc.), "asbestos" was defined as any one of six minerals.

Table 1 lists these six minerals showing the correct terminology for describing the asbestiform varieties of anthophyllite, tremolite and actinolite.

The first three minerals listed in the Osha document—chrysotile, crocidolite and amosite—designate specifically the fibrous or asbestiform varieties of their vastly more abundant non-fibrous counterparts. In contrast, the latter three amphiboles—anthophyllite, tremolite and actinolite—as listed erroneously, include all forms of these very common rock forming minerals which rarely occur in fibrous or asbestiform habit.

Table 1. "Asbestos" minerals as listed in Federal Register (Listed minerals are italicized)

<i>Asbestiform Variety</i>	<i>Chemical Composition</i>	<i>Non-Asbestiform Variety</i>
SERPENTINE GROUP		
<i>Chrysotile</i>	$Mg_3(Si_2O_5)(OH)_4$	Antigorite, lizardite
AMPHIBOLE GROUP		
<i>Crocidolite</i>	$Na_2Fe_3Fe_2(Si_8O_{22})(OH,F)_2$	Riebeckite
<i>Amosite</i>	$(Mg,Fe)_7(Si_8O_{22})(OH)_2$	Cummingtonite—grunerite
Anthophyllite		
asbestos	$(Mg,Fe)_7(Si_8O_{22})(OH,F)_2$	<i>Anthophyllite</i>
Tremolite		
asbestos	$Ca_2Mg_5(Si_8O_{22})(OH,F)_2$	<i>Tremolite</i>
Actinolite		
asbestos	$Ca_2(Mg,Fe)_5(Si_8O_{22})(OH,F)_2$	<i>Actinolite</i>

Simple error has created confused situation

It was this simple error which has been perpetuated by other agencies and is now being expanded through proposed regulations by both Osha and the Mining Enforcement and Safety Administration (Mesa) that has created the confused situation that exists today. This error was further complicated by defining a "fiber" as any mineral particle three times longer than it is wide (3:1 aspect ratio), through reference to the Niosh criteria document.

These simplistic definitions of "asbestos" and "fiber" were eagerly and immediately accepted by essentially all other agencies as illustrated by the proposed and/or prom-

ulated regulations listed in table 2. It is obvious from these documents that the majority of standard producing

Table 2. Initial Reaction. (Primary definitions covering asbestos exposures)

Agency	Date	Definitions
Osha	July 7, 1972 (Revised Oct. 18, 1972)	6 Minerals (See table 1) Fiber — 3:1 Length: width ratio — 5 Micrometers in length Same as Osha
USBM (Coal)	Nov. 7, 1972	Same as Osha
EPA (Air)	Apr. 6, 1973	Same as Osha Asbestos material — Asbestos or any material containing asbestos Asbestos tailings — Any solid waste product of asbestos mining or milling operations which contains asbestos

agencies are reluctant to develop definitions of their own and are perfectly satisfied to incorporate those promulgated by others even to the perpetuation and expansion of erroneous ones.

Bureau of Mines tried to clarify issue with symposium

The first major breakthrough in correcting the errors in the original asbestos definitions came as the result of a concerted effort by the Bureau of Mines to clarify the situation by holding a Symposium on Talc on May 8, 1973 in

Table 3. Turn about or Sidestep. (Secondary reactions concerning asbestos definitions)

Agency	Date	Definitions
EPA (Air)	May 3, 1974	Same as Osha Standard revised to include only "commercial asbestos," not operations where asbestos was a contaminant
USBM (Metal-nonmetal)	July 1, 1974	Only includes asbestiform varieties of six minerals. Recognizes existence of non-fibrous forms. Based decision on data presented at symposium on talc ³
Osha	Oct. 9, 1974 Nov. 21, 1974	Agreement with talc producer ⁷ Issued field memorandum ⁸ using five criteria for fiber identification (see table 4)
EPA (Air)	Oct. 25, 1974	Set exclusion level of one percent asbestos content ⁹
Mesa	Dec. 13, 1974	Issued memorandum requiring use of criteria similar to Osha for counting fibers

Washington, D.C.³ Numerous speakers presented data on the medical effects of talc and associated minerals on both humans and animals. Also, methods for the identification and classification of these minerals were discussed in detail.

Subsequent evaluation of all the presentations resulted in the Bureau of Mines publishing in the Federal Register of July 1, 1974 Amendments to the Asbestos Test Standard.⁴ Included were mineralogically correct definitions for asbestos and the recognized asbestos minerals (see table 3). This document stands today as the turning point and landmark in governmental regulation of minerals by

the realization that materials to be regulated must be correctly defined and described by the field of science to which they belong if meaningful standards are to be developed. To quote Professor Tibor Zoltai of the Department of Geology and Geophysics, University of Minnesota, in comments to the Minnesota Pollution Control Agency⁵ regarding the distinction between fibers of natural asbestos and of cleavage fragments:

Unfortunately, the misuse of some relevant mineralogical concepts and terms are becoming so widespread that it may be extremely difficult to correct them. However, if that is not done, some mineralogical concepts and expressions will have double definitions: one for mineralogists and physical scientists, and one for use in environmental public health sciences and practices.

The continuing use of these double definitions would be most unfortunate as it will undoubtedly lead to additional misunderstanding and conflict between mineralogists and geologists, on one side, and environmental and public health personnel on the other. As the concepts and expressions are mineralogical, the logical solution to this problem would be for the personnel in the second category to restrict themselves to the proper use of mineralogical terms.

On May 3, 1974, the Environmental Protection Agency (EPA) issued its "Revised National Standard for Asbestos Air Pollutant"⁶ in which the asbestos definition was side-stepped by stating that the standard was meant to deal only with "commercial asbestos" and that materials "containing asbestos as a contaminant only are not covered." They specifically mention talc mines and manufacturing operations and the "releases of asbestos from taconite milling operations" as being excluded from coverage.

Effort was made to correct error

In the meantime, through the diligent and consistent efforts of a small group of interested parties, Osha became aware of the errors in definition and the Department of Labor issued an agreement on Oct. 9, 1974⁷ with one industrial talc producer stating that "non-fibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the standard . . ." Soon thereafter, on Nov. 21, 1974, Osha issued a Field Information Memorandum⁸ recognizing the two forms of the amphibole minerals and listing five criteria to be used in deter-

Table 4. Criteria to be used by Osha in counting fibers

- Particles must appear to be fibrous rather than as crystals or slivers.
- The maximum diameter of a fiber to be counted is 3 microns.
- The maximum length of a fiber to be counted is 30 microns.
- The length to width ratio must be 5 or more to 1, that is, 5 times or more longer than wide.
- The separate or individual fibers must contain fibrils or the "bundle of sticks" effect, unless they are at a nondivisible stage. A fibril cannot be subdivided and would be counted, if it meets the other criteria. The electron microscope may be used to prove the fibrous nature of the particles. The length to width ratio of 5 or more to 1 is not meant to imply that other particles are not hazardous.

mining whether a mineral particle could be considered as fibrous or asbestiform. These are tabulated in table 4.

Osha's recognition of the problem as evidenced by these two documents and its repeated verbal assurances that correct mineralogical terminology and identification method would be incorporated into the asbestos amendment appeared to signal a real and welcome change in this agency's attitude toward the scientific correctness of its standards.

Very soon thereafter, on Dec. 13, 1974, Mesa issued "Health Division Instruction Memorandum No. 8—Definition of Asbestos Fiber for Tremolite Occurring in Talc," which listed criteria for fiber determination similar to those outlined in the Osha document. The year 1974 ended with a feeling of optimism that science had won out and that future regulatory documents dealing with "asbestos" would contain definitions and terminology that would limit their application to the true asbestos minerals upon which all medical data concerning human health hazards has been obtained.

Plan to rescind Labor Dept. agreement revealed

The first indication that all was not well was a thinly veiled threat early in 1975 that Osha was considering the rescinding of the Department of Labor agreement with the before mentioned talc producer and the withdrawal of Osha Field Information Memorandum #74-92. This maneuver was based on misinformation supplied by a competitor concerning the mineralogy of the talc products in question and on continuing pressure from Niosh which, to this day, insists on using only the simplistic 3:1 (length:width) criterion to define a fiber. A meeting was held with the then Assistant Secretary of Labor, John Stender, with all principals represented, at which Stender stated that as long as he held office both the agreement and Field Information Memorandum would remain in force. Stender left the Department of Labor soon thereafter.

Another document was brought to our attention late in the summer of 1975 by Bureau of Mines personnel. This was a study, commissioned by EPA, published by Battelle, Columbus Laboratories entitled "Identification and Assessment of Asbestos Emissions from Incidental Sources of Asbestos."¹⁰ This publication deals primarily with the occurrences of amphiboles, all lumped together under the subtitle of "Asbestiform Minerals of Interest." All amphiboles are grouped, regardless of crystalline form, because, the authors state, the excellent prismatic cleavage characteristic of all members of this mineral series (some 27 individual species) "causes the mineral to fragment into fibers." This statement is directly contrary to the principle, in general acceptance among mineralogists, that mineral fibers grow as fibers and that fibers are not generated from non-fibrous crystalline material by fragmentation. This paper goes on to discuss essentially all the major mining districts in the United States, state by state, with the consistent inference that the presence of amphiboles in any rock makes that rock a potential "incidental source of asbestos."

Proposed amendment to step

The shoe dropped on Oct. 9, 1975 (Black Thursday) with the issuance of the Osha proposed amendment to its

Asbestos Standard (see table 5).¹¹ Not only did Osha propose to take the step backward and use the aspect ratio as the sole criterion in defining a fiber but also to lower the threshold limit value (TLV) from 5 fibers/cm³ (this TLV was automatically dropped to 2 fibers/cm³ on July 1, 1976) to 0.5 fiber. In the preamble to this document Osha continues to show its lack of mineralogical expertise by

Table 5. Back to go and worse. (Most recent reactions concerning asbestos definitions)

Agency	Date	Definitions
Osha	Oct. 9, 1975	6 Minerals—No distinction as to crystalline form Fiber = 3:1 length:width ratio = >5 micrometers in length (negates field memorandum")
EPA (Air)	Oct. 14, 1975	No change from original—details disposal methods
EPA (Water)	Oct. 16, 1975	No change from original—groups wollastonite with asbestos for required effluent controls
Mesa (Metal-nonmetal)	June 29, 1975	Removes "asbestos" terminology and substitutes "mineral fiber" Mineral fiber = any mineral particle with a 3:1 aspect ratio or more >5 Micrometers in length <5 Micrometers in width

copying an asbestos definition from a New York Academy of Science publication dealing with the biological effects of asbestos rather than consulting a more appropriate mineralogical reference. The definition chosen was in gross error in that it included all pyroxenes, in addition to all amphiboles, and classified chrysotile as an example of the pyroxene group, which it is not. This inclusion of an additional group of minerals never before considered to be asbestos indicates the never ending attempts by some regulatory agencies to expand their jurisdiction indefinitely.

The Osha publication was followed in quick succession by two documents issued by the EPA on Oct. 14 and 16, 1975, dealing with "asbestos" contamination of air and water, respectively.^{12, 13} The former details the method of disposal of asbestos and any material containing more than one percent by weight of asbestos. The latter further modifies the effluent guidelines for mineral mining and processing numerous minerals including a category entitled "Asbestos and Wollastonite." This expansion of the inferred health hazard to a non-asbestos mineral apparently slipped by unnoticed by the industry since no counteracting comment has been discovered to date.

Mesa proposal would expand mining regulation

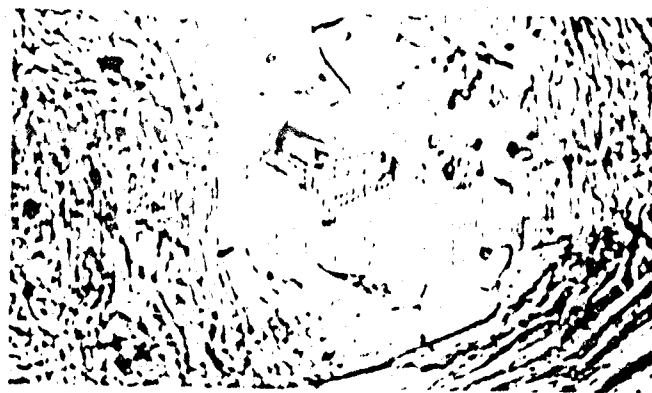
The latest in this long list of regulations ostensibly directed at reducing or eliminating exposure of the worker, consumer and the general public to "asbestos" is aimed directly at the mining industry by its own regulatory agency. The proposed Mesa regulation,¹⁴ presented to the Federal Mine Safety Advisory Committee in Birmingham, Al., June 29, 1976, would expand the asbestos regulations to cover essentially all minerals known to man regardless of composition.

Mesa would accomplish this very simply by removing the term "asbestos," which everyone has such a difficult

"ASBESTOS" MINERALS

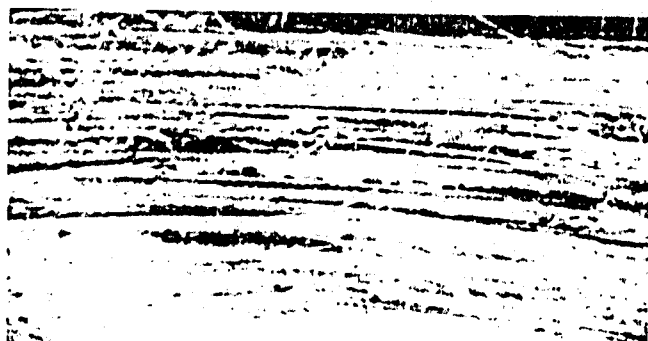
Asbestiform Variety

Chrysotile



Photomicrograph - 268x

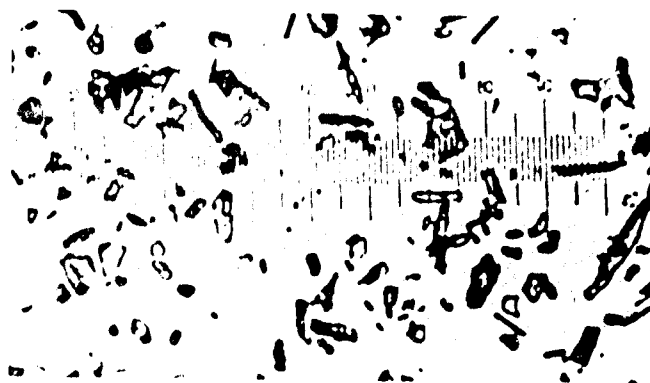
Amosite



Photomicrograph - 268x

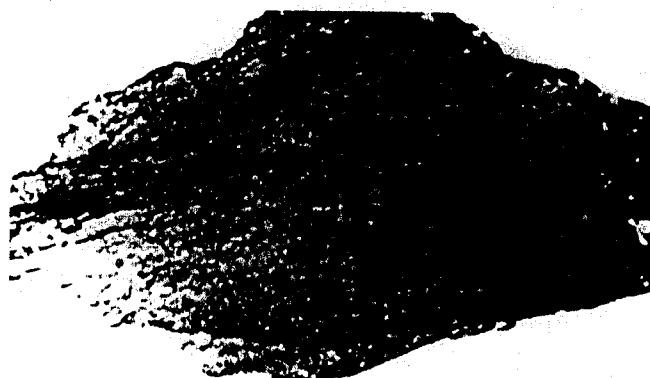
Non Asbestiform Variety

Cummingtonite



Photomicrograph - 268x

Riebeckite



Photomicrograph - 268x

time defining, from the standard and replacing it with two words, "mineral fiber." The agency would further simplify the regulator's task by defining a "fiber" as any "particle that exceeds 5 microns in length but not 5 microns in width, and shall have a length-to-width ratio of at least 3 to 1." While the terminology and definitions are altered, the requirements for handling these "mineral fibers" remain the same as those promulgated for true asbestos.

To my knowledge, there is no mineral assemblage being mined, milled, processed and either used as such or discarded as tailings that would not contain significant amounts of mineral particles which would be classified as "mineral fibers" using the Mesa definition. The majority of silicates, including those most common in mineral deposits (i.e. amphiboles, pyroxenes and feldspars), and numerous nonsilicates have, by nature, cleavage characteristics that cause them to elongate during comminution. Nature itself forms particles meeting Mesa's criteria through normal weathering processes.

Two points should be made quite clear at this time:

- All of the medical data concerning the nature and extent of health hazards related to asbestos exposure has been gained on:
 - truly asbestiform varieties of only four minerals, chrysotile, crocidolite, amosite and anthophyllite
 - groups of workers exposed to extremely excessive amounts of these asbestiform minerals, usually as mixtures of at least two types.
- No definitive medical data has been presented to indicate that comparable health hazards exist with respect to the non-asbestiform varieties of the true asbestos minerals. No references at all regarding exposures to tremolite or actinolite, in any form, were included in the list of 70 plus references listed in the Osha Asbestos Standard and the additional 42 containing "new information" in the proposed amendment. The extrapolation of hazard from three or four extremely rare forms of common minerals to the inclusion of cleavage fragments and particles of essentially all other minerals is entirely unwarranted.

Ramifications to mining boggle the mind

There are many ramifications of the present and proposed "asbestos" regulations, which would directly affect the mining industry, that may not be immediately apparent. As mentioned earlier, regulatory agencies show a great reluctance to develop definitions of their own and eagerly adopt those supplied by others. The EPA is using the 3:1 aspect ratio exclusively for the six listed "asbestos" minerals in its extensive study of water contamination by mines, mills and manufacturing facilities. At present, the EPA requires that any material containing one percent or more "asbestos" must be disposed of by covering with "at least 15 cm (ca. 6 in.) of non-asbestos

C. Sheldon Thompson is R&D Manager-Minerals, Ceramics and Paper Department, R. L. Vanderbilt Co. Thompson began his professional career in the field of mineralogy in 1955 as an assistant professor at Westminster College in Salt Lake City. Following that, Thompson served as research mineralogist-senior leader, Kennecott Copper Corp.; as research mineralogist-group manager, Union Carbide Corp. Mining and Metals Division. Thompson has a PhD from the University of Utah.



containing material . . . at the end of each operating day." Try to imagine the situation the mining industry would be in when the EPA starts to apply the proposed Mesa "mineral fiber" definition to the hundreds of thousands of tons of mine tailings and overburden dumped daily. Even worse, try to dream up a soil or cover of any kind which would not contain any "mineral fibers." Many state agencies try to improve on their federal counterparts by setting more stringent standards. The Illinois EPA, for example, requires that any "asbestos" containing material be disposed of in steel drums.

Every mining company would be affected

All the potential problems need not be elaborated on here. Everyone in the business of mining has been greatly affected by one or more of the multitude of safety and health regulations now on the books, but this latest "mineral fiber" proposal by Mesa is probably the only standard that affects every mining company in this nation. To make it worse, it is based on a lack of medical data, a totally unjustified extrapolation of hazard from fibers to non-fibers and a complete absence of mineralogical understanding and expertise.

In conclusion, I would urge the entire mining industry to support the efforts now being spearheaded by the AMC Noncoal Occupational Health Committee to counteract the ever growing umbrella of the "asbestos-mineral fiber" regulations. An AMC ad hoc subcommittee on "mineral fibers" has already made a presentation to the Federal Mine Safety Advisory Committee in Birmingham, resulting in the assignment of that topic to subcommittee for study. Continued efforts will be made to present any and all data which will aid all regulatory agencies, federal and state, to correct past errors in mineral definitions and to make use of the vast reservoir of mineralogical expertise in the U.S. Bureau of Mines and the U.S. Geological Survey in all future standards dealing with minerals. To accomplish this, the backing of the entire mining industry will be needed.

Almost everyone knows what asbestos is, but there seems to be a great many people in numerous regulatory agencies that do not know what "asbestos" is not. Unless these people are enlightened, most everyone who has not had "asbestos" in his past will find that he has "asbestos" in his future.

References

- ¹Federal Register, Vol. 37, No. 110, July 7, 1972, p. 11320-11322.
- ²Criteria For A Recommended Standard . . . Occupational Exposure To Asbestos, National Institute For Occupational Safety and Health, 1972.
- ³Proceeding of the Symposium on Tale, Washington, D.C., May 8, 1973. U.S. Bureau of Mines Information Circular 8639, 1974.
- ⁴Federal Register, Vol. 39, No. 127, July 1, 1974, p. 24316.
- ⁵Zoltai, Tibor and J. H. Stout. "Comments on Asbestiform and Fibrous Mineral Fragments, Relative to Reserve Mining Company Taconite Deposits." Minnesota Pollution Control Agency, Mar. 24, 1976.
- ⁶Federal Register, Vol. 39, No. 87, May 3, 1974, p. 15396.
- ⁷Letter to H. B. Vanderbilt from John H. Stender, Assistant Secretary of Labor, dated Oct. 9, 1974.
- ⁸Field Information Memorandum #74-92, Nov. 21, 1974, "Tremolite and Tale," Occupational Safety and Health Administration.
- ⁹Federal Register, Vol. 39, No. 208, Oct. 25, 1974, p. 38064-38073.
- ¹⁰Kuryvial, R. J.; R. A. Wood, and R. E. Barrett. "Identification And Assessment of Asbestos Emissions From Incidental Sources Of Asbestos." EPA-650/2-74-087, Battelle Columbus Laboratories, Sept. 1974.
- ¹¹Federal Register, Vol. 40, No. 197, Oct. 9, 1975, p. 47652-47665.
- ¹²Federal Register, Vol. 40, No. 199, Oct. 14, 1975, p. 48292-48302.
- ¹³Federal Register, Vol. 40, No. 201, Oct. 16, 1975, p. 48652-48668.
- ¹⁴Agenda for the 19th Meeting of the Federal Metal and Nonmetal Mine Safety Advisory Committee, June 29-July 1, 1976, Birmingham, Al.

001

Johns-Manville

File
Internal Correspondence

To: E. M. Fenner

Date: February 13, 1975

From: H. R. Keefe

Talc -
Den

Copies: P. A. Martinson, P. Kotin, W. B. Reitze, R. S. Lamar/
W. C. Streib, D/C

Subject: Talc Certification Letters

We are receiving letters, particularly from paint customers, requesting that we certify that our talc do not contain asbestos fiber. Considering the various statements contained in John Stender's letters and our meetings with OSHA to clarify the meaning of his statements, I propose to answer customer letters with the sample letter attached. Time is short as we need to answer our customers promptly and we are holding one letter dated January 10, 1975.

Please advise me by February 19, 1975 if you have objections to our sending this letter.

We do not have a copy of the photograph referred to in the sample letter and we are attempting to get some from Research.

Harry H. Keefe

HRK:ccr

Attachment

CRMC-MAD-000687

**Johns-Manville
Products Corporation**

Filtration & Minerals Division

Greenwood Plaza
Denver, Colorado 80217
(303) 770-1000

Gentlemen:

Thank you for your letter requesting certification that our Desertalc products do not contain asbestos. Please permit me to explain our position.

Our talc contains a mineral called tremolite. OSHA, in the Federal Register, defined asbestos and asbestos fiber as follows:

Asbestos includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite. Asbestos fiber means asbestos fibers longer than 5 micrometers.

Since our Desertalc contains tremolite with particles ^{longer} larger than 5 micrometers, we labeled our talc products as asbestos.

There had been and still is, much confusion as to whether or not tremolite is asbestos. John H. Stender, the Assistant Secretary of Labor, on October 9, 1974, stated:

Fibrous, asbestiform minerals such as fibrous tremolite means naturally occurring asbestiform minerals which prior to or after crushing and processing, contains fibers made up of fibrils.

On November 21, 1974, OSHA issued "Field Information Memorandum #74-92," copy attached. This Memorandum contains a policy change concerning tremolite in talc and what is to be considered asbestiform or fibrous. Section 2E states:

2. Policy Change:

In order to be considered asbestiform or fibrous the following criteria will be used by the Salt Lake City Laboratory of OSHA:

- A. Particles must appear to be fibrous rather than as crystals or slivers.
- B. The maximum diameter of a fiber to be counted is 30 microns.
- C. The maximum length of a fiber to be counted is 30 microns.

CRMC-MAD-000688

- D. The length to width ratio must be 5 or more to 1, that is, 5 times or more longer than wide.
- E. The separate or individual fibers must contain fibrils or the "bundle of sticks" effect, unless they are at a non-divisible stage. A fibril cannot be subdivided and would be counted, if it meets the other criteria. The electron microscope may be used to prove the fibrous nature of the particles. The length to width ratio of 5 or more to 1 is not meant to imply that other particles are not hazardous.

On December 17, 1974, Johns-Manville's Vice-President of Health, Safety, and Environment, Dr. Paul Kotin, wrote to Mr. John Stender requesting clarification and guidance on Section 2 of the Field Memorandum #74-92. Attached is Mr. Stender's replies to our questions.

We have attached a photograph of our Desertalc at 400X magnification. The long, stick-like particles are the tremolite in question. You will note they do not exhibit the "bundle of sticks" effect as mentioned in Mr. Stender's letter of January 13, 1975. Further, if we look at photographs of this talc at 10,000X magnification, we see stick-like particles of tremolite which would not be visible at 400X magnification. Therefore, the tremolite particles seen at 400X magnification are not at a non-divisible stage.

If, then, the tremolite particles viewed at 400X magnification do not contain the "bundle of sticks" effect and are not at a non-divisible stage, they should not be considered as asbestiform or fibrous.

Meetings between Johns-Manville and OSHA continue. We still have much confusion as to what is or is not fibrous. It is for this reason we can neither state that our talc contains asbestos fiber or does not contain asbestos fiber.

Please accept our apology for not answering your question directly. We are sure you can see the quandry we have. If you should have any questions, please contact us.

Sincerely yours,

Harry R. Keefe
Vice-President and General
Marketing Manager, Minerals

HRK:ccr
Attachment

CRMC-MAD-000689

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
WASHINGTON, D.C. 20210



Office of the Assistant Secretary

13 JAN 1975

Paul Kotin, M.D.
Vice President
Health, Safety and Environment
Johns-Manville Corporation
Greenwood Plaza
Denver, Colorado 80217

Dear Dr. Kotin:

This is in reply to your letters of December 17 and 19, 1974 regarding our Field Information Memorandum 74-92 of November 21, 1974.

You asked for further clarification and guidance and requested to meet with us to discuss the matter.

Our purpose in preparing the Field Information Memorandum was to provide guidance in distinguishing between fibrous and non-fibrous talc or tremolite.

Here are our comments to your observations:

- 2C Fiber length - We agree that fibers up to 200 micrometers in length should be counted, providing the diameter is not more than 3 micrometers.
- 2D The standard does not address length to width ratio. Five or more to one, length to width ratio is an arbitrary matter of convenience in counting to distinguish slivers or crystals from fibers. The three to one ratio provides some additional difficulty in distinguishing fibrous from non-fibrous. Again, length to width ratio and diameter are not in the present standard. Minimum length is stated in the standard as 5 micrometers. We see no need to change the standard because of Field Information Memorandum 74-92 of November 21, 1974.

CRMC-MAD-000690

- 2 -

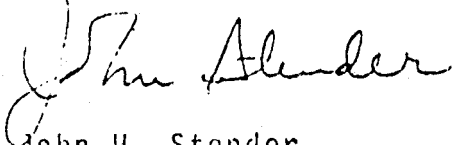
2E The "bundle of sticks" effect is mentioned in the literature as a distinguishing characteristic of fibrous minerals, as compared with very fine fibrous glass, for example. It can be seen under phase contrast microscopes with 400 X magnification, according to our laboratory in Salt Lake City.

Only in cases where further proof is needed would electron microscopy be used. This advice was given to the Occupational Safety and Health Administration (OSHA) field offices and laboratory. Field Information Memoranda are available to the public, but are primarily for guidance to OSHA staff. You are under no requirement to use electron microscopy, nor are your customers. OSHA reserves the right to use it to prove that a mineral is fibrous or non-fibrous.

The asbestos standard is being studied for possible revision. Your comments will be considered in revising the standard at a later date.

Please arrange to meet with Dr. Daniel Boyd, Mr. John P. O'Neill, Mr. Harry Gilbert, Mr. Ray McClure, Mr. Richard Wilson, and Mr. Howard Schulte, Deputy Assistant Secretary of Labor, on this matter. You may contact Mr. Schulte, area code 202-961-2144, for the time and place.

Sincerely,



John H. Stender
Assistant Secretary of Labor

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
WASHINGTON, D.C. 20210



November 21, 1974

FIELD INFORMATION MEMORANDUM #74-92

TO: OSHA Assistant Regional Directors and Area Directors

SUBJECT: Tremolite and Talc

1. Background:

The attached letter from Assistant Secretary of Labor John H. Stender gives further policy guidelines in regard to tremolite and talc that are not asbestiform or fibrous.

2. Policy Change:

In order to be considered asbestiform or fibrous the following criteria will be used by the Salt Lake City Laboratory of OSHA:

- A. Particles must appear to be fibrous rather than as crystals or slivers.
- B. The maximum diameter of a fiber to be counted is 3 microns.
- C. The maximum length of a fiber to be counted is 30 microns.
- D. The length to width ratio must be 5 or more to 1, that is, 5 times or more longer than wide.
- E. The separate or individual fibers must contain fibrils or the "bundle of sticks" effect, unless they are at a non-divisible stage. A fibril cannot be subdivided and would be counted, if it meets the other criteria. The electron microscope may be used to prove the fibrous nature of the particles. The length to width ratio of 5 or more to 1 is not meant to imply that other particles are not hazardous.

3. Sample Collection and Submission:

If the Compliance Safety and Health Officer (CSHO) is reasonably sure that the talc or tremolite is fibrous or asbestiform, he will sample following the OSHA Sampling Data Sheet #2 for asbestos.

CRMC-MAD-000692

In all other cases for talc or tremolite, he will (1) sample following the Sampling Data Sheet #2 for asbestos and (2) sample using the midget impinger for non-asbestiform, non-fibrous talc or tremolite. When impinger samples are taken, an air sample must be collected following OSHA Sampling Data Sheet #3 for crystalline silica for determining the percent quartz at the Salt Lake City OSHA Laboratory.

Midget impinger samples must be analyzed within 24 hours after collection for the results to be valid. Therefore, arrangements must be made by the Industrial Hygienist with a local laboratory concerning the analyses prior to making the inspection. These samples are not to be sent to the OSHA Laboratory, Salt Lake City; they will not be analyzed there. If the Industrial Hygienist is certain that the talc or tremolite is asbestiform or fibrous, impinger samples may be omitted from the inspections.

4. Results and Interpretation

- (1) Results from the impinger samples will be used if the talc or tremolite is non-asbestiform or non-fibrous. Table G-3 of 1910.93 would apply. The Time Weighted Average (TWA) for talc or tremolite that is non-asbestiform, non-fibrous is 20 millions of particles per cubic foot of air by the light-field count method.
- (2) The laboratory will give two results for the talc or tremolite that is asbestiform or fibrous submitted for analyses of asbestos. One for definite asbestiform fibers meeting the criteria of 5 or more to 1 and one for those fibers meeting the older asbestos criteria, namely those particles having a length to width ratio of 3 or more to 1. Samples having a 5 or more to 1 length to width ratio and meeting the other criteria of paragraph #2 Policy Change would mean that fibrous or asbestiform talc or tremolite is present. Therefore, the standard for asbestos, 1910.93a, would apply.

This guidance is temporary and may change as a result of findings from an on-going NIOSH study on this subject.

CRMC-MAD-000693

Any questions may be directed to Mr. Charles McClure, Division of Occupational Health Programming, Occupational Safety and Health Administration, Washington, D. C. 20210, telephone 202-961-2726.

Richard P. Wilson

for Barry J. White
Associate Assistant Secretary
for Regional Programs

Attachment

CRMC-MAD-000694



**Johns-Manville
Sales Corporation**

Ken-Caryl Ranch
Denver, Colorado 80217

Edmund M. Fenner
Vice President
Director, Environmental Services
Health, Safety & Environment Department

November 23, 1976

Mr. R. H. Mereness
Executive Director
Asbestos Information Association/NA
1835 K Street, N.W.
Washington, DC 20006

Dear Bob:

Attached is a brief report of our Task Group meeting
in Denver on Tuesday, November 16. Please call me
if you have any questions.

Very truly yours,

EMF:jh
Encl.

CRMC-MAD-000695

Report of Meeting of the Task Group on
Naturally Occurring Inorganic Fibers of
ASTM Committee E-34

A copy of the agenda for this meeting is attached. A list of meeting attendees is also attached.

Most of the meeting was devoted to review of the tenth draft of the Standard for Occupational Exposure to Asbestos. After the resolution of a few minor points in the draft, the meeting was confined to a discussion of the exposure limits that ASTM would recommend. It was finally agreed that this could not be resolved at the meeting, and that it would be necessary to ballot by letter all members of the Task Group to determine which of the two following proposals should be adopted.

1. All Uses - 2 fibers longer than 5 microns per cubic centimeter 8-hour time-weighted average.

10 fibers longer than 5 microns per cubic centimeter ceiling concentration.

2. Mining and Milling - 5 fibers longer than 5 microns per cubic centimeter 8-hour time-weighted average.

10 fibers longer than 5 microns per cubic centimeter ceiling concentration.

Product Manufacturing and End Use - 2 fibers longer than 5 microns per cubic centimeter 8-hour time-weighted average.

10 fibers longer than 5 microns per cubic centimeter ceiling concentration.

The meeting was adjourned at 12:00 Noon. The next meeting was tentatively scheduled for March 8, 1977 at Kennedy International Airport in New York City.

Attendees

Chairman - A. A. Winer, Department of Energy, Mines
and Resources, Canada

Vice Chairman - E. M. Fenner, Johns-Manville Corp. & AIA/NA

Secretary - Marcel Cossette, QAMA

G. F. A. Brink, QAMA & Asbestos Corp.

P. Laroche, Lake Asbestos

A. E. Martin, M.D., NIEHS

Rita Orsel, Consumer Products Safety Commission

Bernard Lincoln, T-N Ltd.

A. M. Harvey, R. T. Vanderbilt

H. D. Stanley, Pfizer

H. H. Kaufman, GAF

R. A. Clifton, BU Mines

CRMC-MAD-000697

AGENDA

15th meeting

TASK GROUP ON NATURALLY OCCURRING
INORGANIC FIBERS16 November 1976
Denver CO.

- ✓1. Chairman's opening remarks
- ✓2. Minutes of the last meeting
- ✓3. Business arising out of the minutes
- ✓4. Review of the tenth draft
5. Task Group membership
6. Old business
7. New business
8. Date and place of the next meeting.



Johns-Manville

OSHA Asbestos
Internal Correspondence

To: E. M. Fenner
R. P. Carter

Date: August 28, 1974

From: G. L. Swallow

F. J. Solon, Jr.
Copies: W. B. Reitze
File & Chron

Subject: CONVERSATION WITH HOWARD J. SCHULTE/OSHA, AND RAY McCLURE/OSHA
REFERENCE: JOHN STENDER'S LETTER OF AUGUST 6, 1974, TO
MR. H. B. VANDERBILT, R.T. VANDERBILT CO., INC.

In response to your request, I called Howard Schulte and discussed with him the subject letter. He was obviously entirely familiar with it.

Mr. Schulte stated that the whole interpretation of the letter hinges upon the definition of "asbestiform" and "non-asbestiform".

In response to my question as to what was the current definition of asbestiform, or differentiation between asbestiform and non-asbestiform, he stated that the definition is the same as previously used in conjunction with the asbestos regulations, specifically that the aspect ratio be 3:1 or greater, and that the length be greater than 5 microns. He amplified his definition by saying that if a talc sample were examined under a microscope and more than 5 artifacts/cc were counted, which fit this definition, it would be termed a violation of the OSHA regulations. When I pressed him concerning the difference between artifacts and tremolite, he stated that, "We cannot take tremolite from the standard at this time." He further stated that OSHA technicians have never seen artifacts which fit the above definition which they consider to be non-tremolitic.

He stated that NIOSH is currently studying the possibility that there do exist non-tremolitic "slivers" which should be differentiated from the tremolitic fibers and which, because they are (perhaps) not a health hazard, should not be counted when evaluating a talc sample. However, the results of this study are one to two years off.

In answer to my query, he stated that the Vanderbilt Company argued the above point, namely that such "slivers" do exist and that it is inaccurate and unfair to include them in any fiber counts associated with talc sampling. He went on to say that despite Vanderbilt's arguments, OSHA was not going along with this concept, unless and until the NIOSH study mentioned above confirmed it.

As our conversation drew to a close, Mr. Schulte suggested that since I had asked so many detailed and technical questions, it would be well for me to talk to Ray McClure. He told me that he would have Ray call me later today.

CRMC-MAD-000699

E. M. Fenner/R. P. Carter
August 28, 1974
Page Two

Later this morning, Ray McClure called and referred to my conversation with Howard Schulte.

He started by explaining that the Vanderbilt mining operations are under the jurisdiction of MESA, not OSHA. Their concern with the OSHA regulations is because of their customers who have read the asbestos regulations and are worried about being cited in their plant operations because of possible tremolitic content in the talc.

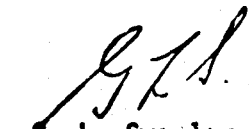
Mr. McClure said that John Stender's letter of August 6, 1974, was an attempt to give some relief for this situation, but doubted that it did so very effectively.

He stated that he was presently urging certain modifications to the standard as presently written. His recommendations are to NIOSH, and must be approved by NIOSH before they can be seriously considered or promulgated. In answer to my question as to what specifically he was recommending, he cautioned me to realize that these were wholly tentative and stated that they were:

1. Revise the aspect ratio in the fiber definition (as associated with talc) from 3:1 to 5:1. He noted that such a recommendation would be contingent upon NIOSH opinion regarding the health aspect.
2. Do not count any fibers whose diameter is greater than 5 microns.
3. Require that the microscopist attempt to make positive identification of fibers as being asbestos particularly by means of observing the fiber end configuration.

He stated that the Salt Lake City laboratory consists chiefly of OSHA people, now, and that the microscopists already attempt to differentiate between true tremolitic fibers and other non-fibrous artifacts which would be classified as fibers if judged only by aspect ratio and length. (Please note the discrepancy between this note and Howard Schulte's)

Mr. McClure stated that if the above changes are successfully promulgated, the standard will probably require sampling by the "asbestos technique" and by impinger. Whether or not a given station is over TLV will be judged by whichever criterion is stricter. OSHA is also considering requiring high volume air samples to permit chemical or mineralogical analysis of the airborne dust.


G. L. Swallow
GLS/jmb

CRMC-MAD-000700

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
WASHINGTON, D.C. 20210



Office of the Assistant Secretary

August 6, 1974

Mr. H. B. Vanderbilt
President
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 06855

Dear Mr. Vanderbilt:

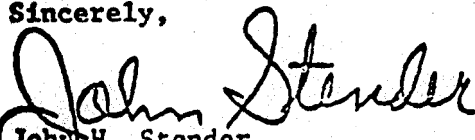
Your request for an interpretation of the asbestos standard, section 1910.93a, as it related to tremolite talc has been given deep consideration.

The following interpretation of the standard, 1910.93a, is collectively the opinions of both the Occupational Safety and Health Administration and the National Institute for Occupational Safety and Health.

The present asbestos standard is written for the purpose of controlling exposures to the fibrous or asbestiform minerals commonly considered to be asbestos. This is reflected in the established permissible limit for asbestos air contamination to which a worker may be exposed. This is expressed in terms of numbers of fibers in excess of a prescribed length per unit of volume. The required method of determination or analysis is also expressed as a method for counting fibers.

Therefore, nonfibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the existing standard. Talc containing only non-asbestiform tremolite is not regulated by the standard 1910.93a. For emphasis, if only talc and non-fibrous tremolite are present, there is no violation of the asbestos standard. Talc containing asbestiform tremolite or other fibrous asbestos minerals will be regulated by the standard 1910.93a.

Sincerely,


John H. Stender
Assistant Secretary of Labor

CRMC-MAD-000701

To: P. Kotin, M.D.

Date: April 8, 1975

P. Carter *PC*

Copies: File & Chrono

Subject: MONTHLY ACTIVITY REPORT
DIRECTOR, GOVERNMENT AFFAIRS
MARCH, 1975

FDA REGULATION OF GLASS FIBER FILTERS

The Food and Drug Administration promulgated a regulation restricting the use of glass fiber filters in the manufacture of parenteral drugs. Met with J-M's Washington law firm to prepare a notice contesting this regulation. Met with various FDA officials to ascertain why this regulation was promulgated.

PVC PIPE MIGRATION STUDIES

Prepared and sent letters to both EPA and FDA reporting the results of Phase II of J-M's PVC pipe (VCM migration) studies. Met with EPA and FDA officials along with Randy Prust of R&D to review our test results. No objections were received from either agency as to J-M's test procedures or results. EPA has agreed to conduct field studies in communities supplied drinking water through PVC pipe.

UNI-BELL BOARD OF DIRECTORS MEETING

Delivered a presentation to the Board of Directors of Uni-Bell on J-M's PVC pipe migration studies and a prognosis of actions by EPA and FDA on PVC pipe. The member companies of Uni-Bell agreed to supply necessary data to EPA for PVC pipe field studies.

FEDERAL TRADE COMMISSION - TALC LABELING

Met with two members of the FTC staff along with Aaron Finkbiner to discuss the possibility of the FTC bringing suit against R. T. Vanderbilt Company for false certification of their talc.

FDA REGULATION OF TALC CONTAINING ASBESTOS

As a result of studies conducted by J-M, the FDA published a notice in the Federal Register withdrawing its proposed regulation restricting the use of talc containing asbestos in food and drug packaging paper and paperboard.

CRMC-MAD-000702



Johns-Manville

Internal Correspondence

REC'D	
S. SPEIL	
REF. TO	

[Handwritten signature: J. P. Lammach]

To: W. C. Streib, R&D Center

Date: December 2, 1974

From: R. S. Lamar, R&D Center

Copies: See End of Correspondence

Subject: TELEPHONE CONVERSATION NOVEMBER 26, 1974 WITH BOB
R. T. VANDERBILT COMPANY REGARDING CHANGE IN OSHA
TREMOLITE TALC

BACON,
POLICY -

Bob Bacon had been trying to reach Dick Carter to inform him of a basic policy change within OSHA. Bacon has within the last few days received a copy of an OSHA Information Memo, dated November 21, 1974, directed to all OSHA field managers. The memo is too long and complicated to reproduce here. Bacon promised to mail a copy to me.

There are, however, a number of key changes in policy that would appear to bear directly on our decision to label our talc products:

1. Only fibers not slivers or acicular particles will be counted.
2. Fibers must be composed of fibrils and must exhibit frayed ends. If necessary TEM's will be used to identify frayed ends of fibers. Under this definition tremolite in no way can be counted as a fiber.
3. Only fibers greater than 3 μ diameter and 30 μ in length shall be counted. *less than* *wrong*
4. A fiber must have an aspect ratio greater than 5/1 (not 3/1).

Beyond just compliance with the law what now is J-M's moral obligation?

R. T. Vanderbilt Company is still very upset with our decision to label. Bacon now feels more strongly than ever before that they are not subject to the law and that neither is J-M. I kind of like our present "Mr. Kleen" stature.

[Handwritten signature: R. S. Lamar]

R. S. Lamar

rr

See Distribut' on Reverse Side

CRMC-MAD-000703

CR
XERO ALL FOR ENVIRONMENTAL CONTROL COMMITTEE
Talc Labeling Memorandum of WB Reitz 4N
Area Sales Managers

September 20, 1974 *talc*

Harry R. Keefe

**CAUTION
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST.**

P. A. Martinson, H. Kranich, N. B. Scheffel, T. E. Remmers, D/C
SERIOUS BODILY HARM.

Talc Label

This commercial talc product contains fibrous
tremolite, which has been classified by OSHA.

All shipments of Desert Minerals Talc shipped from Los Angeles
or Dunn will bear the attached label effective November 1,
1974. The attached letter should/must be sent to all carload
and significant LCL customers by October 1, 1974. Please
direct letters to an individual, by name instead of just to
the corporate name where possible.

The use of the asbestos label is required by law. I believe
you all know the reasons why we have to use this particular
label but if you have any questions, please call me.

The label may have a serious effect on our talc business.
Please report any/all reactions to the label, particularly
adverse reactions.

Initially, the label will be a paste-on. When we re-order
bags, the label will be imprinted. We will use a stamp with
water soluble ink for cyclonized shipments in white, repulpable
bags.

On the good side, the FDA has accepted our migration data on
tremolite talc in paper and it is expected that within the
next three months they will publish a position paper in the
Federal Register stating there is no need for a regulation
banning the use of talc in food packaging. More information
on this will be sent to you shortly.

Harry R. Keefe

HRK:ccr

Attachment

CAUTION

**CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST.
BREATHING ASBESTOS DUST MAY CAUSE
SERIOUS BODILY HARM.**

This commercial talc product contains fibrous tremolite, which has been classified by OSHA as an asbestiform mineral. Compliance with OSHA standards and regulations for exposure to asbestos and compliance with any state and local standards which may exist is required.

CAUTION

**PROLONGED EXPOSURE TO EXCESSIVE
QUANTITIES OF TALC DUST ALONE MAY
BE INJURIOUS TO HEALTH. AVOID
CREATING AND BREATHING TALC DUST.
RESPIRATORS OR DUST MASKS APPROVED
BY NIOSH OR THE BUREAU OF MINES
ARE RECOMMENDED.**



**Johns-Manville
Products Corporation**

Filtration & Minerals Division

**Greenwood Plaza
Denver, Colorado 80217
(303) 770-1000**

Our California talcs contain varying percentages of tremolite, a crystalline mineral which mineralogically has been defined as an amphibole of asbestos.

Accordingly, effective November 1, 1974, all bags of Desert Minerals Talc shipped from our California plants will be labeled with an asbestos caution notice. Since the major percentage of the mineral in the bag is talc, we have also included on the label a caution notice concerning the inhalation of talc dust.

Below is the text of the label which will appear on our bags:

CAUTION

**CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST.
BREATHING ASBESTOS DUST MAY CAUSE
SERIOUS BODILY HARM.**

This commercial talc product contains fibrous tremolite, which has been classified by OSHA as an asbestiform mineral. Compliance with OSHA standards and regulations for exposure to asbestos and compliance with any state and local standards which may exist is required.

CAUTION

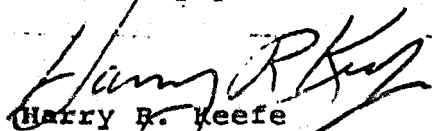
**PROLONGED EXPOSURE TO EXCESSIVE
QUANTITIES OF TALC DUST ALONE MAY
BE INJURIOUS TO HEALTH. AVOID
CREATING AND BREATHING TALC DUST.
RESPIRATORS OR DUST MASKS APPROVED
BY NIOSH OR THE BUREAU OF MINES
ARE RECOMMENDED.**

CRMC-MAD-000706

—Page 2

If you should have any questions, please do not hesitate to contact us.

Sincerely yours,



Harry R. Keefe
Vice-President and General
Marketing Manager, Minerals

HRK:ccr

CRMC-MAD-000707

C.J. Sulewski

Dec August 21, 1974

P.A. Martinson

TALC LABELING

H.R. Keefe and the writer met this date with J.F. Solon, R.P. Carter, and E.M. Fenner.

There is obviously considerable confusion on the total subject including the interpretation of the definition of an asbestos fiber.

It is recognized that the 1972 OSHA regulation clearly requires that talc containing asbestos fiber must be labeled. However, M.E.S.A., who has published the same definition of asbestos fiber as OSHA, has advised R.P. Carter that in all of the talc samples they have analyzed thus far, they have detected no tremolite fibers in accordance with their unpublished and informal definition of a fiber. Apparently, some governmental agencies interpret the definition in another manner than literally.

Because of this confusion, Filtration and Minerals management to date has delayed labeling Desertalc products.

In consideration of the many facets, including continued confusion, brought out at today's meeting, the writer is making the decision to further delay labeling to not later than November 1, 1974, providing a label is required and this requirement subject to clarification based on investigations and findings as follows:

1. R.P. Carter to contact R. Bacon of R.T. Vanderbilt Company to determine status of visit by OSHA and NIOSH people to their plant for the purpose of taking samples for analysis.
2. R.P. Carter to contact Mr. Boyd of OSHA regarding talc sampling -- the source of samples - whether air samples (plant or mine or both, etc.).

Also, details of methodology for sample evaluation, analytical or other.

CRMC-MAD-000708

3. With the information of Items #1 and #2 and through Mr. Solon and his people, a decision will be made what further sampling needs to be done in J-M operations -- plants or mines as well as finished product sampling and evaluation -- the latter using OSHA methodology.
4. R.P. Carter will follow with OSHA/NIOSH to determine results of sampling at R.T. Vanderbilt and determine if air sample analytical results are to be interpreted as representative of actual product sampling and evaluation.

All of above in attempt to have OSHA/NIOSH evaluate J-M talc on same basis as they evaluate R.T. Vanderbilt talc and for opinion from OSHA/NIOSH as to the question of: Does J-M talc contain asbestos fiber in OSHA/NIOSH's opinion?

It is expected that guidance from Solon's people on Item 1 through 4 will be available within the next 15 days and further procedural steps will be determined and implemented and all advised accordingly.

cc:

J.A. McKinney	-	5W
F.L. Pundsack	-	R&D
J.F. Solon, Jr.	-	4N
W.L. VanDerbeek	-	2S
Dr. Paul Kotin	-	4N
E.M. Fenner	-	"
R.P. Carter	-	"
W.B. Reitze	-	"
R.S. Lanar	-	R&D
S.R. Speil	-	"
W.C. Streib	-	"
H.N. Havens		
T.M. Jackson		
C.I. Keelan		
F.D. Richards		
D		
C		

JM Johns-Manville

Talc Labeling
Internal Correspondence

To: G. L. Swallow

Date: July 2, 1974

From: H. Kranich

Copies: See Below

Subject: Talc Labeling
Your Letter 6/24/74 to H. R. Keefe

Your letter seems to make it impossible to use our previously stated position and we will have to omit it from our announcement letter.

In effect, then, we have no "easy" response to customer queries other than they have to meet asbestos standards even though they may meet talc levels.

Is there any option left? Your letter refers to our own plant surveys--at a time when we had poorer control. Would new tests there be any different?

I seem to recall we (you) made checks at one to two customer work stations. Were these results any better?

Would you consider these questions in light/possibility any chance at all to salvage the qualifying statement?

I will hold off preparing the letter until next week. Please give me your advice and comment. Thanks.

HK
H. Kranich

HK:cor

cc: R. P. Carter, 4N
W. A. Cooper, 4N
E. M. Fenner, 4N
D. E. Hillier, 4N
T. M. Jackson, 2W
P. Kotin, M.D., 4N
R. S. Lamar, Research

R. W. McIndoe, 2W
W. B. Reitze, 4N
E. W. Schulmeyer, 2W
F. J. Solon, Jr., 4N
W. C. Streib, Research
R. B. VonWald, 5W
D/C

CRMC-MAD-000710



Johns-Manville

Internal Correspondence

To: R. G. Riede

Date: July 2, 1974

From: H. Kranich

Copies: See Below

Subject: Talc Labeling

We will need to label all talc shipments starting September 1, 1974. This to include:

1. Desertalc in bags
2. Bulk shipments
3. Products in white, repulpable bags

Plants will need to arrange for bag imprinting for deliveries on and after September 1, but not use before September 1. Until bags are in they will need to arrange to have glue-on labels prepared. Glue-on labels could be a problem for white beater bags. I can only suggest the making of a large rubber stamp (perhaps two) and use water soluble ink. Perhaps this may be obtained from bag supplier.

For bulk shipments we can use glue-on labels affixed somewhere to the truck or tanker for each delivery.

The copy for the label is attached. Some comments:

1. We want the imprint/label on the back of the bag, not the face.
2. The label is in two parts and should be slightly separated.
3. We want the notice to be small in dimensions (particularly in Cyclo products) but still has to be legible.
4. The capitalized portion should stand out.
5. I'd think the label and/or notice can be about 3½" x 4" in size, and still be legible.
6. As above, perhaps two rubber stamps for Cyclo. Stamp the talc caution below the asbestos in middle of bag.
7. Propose a local printer print up labels on "tan Kraft" color stock to match kraft bag color.

CRMC-MAD-000711

R. G. Riede
Page 2
July 2, 1974

Please let me know if I may advise further. Thanks.

Herb Kranich 

HK:ccr

P.S. Please send me couple label samples when run off.

cc: R. K. Comann
D. T. Tash
H. R. Keefe
N. B. Scheffel
R. P. Carter
W. A. Cooper
E. M. Fenner
D. E. Hillier
T. M. Jackson

P. Kotin
R. S. Lamar
R. W. McIndoe
W. B. Reitze 
S. W. Schulmeyer
F. J. Solon, Jr.
W. C. Streib
R. B. VonWald
D/C

CAUTION

**CONTAINS ASBESTOS FIBER
AVOID CREATING DUST.
BREATHING ASBESTOS FIBER MAY
CAUSE SERIOUS BODILY HARM.**

This commercial talc product contains fibrous Tremolite, which has been classified by OSHA as an asbestiform mineral. Adequate dust control as is currently required by OSHA mineral dust standards is recommended to bring this product into compliance with OSHA's standard for exposure to asbestos dust.

CAUTION

**PROLONGED EXPOSURE TO EXCESSIVE
QUANTITIES OF TALC DUST ALONE CAN
BE INJURIOUS TO HEALTH. AVOID
CREATING AND BREATHING TALC DUST.
RESPIRATORS OR DUST MASKS APPROVED
BY NIOSH OR THE BUREAU OF MINES ARE RECOMMENDED.**

Title 30—Mineral Resources
CHAPTER I—BUREAU OF MINES,
DEPARTMENT OF THE INTERIOR
SUBCHAPTER N—METAL AND NONMETALLIC
MINE SAFETY
PART 55—HEALTH AND SAFETY STAND-
ARDS—METAL AND NONMETALLIC
OPEN PIT MINES

Miscellaneous Amendments

Pursuant to the authority vested in the Secretary of the Interior under section 6 of the Federal Metal and Nonmetallic Mine Safety Act (30 U.S.C. 725) to develop, revise and promulgate health and safety standards for metal and non-metal mines, there was published on Wednesday, August 29, 1973, a notice of proposed rulemaking in the *FEDERAL REGISTER* (38 FR 23383 and 23384), to amend Part 55, Subchapter N, Chapter I, Title 30, Code of Federal Regulations, by revising and revoking certain standards currently in force and by adding new standards. Each of the standards contained in the notice was developed or revised after consultation with the Federal Metal and Nonmetal Mine Safety Advisory Committee appointed pursuant to section 7 of the Act (30 U.S.C. 726).

The notice further provided that each proposed standard which is to be a mandatory standard was so designated by the word "Mandatory" which appeared at the beginning of the standard and if a standard had been recommended by the Federal Metal and Nonmetal Mine Safety Advisory Committee, such standard was identified by the letters "MNMSAC." Under the provisions of subsection 6(e) of the Act (30 U.S.C. 725(e)) a standard recommended by the Advisory Committee was not subject to hearings.

Subject to the provisions of subsection 6(e) of the Act and in accordance with the provisions of subsection 6(d) (30 U.S.C. 725(d)) on or before the last day of the period fixed for the submission of written data, views, or arguments, any person who may be adversely affected by a proposed standard which had not been recommended by the Federal Metal and Nonmetal Mine Safety Advisory Committee was afforded an opportunity to file with the Secretary of the Interior written objections thereto stating the grounds for such objection and requesting a public hearing (subject to the Administrative Procedure Act) on such subject.

Interested persons were requested to submit written data, views, arguments and requests for hearings to the Administrator, Mining Enforcement and Safety Administration (MESA) on or before October 15, 1973. No hearings were requested on the proposed standards which were designated as "Mandatory" by the Secretary of the Interior, and all of the data, views and arguments received concerning the standards were given careful consideration.

The comments and recommendations received indicated support for the standards which are promulgated below. Promulgation of the proposed revision to standard 55.19-24 (38 FR 23384) con-

cerning wire rope attachments has been deferred so that the Department may undertake additional review, study and analysis of such changes prior to taking further action with respect to this standard. Most of the comments received were in response to proposed health standard 55.5-1 (38 FR 23383). As a result of these comments the following changes are made:

Standard 55.5-1. (a) Editorial changes have been made in paragraphs (a) and (b) to clarify the requirements of these provisions; and

(b) The Threshold Limit Values published in the 1972 edition of the American Conference of Governmental Industrial Hygienists publication have been updated to the Conference's 1973 edition which supersedes and replaces the 1972 edition; and

(c) An 8-hour time weighted average exposure of personnel to airborne concentrations of asbestos dust has been specified in paragraph (b); and

(d) The term "asbestos" as used in paragraph (b) is defined to include only chrysotile, amosite, crocidolite, anthophyllite asbestos, tremolite asbestos, and actinolite asbestos, or those minerals which are essentially known as asbestos minerals. The latter three minerals use the word asbestos because the same mineral name is used for both the asbestiform and non-asbestiform varieties of these minerals. Tremolite of a non-asbestiform which occurs in talc deposits is not mentioned in the definition and, therefore, is not covered.

NOTE: On May 8, 1973 a public symposium was held in Washington, D.C. to receive data on talc dust hazards in the metal and non-metal mining industries (see 38 FR 7822). Medical data based on both human and animal studies were presented. This data supported the opinion that talc and talc with tremolite are not as hazardous as chrysotile or other true asbestos minerals. The Mining Enforcement and Safety Administration and the National Institute of Occupational Safety and Health are planning a joint study to determine the toxic nature of talc and tremolite dust exposure. Pending the results of this study both fibrous talc and tremolite (non-asbestiform) are subject to the adopted threshold limit values under paragraph (a) of this standard (see page 33 of the Conference's 1973 publication).

(e) Paragraph (b) is further revised to provide the allowable peak or ceiling concentration of asbestos fiber. This ceiling concentration is 10 fibers longer than 5 micrometers, per milliliter of air, as determined by the membrane filter method over a sampling time of 15 minutes.

Effective date. The amendments, revisions and revocation of standards, and new standards shall become effective on July 1, 1974.

Part 55 of Chapter I of Title 30 of the Code of Federal Regulations is amended as set forth below:

(Sec. 6, Federal Metal and Nonmetallic Mine Safety Act; 80 Stat. 772; (30 U.S.C. 725))

Dated: June 26, 1974.

C. K. MALLORY,
 Deputy Assistant Secretary
 of the Interior.

Part 55, Title 30 Code of Federal Regulations is amended and revised as follows:

§ 55.5 [Amended]

1. Standard 55.5-1, promulgated on December 8, 1970 (35 FR 18587), is revised to read as follows:

55.5-1 Mandatory. Except as permitted by § 55.5-5:

(a) Except as provided in paragraph (b), the exposure to airborne contaminants shall not exceed, on the basis of a time weighted average, the threshold limit values adopted by the American Conference of Governmental Industrial Hygienists, as set forth and explained in the 1973 edition of the Conference's publication, entitled "TLV's Threshold Limit Values for Chemical Substances in Workroom Air Adopted by ACGIH for 1973," pages 1 through 54, which are hereby incorporated by reference and made a part hereof. This publication may be obtained from the American Conference of Governmental Industrial Hygienists by writing to the Secretary-Treasurer, P.O. Box 1037, Cincinnati, Ohio 45201, or may be examined in any Metal and Nonmetal Mine Health and Safety District or Subdistrict Office of the Mining Enforcement and Safety Administration. Excursions above the listed thresholds shall not be of a greater magnitude than is characterized as permissible by the Conference.

(b) The 8-hour time weighted average airborne concentration of asbestos dust to which employees are exposed shall not exceed 5 fibers per milliliter greater than 5 microns in length, as determined by the membrane filter method at 400-450 magnification (4 millimeter objective) phase contrast illumination. No employee shall be exposed at any time to airborne concentrations of asbestos fibers in excess of 10 fibers longer than 5 micrometers, per milliliter of air, as determined by the membrane filter method over a minimum sampling time of 15 minutes. "Asbestos" is a generic term for a number of hydrated silicates that, when crushed or processed, separate into flexible fibers made up of fibrils. Although there are many asbestos minerals, the term "asbestos" as used herein is limited to the following minerals: chrysotile, amosite, crocidolite, anthophyllite asbestos, tremolite asbestos, and actinolite asbestos.

(c) Employees shall be withdrawn from areas where there is present an airborne contaminant given a "C" designation by the Conference and the concentration exceeds the threshold limit value listed for that contaminant.

2. Standard 55.5-3, promulgated on December 8, 1970 (35 FR 18587), is revised to read as follows:

55.5-3 Mandatory. Control of employee exposure to harmful airborne contaminants shall be, insofar as feasible, by prevention of contamination, removal by exhaust ventilation, or by dilution with uncontaminated air. However, where accepted engineering control measures have not been developed or when necessary by the nature of work involved (for example, while establishing controls or occasional entry into hazardous atmospheres to perform maintenance or investigation), employees may work for reasonable periods of time in concentrations of airborne contaminants exceeding permissible levels if they are protected by appropriate respiratory protective equipment. Whenever respiratory protective equipment is used a program for selection, maintenance, training, fitting, supervision, cleaning, and use shall meet the following minimum requirements:

(a) Mining Enforcement and Safety Administration approved respirators which are applicable and suitable for the purpose intended shall be furnished, and employees shall use the protective equipment in accordance with training and instruction.

(b) A respirator program consistent with the requirements of ANSI Z88.2-1969, published by the American National Standards Institute and entitled "American National Standards Practices for Respiratory Protection ANSI Z88.2 1969," approved August 11, 1969, which is hereby incorporated by reference and made a part hereof. This publication may be obtained from the American National Standards Institute, Inc., 1430 Broadway, New York, New York 10018, or may be examined in any Metal and Nonmetal Mine Health and Safety District or Subdistrict Office of the Mining Enforcement and Safety Administration.

(c) When respiratory protection is used in atmospheres immediately harmful to life, the presence of at least one other person with backup equipment and rescue capability shall be required in the event of failure of the respiratory equipment.

3. Standard 55.6-5, promulgated on December 8, 1970 (35 FR 18587), is revised to read as follows:

55.6-5 *Mandatory*. Areas surrounding magazines and facilities for the storage of blasting agents shall be kept clear of rubbish, brush, dry grass, or trees (other than live trees 10 or more feet tall), for a distance not less than 25 feet in all directions, and other unnecessary combustible materials for a distance of not less than 50 feet.

4. New standard 55.6-12 is added to read as follows:

55.6-12 *Mandatory*. Prior to interior repair of facilities for storage of explosives, including blasting agents, all materials stored within the facility shall be removed and the interior cleaned. Prior to the exterior repair of such facilities, all materials stored within the facility shall be removed if there exists a possibility that such repairs may produce a spark or flame. The explosives removed from storage facilities to be repaired shall be placed either in other storage facilities appropriate for the storage of such materials under this section or a safe distance from the facilities under repair where they shall be properly guarded and protected until the repairs have been completed and the materials have been returned to storage within the facilities.

§ 55.8 [Amended]

5. New standard 55.8-6 is added to read as follows:

55.8-6 *Mandatory*. The oxygen intake coupling on jet-piercing drills shall be constructed so that only the oxygen hose can be coupled to it.

6. New standard 55.8-7 is added to read as follows:

55.8-7 *Mandatory*. The combustion chamber of a jet drill stem which has been sitting unoperated in a drill hole shall be flushed with a suitable solvent after the stem is pulled up.

§ 55.12 [Amended]

7. Standard 55.12-32, promulgated on July 31, 1969 (34 FR 12507) is made mandatory and revised to read as follows:

55.12-32 *Mandatory*. Inspection and cover plates on electrical equipment and junction boxes shall be kept in place at all times except during testing or repairs.

§ 55.15 [Amended]

8. Standard 55.15-12, promulgated on February 25, 1970 (35 FR 3664), is revoked.

§ 55.19 [Amended]

9. Standard 55.19-7, promulgated on July 31, 1969 (34 FR 12509) is revised to read as follows:

55.19-7 *Mandatory*. All man hoists shall be provided with devices to prevent overtravel. When utilized in shafts exceeding 100 feet in depth, such hoists shall also be provided with overspeed devices.

10. New standard 55.19-13 is added to read as follows:

55.19-13 *Mandatory*. Where any diesel or similar fuel-injection engine is used to power a hoist, the engine shall be equipped with a damper or other cutoff in its air intake system. The control handle shall be clearly labeled to indicate that its intended function is for emergency stopping only.

11. Standard 55.19-26, promulgated on July 31, 1969 (34 FR 12509) is made mandatory and revised to read as follows:

55.19-26 *Mandatory*. Safety device attachments to hoist ropes shall be selected, installed, and maintained according to manufacturers' specifications to minimize internal corrosion and weakening of the hoist rope.

12. New standard 55.19-109 is added to read as follows:

55.19-109 *Mandatory*. Shaft inspection and repair work in vertical shafts shall be performed from substantial platforms equipped with bonnets or equivalent overhead protection.

13. New standard 55.19-129 is added to read as follows:

55.19-129 *Mandatory*. Hoistmen shall examine their hoists and shall test overtravel, deadman controls, position indicators, and braking mechanisms at the beginning of each shift.

[FR Doc.74-14976 Filed 6-28-74; 8:45 am]

PART 56—HEALTH AND SAFETY STANDARDS—SAND, GRAVEL, AND CRUSHED STONE OPERATIONS

Miscellaneous Amendments

Pursuant to the authority vested in the Secretary of the Interior under section 6 of the Federal Metal and Nonmetallic Mine Safety Act (30 U.S.C. 725) to develop, revise and promulgate health and safety standards for metal and nonmetal mines, there was published on Wednesday, August 29, 1973, a notice of proposed rulemaking in the FEDERAL REGISTER (38 FR 23384-23386), to amend Part 56, Subchapter N, Chapter I, Title 30, Code of Federal Regulations, by revising and revoking certain standards currently in force and by adding new standards. Each of the standards contained in the notice was developed or revised after consultation with the Federal Metal and Nonmetal Mine Safety Advisory Committee appointed pursuant to section 7 of the Act (30 U.S.C. 726).

The notice further provided that each proposed standard which is to be a mandatory standard was so designated by the word "Mandatory" which appeared at

the beginning of the standard and if a standard had been recommended by the Federal Metal and Nonmetal Mine Safety Advisory Committee, such standard was identified by the letters "MNMSAC." Under the provisions of subsection 6(e) of the Act (30 U.S.C. 725(e)) a standard recommended by the Advisory Committee was not subject to hearings.

Subject to the provisions of subsection 6(e) of the Act and in accordance with the provisions of subsection 6(d) (30 U.S.C. 725(d)) on or before the last day of the period fixed for the submission of written data, views, or arguments, any person who may be adversely affected by a proposed standard which had not been recommended by the Federal Metal and Nonmetal Mine Safety Advisory Committee was afforded an opportunity to file with the Secretary of the Interior written objections thereto stating the grounds for such objection and requesting a public hearing (subject to the Administrative Procedure Act) on such subject.

Interested persons were requested to submit written data, views, arguments and requests for hearings to the Administrator, Mining Enforcement and Safety Administration (MESA) on or before October 15, 1973. No hearings were requested on the proposed standards which were designated as "Mandatory" by the Secretary of the Interior, and all of the data, views and arguments received concerning the standards were given careful consideration.

The comments and recommendations received indicated support for the standards which are promulgated below. Promulgation of the proposed revision to standard 56.19-24 (38 FR 23386) concerning wire rope attachments has been deferred so that the Department may undertake additional review, study and analysis of such changes prior to taking further action with respect to this standard. Most of the comments received were in response to proposed health standard 56.5-1 (38 FR 23385). As a result of these comments the following changes are made:

Standard 56.5-1. (a) Editorial changes have been made in paragraphs (a) and (b) to clarify the requirements of these provisions; and

(b) The Threshold Limit Values published in the 1972 edition of the American Conference of Governmental Industrial Hygienists publication have been updated to the Conference's 1973 edition which supersedes and replaces the 1972 edition; and

(c) An 8-hour time weighted average exposure of personnel to airborne concentrations of asbestos dust has been specified in paragraph (b); and

(d) The term "asbestos" as used in paragraph (b) is defined to include only chrysotile, amosite, crocidolite, anthophyllite asbestos, tremolite asbestos, and actinolite asbestos, or those minerals which are essentially known as asbestos minerals. The latter three minerals use the word asbestos because the same mineral name is used for both the asbestiform and non-asbestiform varieties

Johns-Manville

Talc Labeling
Internal Correspondence

To: Filtration and Minerals
Environmental Committee Members*

Date: June 21, 1974

From: Harry R. Keefe

Copies: Listed Next Page

Subject: Talc Labeling

*E. M. Fenner	W. B. Reitze	G. Swallow
R. P. Carter	S. W. Schulmeyer	R. S. Lamar
W. A. Cooper	F. J. Solon, Jr.	
D. E. Hillier	W. C. Streib	
T. M. Jackson, Jr.	R. B. VonWald	
R. W. McIndoe	Paul Kotin, M.D.	



Attached is the tentative letter we will send to our talc customers over my signature advising them that we will label all plant shipments effective September 1, 1974. Please review to prevent any erroneous statements. I particularly call your attention to the third paragraph. It is my understanding from tests run by Environmental Control Department that these statements are correct. I request that W. B. Reitze and D. Hillier/G. Swallow comment.

The label itself has been modified, removing the "% fibrous tremolite" and changing the wording of this paragraph.

Many of you in your comments to my June 12, 1974 letter questioned our timing. Our plan and the reasons are as follows:

Customers will be contacted by letter during the month of July informing them of our September 1, 1974 labeling schedule. Some customers will be contacted personally.

It is necessary to give some customers 30 days or more time to formulate us out and find and receive a suitable substitute. If we were to label immediately, we could have customer plant shutdowns in various locations due to employees' refusal to handle or customers' refusal to accept material and consequently have no alternate raw material.

CRMC-MAD-000716

Environmental Committee Members

Page 2

June 21, 1974

Considering our plan to have Penhorwood on stream in mid '75 with a tremolite-free talc, these same asbestos concerned customers would be potentials for Penhorwood talc. We would not like to leave them with a bitter taste for J-M by a hasty labeling action.


Harry R. Keefe

HRK:ccr

Attachment

cc: C. J. Sulewski
W. L. VanDerbeek
P. A. Martinson
H. Kranich
N. B. Scheffel
G. Coombs
R. G. Riede
K. R. Comann
D/C

CRMC-MAD-000717

**Johns-Manville
Products Corporation**

Filtration & Minerals Division

Greenwood Plaza
Denver, Colorado 80217
(303) 770-1000

Gentlemen:

Never in the history of American industry has so much emphasis (and rightly so) been placed on employee safety. The voluntary and required installation of dust control equipment is testimony to this statement. There is no good that will come from the inhalation of any dust. Dust must be controlled. To emphasize this point, all bags of Desert Minerals talc will be labeled with a caution notice effective September 1, 1974.

Our California talcs contain varying percentages of tremolite, a crystalline mineral which mineralogically has been defined as an amphibole of asbestos. Due to this, it is our opinion the bags should contain an asbestos caution. Since the major percentage of the mineral in the bag is talc, we have also included on the label a caution notice concerning the inhalation of talc dust.

OSHA regulations require the control of talc dust to 20 MPPCF. If the talc is controlled to this level, our tests have shown you will also meet the OSHA asbestos standards. ?

Below is a sample of the label which will appear on our bags:

CAUTION

**CONTAINS ASBESTOS FIBER
AVOID CREATING DUST.
BREATHING ASBESTOS FIBER MAY
CAUSE SERIOUS BODILY HARM.**

This commercial talc product contains fibrous Tremolite, which has been classified by OSHA as an asbestiform mineral. Adequate dust control as is currently required by OSHA mineral dust standards is recommended to bring this product into compliance with OSHA's standard for exposure to asbestos dust.

CRMC-MAD-000718

CAUTION

PROLONGED EXPOSURE TO EXCESSIVE
QUANTITIES OF TALC DUST ALONE CAN
BE INJURIOUS TO HEALTH. AVOID
CREATING AND BREATHING TALC DUST.
RESPIRATORS OR DUST MASKS APPROVED
BY NIOSH OR THE BUREAU OF MINES ARE RECOMMENDED.

We feel the labeling of our product, as with all products
which could cause a dust condition, is in the best interest
of you and your employees.

Should you have any questions, please do not hesitate to
contact me directly.

Sincerely yours,

Harry R. Keefe
Vice-President and General
Marketing Manager, Minerals

HRK:ccr



Johns-Manville

Talc Labeling
Internal Correspondence

To: H. R. Keefe - 2W/2

Date: June 13, 1974

From: D. E. Hillier - 4N/3

Copies: Paul Kotin, M.D.
E. M. Fenner

R. P. Carter
F. J. Solon, Jr.

~~W. D. R. 100~~
File & Chrono

Subject: TALC LABELING
YOUR LETTER JUNE 12

In accordance with your request, I would like to comment with regards to the proposed label.

I would use the word "approximately" instead of "maximum" and would change other words per the following rewrite:

This commercial talc product may contain approximately _____% fibrous Tremolite, which has been classified by O.S.H.A. as an asbestiform mineral. Under normal conditions of usage, with adequate dust control as required by O.S.H.A. mineral dust standards, the use of this product will comply with O.S.H.A.'s standard for exposure to asbestos dust.

I suggest the elimination of the first sentence under the second caution label. Following is a rewrite:

Avoid creating and breathing talc dust. Respirators or dust masks approved by N.I.O.S.H. or the Bureau of Mines are recommended.

D. E. Hillier

CRMC-MAD-000720



Johns-Manville

Talc
Internal Correspondence

To: W. B. Reitze - 4N

Date: July 23, 1975

From: V. E. Wolkodoff - R&D

Copies: J. P. Leineweber - R&D
E. M. Fenner - 4N

Subject:

1. As of 4:30 P.M. yesterday, I have to change Windsor Talc from containing 10 percent by weight of chrysotile to one of not containing any deleterious asbestos minerals except for background count fibers found at 20,000X by scanning electron microscopy (SEM).
2. I am personally and fully responsible for this error and please accept my apology for any embarrassment and any type of inconvenience this may have caused you.
3. For matter of record, the Windsor Talc is composed predominantly of talc with appreciable amounts of the serpentine mineral group, dolomite, magnesite, two types of chlorite and trace amounts of biotite and magnetite.

The serpentine minefal group refers to one or more of the following minerals: chrysotile, antigorite, and lizardite. All these have the same chemical formula but differ in morphology.

4. Our initial findings were based on clean and sharp peaks by X-ray diffraction and optical observations on hammered raw material which is exceptionally coarse grained. At that time we did not realize that two types of chlorite were present, since only one type is usually present in talc, and these two types of chlorite evidently have a pronounced effect on chrysotile diffraction peaks. Also, the hammered and flattened platelets of talc had many of the optical characteristics of chrysotile including indices of refraction which is the first time this has happened to me. Literally speaking, we have examined several hundred talc samples and have always been able to differentiate chrysotile from talc which is notorious for mimicking chrysotile fibers.
5. The correct analytical approach for the determination of chrysotile or amphibole asbestos is to run routine X-ray diffraction, conduct cursory petrographic examination and then go to the most important method which is transmission

CRMC-MAD-000721

W. B. Reitze

-2-

July 23, 1975

electron microscopy (TEM) and check each fiber by a selected area diffraction pattern (SAED). Our TEM is quite old but satisfactory for some problems; however, it does not have modern SAED capabilities which are essential for accurate determination of minerals especially the family of asbestos fibers.

6. If we had SAED capabilities the erroneous results would not have been reported.
7. Again, please accept my apology.

V. E. Wolkodoff
V. E. Wolkodoff

sm

Notebook: 4533, p 88

CRMC-MAD-000722



FILE COPY *file*

Internal Correspondence

To: J. P. LEINEWEBER - R&D

Date: JULY 18, 1975

From: W. B. REITZE - 4N

Copies: E. M. FENNER; V. E. WOLKODOFF

Subject: TALC ANALYSIS

SEVERAL MONTHS AGO WE RECEIVED THE ATTACHED CORRESPONDENCE FROM WINDSOR TALC, OUR SUPPLIER OF TALC AT THE WAUKEGAN PLANT. AS YOU CAN SEE, THEY ATTACHED A LETTER FROM THE ILLINOIS EPA WHICH STATES THAT THE TALC IN QUESTION DOES NOT CONTAIN ANY ASBESTOS. IN ORDER TO DETERMINE WHETHER THIS WAS CORRECT, I HAD FRANK ANGELOS, OUR INDUSTRIAL HYGIENIST AT WAUKEGAN, BREAK OPEN A NEW BAG OF THE WINDSOR MATERIAL, OBTAIN A SAMPLE, AND I SENT IT ALONG AS THE ATTACHED CORRESPONDENCE INDICATES. THERE SEEMS TO BE SOME DIFFERENCE OF OPINION BETWEEN THE ILLINOIS EPA, MCCRONE ASSOCIATES, AND OUR OWN RESEARCH.

JIM, DO YOU HAVE ANY IDEA AS TO WHO IS RIGHT AND WHY?

WBR

W. B. REITZE

ATTACH.

CRMC-MAD-000723



Johns-Manville

Internal Correspondence

To: W. B. Reitze - 4N

Date: July 10, 1975

From: V. E. Wolkodoff - R&D

Copies: E. M. Fenner - 4N
J. P. Leineweber - R&D

Subject: ANALYSIS OF TALC FROM W. B. REITZE, SUBMITTED
JUNE 30, 1975. LOCALITY AND MANUFACTURER ARE
UNKNOWN.

The predominant constituent is Talc with subordinate amounts of akermanite and chrysotile asbestos fiber. Chrysotile constitutes between 10 and 15 percent of the sample by volume. Akermanite is a complex silicate, but is a non-asbestos mineral.

V. E. Wolkodoff
V. E. Wolkodoff

sm

*L-
get cover on this*

CRMC-MAD-000724



Johns-Manville

FILED COPY

Talc

Internal Correspondence

To: J. LEINEWEBER - R&D

Date: JUNE 30, 1975

From: W. B. REITZE -- 4N

Copies: E. M. FENNER

Subject: SAMPLE OF TALC

ATTACHED IS A SAMPLE OF TALC USED IN ONE OF OUR PLANTS.

WOULD IT BE POSSIBLE FOR YOU TO RUN THIS THROUGH ANALYSIS AND DETERMINE, (1) IF THERE IS ANY ASBESTOS FIBER PRESENT, (2) HOW MUCH FIBER IS PRESENT, (3) WHETHER THE FIBER IS CHRYSOTILE, TREMOLITE, OR ANTHOPHYLLITE.

IF YOU NEED IT, YOU ALREADY HAVE OUR CHARGE NUMBER.

W. B. REITZE

ATTACH.

CRMC-MAD-000725



Johns-Manville

Internal Correspondence

To: W. H. Gates - Denver 5S

Date: April 22, 1975

From: C. R. Wikel/L. D. Mutaw *CRW*

Copies: See below:

Subject: TALC VS ASBESTOS

There has always been some question as to asbestos found in Talc.

For your information we are enclosing copies of a letter from Roger N. Miller, President of Windsor Minerals Inc. and Martin J. Sheahan, Illinois E.P.A.

cc:

W. B. Reitze - Denver 4N

J. N. Siegfried - Denver 4N

P. J. Niccolai - 44

F. J. Angelos - 3

H 3.3

CRMC-MAD-000726



WINDSOR MINERALS INC.

P.O. Box 680 Windsor, Vermont 05089

April 16, 1975

Johns-Manville Products Corp.
Waukegan,
Illinois 60085

Attn: Mr. Peter Nicoli
Roofing Supt.

Dear Mr. Nicoli:

I am attaching a letter from The Illinois Environmental Protection Agency which I believe will be of interest to you and should be in your files.

This was a difficult situation to resolve and the regulations need amendment but we are glad to be able to provide you with this assurance of quality.

We thank you for your confidence in, and use of our product.

Yours very truly,

WINDSOR MINERALS INC.

Roger N. Miller
President

RNM:rg
Enc. EPA Letter

CRMC-MAD-000727

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

2200 Churchill Road
62706



Springfield, Illinois
Phone: (312) 793-4966

Reply to:

Dr. Richard H. Briceland, Director

April 10, 1975

Environmental Protection Agency
Div. of Air Pollution Control
Naval Armory
East Randolph at the Lake
Chicago, Illinois 60602

Windsor Minerals Company
P. O. Box 680
Windsor, Vermont 05089

Attn: Mr. Roger Miller-President

Dear Mr. Miller:

As you know the State of Illinois E.P.A. has collected samples of talc in many manufacturing plants during the last year. These samples would be routinely forwarded to our laboratory with a request to analyze the samples for asbestos.

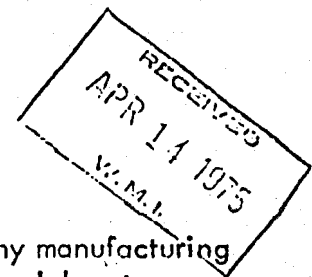
Three of the Windsor talc samples, collected from local roofing material plants, were reported as definitely containing a form of asbestos. At this time the E. P. A. did not have an electron scanning microscope and had to rely on the electron microscope work of the University of Illinois.

During a series of telephone calls to our local office you seriously objected to these findings and it was decided to have a meeting in Chicago to resolve the issue.

During the meeting Ian Stewart of Walter C. McCrone Associates, Inc., presented clear and logical reasons why talc can be mistaken for asbestos. It was then decided to resolve the issue by taking two random samples from local plants and presenting a portion of each sample to McCrone and our laboratory. In this way any discrepancy in the results could be resolved between the respective technicians and hopefully a uniform opinion would result.

As you know McCrone was prompt in reporting their results. Our own results were delayed pending the final installation and debugging of the E.P. A.'s new electron microscope.

We would like to report that both laboratories have found no asbestos in the random talc samples. We would also like to express our regrets to you and your customers for any inconvenience which our initial findings may have caused. I am sure you know that we were proceeding in good faith and did not have good reason to doubt the original findings of our laboratory and the University of Illinois.



CRMC-MAD-000728

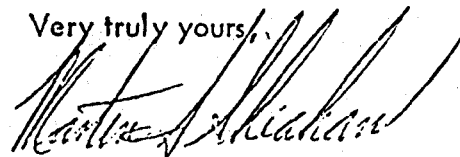
100% recycled paper

April 10, 1975
Page II
Windsor Minerals Company

We do intend to continue random sampling of talc in this region. At this point in time we feel that our laboratory does have the capability to do this work and problems such as the one enumerated above will not occur in the future.

If you have any further questions on this matter, please feel free to contact our Chicago Office.

Very truly yours,



Martin J. Sheahan
Sub-Unit Supervisor

MJS:ek

cc: Fry Roofing Company - Mr. D. Foster
Flintkote - Mr. J. Butera
Certain - Teed - Mr. W. J. Neville

CRMC-MAD-000729



Johns-Manville

Internal Correspondence

uw
Talk

To: George Swallow - 4 North

Date: February 21, 1975

From: H. Kranich

Copies: H. R. Keefe, Paul Kotin-4N-W. Reitze-4N-C

Subject: DESERTALC - CUSTOMER HELP

George, I'd like to express thanks and appreciation for the real help given us on several recent occasions - in your arranging really rapid customer work station visits to Desertalc major accounts.

Ben Hanson of Mineral Ceramic Products personally told me how valuable your help was and what a pleasure it was these days to have a supplier react fast and follow through!

I'm sure we have built some same bridges with Solo Cup with such equally quick response these past few days. These efforts are really helping.


H. Kranich

CRMC-MAD-000730

To: Labeling Review Committee*

Date: April 11, 1975

From: E. M. Fenner - 4N

Copies: File & C

Subject: TALC

*Paul Kotin, M.D. - 4N
M. J. Cowan - 1W
J. P. Leineweber - R&D
A. C. Finkbiner - 5W
W. B. Reitze - 4N ✓
R. F. Sliker - 1W
G. W. Wright, M.D. - 4N

Paul Kotin has asked me to circulate to you for your information the attached two letters that he received from William E. Smith, M.D., Director, Health Research Institute, Fairleigh Dickinson University.

E. M. Fenner

EMF:jh
Attach.

Fairleigh Dickinson University

RUTHERFORD TEANECK MADISON

31 March 1975

FLORHAM-MADISON CAMPUS

285 Madison Avenue

Madison, New Jersey

Area Code 201
377-4700

Paul Kotin, M.D.
Vice President for Health
Johns-Manville Corporation
P.O. Box 5108
Denver, Colorado 80217

Dear Paul:

Enjoyed our conversation in New York.

I talked on Saturday with Dr. Hildick-Smith at Johnson & Johnson and learned of two papers that may be of interest to you. He says these papers are to be presented on the afternoon of Tuesday, April 15, at the American Industrial Health Conference at the San Francisco Hilton.

One is by Dr. Fine from Harvard, who apparently will suggest that the TLV for talc should be lowered because he finds impairment in the pulmonary function tests in a group of workers exposed to "talc" in the rubber industry. Hildick-Smith says that less the 50% of this material was talc, that 55% was magnesium carbonate.

The other paper is by Prof. Rubino from Turin. It was not submitted in time to be listed in the printed program. I understand that Prof. Rubino will say that he finds no excess mortality and no difference in incidence of cancer in about 1200 deceased talc miners in Pinerola (Italy) as compared to a comparable number of deceased agricultural workers who lived nearby. I gather that the Pinerola mine is one of the largest and oldest talc mines in Europe.

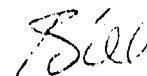
Information on the conference is available from:

Howard N. Schultz
Executive Director
American Occupational Medicine Association
150 N. Wacker Drive
Chicago, Ill. 60606
(Telephone 312 782-2166)

WES/elc

cc: Dr. J.P. Leineweber
George Wright, M.D.

Sincerely,



William E. Smith, M.D.
Director
Health Research Institute

CRMC-MAD-000732

Fairleigh Dickinson University

RUTHERFORD TEANECK MADISON

31 March 1975

Dr. Raymond E. Shapiro
Epidemiology Unit, HFF-108
Bureau of Foods
Food & Drug Administration
200 C Street South West
Washington, D.C. 20204

FLORHAM-MADISON CAMPUS

285 Madison Avenue
Madison, New Jersey

Area Code 201
377-4703

Dear Ray:

Further to our conversations about talc, this is to mention a paper that I understand will be presented on the afternoon of Tuesday, April 15 at the American Industrial Health Conference at the San Francisco Hilton.

This paper is by Prof. Rubino from Turin. It was not submitted in time to be listed in the printed program.

I understand that Prof. Rubino will report that he finds no excess mortality and no difference in incidence of cancer in about 1200 deceased talc miners in Pinerola (Italy) as compared to a comparable number of deceased agricultural workers who lived nearby. I gather that the Pinerola mine is one of the largest and oldest talc mines in Europe.

Information on the conference is available from:

Howard N. Schultz
Executive Director
American Occupational Medicine Association
150 N. Wacker Drive
Chicago, Ill. 60606
(Telephone 312 782-2166)

Sincerely,



William E. Smith, M.D.
Director
Health Research Institute

WES/elc

CRMC-MAD-000733



Johns-Manville

Talc
Internal Correspondence

To: Filtration & Minerals Environmental
Committee*

Date: Dec. 2, 1974

From: E. M. Fenner

Copies: P. Kotin, M.D.
J. D. McGrath
File & C

Subject: OSHA DIRECTIVE - TREMOLITE AND TALC

*R. P. Carter
W. A. Cooper
A. C. F. Finkbiner III
D. E. Hillier
T. M. Jackson, Jr.
H. R. Keefe

R. W. McIndoe
✓ W. B. Reitze
S. W. Schulmeyer
F. J. Solon, Jr.
W. C. Straib
G. W. Wright, M.D.

Attached for your information is a copy of OSHA Field
Memorandum #74-92, subject - tremolite and talc.

Attach.

CRMC-MAD-000734

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
WASHINGTON, D.C. 20210



November 21, 1974

FIELD INFORMATION MEMORANDUM #74-92

TO: OSHA Assistant Regional Directors and Area Directors

SUBJECT: Tremolite and Talc

1. Background:

The attached letter from Assistant Secretary of Labor John H. Stender gives further policy guidelines in regard to tremolite and talc that are not asbestiform or fibrous.

2. Policy Change:

In order to be considered asbestiform or fibrous the following criteria will be used by the Salt Lake City Laboratory of OSHA:

- A. Particles must appear to be fibrous rather than as crystals or slivers.
- B. The maximum diameter of a fiber to be counted is 3 microns.
- C. The maximum length of a fiber to be counted is 30 microns.
- D. The length to width ratio must be 5 or more to 1, that is, 5 times or more longer than wide.
- E. The separate or individual fibers must contain fibrils or the "bundle of sticks" effect, unless they are at a non-divisible stage. A fibril cannot be subdivided and would be counted, if it meets the other criteria. The electron microscope may be used to prove the fibrous nature of the particles. The length to width ratio of 5 or more to 1 is not meant to imply that other particles are not hazardous.

3. Sample Collection and Submission:

If the Compliance Safety and Health Officer (CSHO) is reasonably sure that the talc or tremolite is fibrous or asbestiform, he will sample following the OSHA Sampling Data Sheet #2 for asbestos.

CRMC-MAD-000735

In all other cases for talc or tremolite, he will (1) sample following the Sampling Data Sheet #2 for asbestos and (2) sample using the midget impinger for non-asbestiform, non-fibrous talc or tremolite. When impinger samples are taken, an air sample must be collected following OSHA Sampling Data Sheet #3 for crystalline silica for determining the percent quartz at the Salt Lake City OSHA Laboratory.

Midget impinger samples must be analyzed within 24 hours after collection for the results to be valid. Therefore, arrangements must be made by the Industrial Hygienist with a local laboratory concerning the analyses prior to making the inspection. These samples are not to be sent to the OSHA Laboratory, Salt Lake City; they will not be analyzed there... If the Industrial Hygienist is certain that the talc or tremolite is asbestiform or fibrous, impinger samples may be omitted from the inspections.

4. Results and Interpretation

- (1) Results from the impinger samples will be used if the talc or tremolite is non-asbestiform or non-fibrous. Table G-3 of 1910.93 would apply. The Time Weighted Average (TWA) for talc or tremolite that is non-asbestiform, non-fibrous is 20 millions of particles per cubic foot of air by the light-field count method.
- (2) The laboratory will give two results for the talc or tremolite that is asbestiform or fibrous submitted for analyses of asbestos. One for definite asbestiform fibers meeting the criteria of 5 or more to 1 and one for those fibers meeting the older asbestos criteria, namely those particles having a length to width ratio of 3 or more to 1. Samples having a 5 or more to 1 length to width ratio and meeting the other criteria of paragraph #2 Policy Change would mean that fibrous or asbestiform talc or tremolite is present. Therefore, the standard for asbestos, 1910.93a, would apply.

This guidance is temporary and may change as a result of findings from an on-going NIOSH study on this subject.

- 3 -

Any questions may be directed to Mr. Charles McClure, Division of Occupational Health Programming, Occupational Safety and Health Administration, Washington, D. C. 20210, telephone 202-961-2726.

Richard P. Wilson

for

Barry J. White
Associate Assistant Secretary
for Regional Programs

Attachment

CRMC-MAD-000737

C O P Y

October 9, 1974

Mr. H. B. Vanderbilt
President
Chief Executive Officer
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 08855

Dear Mr. Vanderbilt:

This is in reply to your letter of September 26, concerning your request for relief from the asbestos standard for your talcs containing non-fibrous tremolite, actinolite, and anthophyllite. of h'

My letter of August 6 stated that non-fibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the asbestos standard and, therefore, the provisions of that standard do not apply to talc containing non-asbestiform minerals.

NIOSH is currently conducting a thorough investigation into the exact minerals to which talc workers were exposed in those studies where asbestosis or other adverse medical effects were found.

Pending the receipt and evaluation by OSHA of the report by NIOSH on this investigation, if you have scientific evidence that the naturally occurring talcs, prior to processing by milling or crushing, do not contain fibrous or asbestiform tremolite, antophyllite, actinolite or other asbestiform minerals, you may certify to your customers that the talc does not contain asbestos.

Fibrous, asbestiform minerals such as fibrous tremolite means naturally occurring asbestiform minerals which prior to or after crushing and processing, contain fibers made up of fibrils.

Sincerely,

/s/ John H. Stender

John H. Stender
Assistant Secretary of Labor

CRMC-MAD-000738

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
WASHINGTON, D.C. 20210

Nov 25 3 10 PM '74
OSHA
REGION VIII DENVER



November 21, 1974

FIELD INFORMATION MEMORANDUM #74-92

TO: OSHA Assistant Regional Directors and Area Directors

SUBJECT: Tremolite and Talc

1. Background:

The attached letter from Assistant Secretary of Labor John H. Stender gives further policy guidelines in regard to tremolite and talc that are not asbestiform or fibrous.

2. Policy Change:

In order to be considered asbestiform or fibrous the following criteria will be used by the Salt Lake City Laboratory of OSHA:

- A. Particles must appear to be fibrous rather than as crystals or slivers.
- B. The maximum diameter of a fiber to be counted is 3 microns.
- C. The maximum length of a fiber to be counted is 30 microns.
- D. The length to width ratio must be 5 or more to 1, that is, 5 times or more longer than wide.
- E. The separate or individual fibers must contain fibrils or the "bundle of sticks" effect, unless they are at a non-divisible stage. A fibril cannot be subdivided and would be counted, if it meets the other criteria. The electron microscope may be used to prove the fibrous nature of the particles. The length to width ratio of 5 or more to 1 is not meant to imply that other particles are not hazardous.

3. Sample Collection and Submission:

If the Compliance Safety and Health Officer (CSHO) is reasonably sure that the talc or tremolite is fibrous or asbestiform, he will sample following the OSHA Sampling Data Sheet #2 for asbestos.

CRMC-MAD-000739

In all other cases for talc or tremolite, he will (1) sample following the Sampling Data Sheet #2 for asbestos and (2) sample using the midget impinger for non-asbestiform, non-fibrous talc or tremolite. When impinger samples are taken, an air sample must be collected following OSHA Sampling Data Sheet #3 for crystalline silica for determining the percent quartz at the Salt Lake City OSHA Laboratory.

Midget impinger samples must be analyzed within 24 hours after collection for the results to be valid. Therefore, arrangements must be made by the Industrial Hygienist with a local laboratory concerning the analyses prior to making the inspection. These samples are not to be sent to the OSHA Laboratory, Salt Lake City; they will not be analyzed there.. If the Industrial Hygienist is certain that the talc or tremolite is asbestiform or fibrous, impinger samples may be omitted from the inspections.

4. Results and Interpretation

- (1) Results from the impinger samples will be used if the talc or tremolite is non-asbestiform or non-fibrous. Table G-3 of 1910.93 would apply. The Time Weighted Average (TWA) for talc or tremolite that is non-asbestiform, non-fibrous is 20 millions of particles per cubic foot of air by the light-field count method.
- (2) The laboratory will give two results for the talc or tremolite that is asbestiform or fibrous submitted for analyses of asbestos. One for definite asbestiform fibers meeting the criteria of 5 or more to 1 and one for those fibers meeting the older asbestos criteria, namely those particles having a length to width ratio of 3 or more to 1. Samples having a 5 or more to 1 length to width ratio and meeting the other criteria of paragraph #2 Policy Change would mean that fibrous or asbestiform talc or tremolite is present. Therefore, the standard for asbestos, 1910.93a, would apply.

This guidance is temporary and may change as a result of findings from an on-going NIOSH study on this subject.

- 3 -

Any questions may be directed to Mr. Charles McClure, Division of Occupational Health Programming, Occupational Safety and Health Administration, Washington, D. C. 20210, telephone 202-961-2726.

Richard P. Wilson

for

Barry J. White
Associate Assistant Secretary
for Regional Programs

Attachment

CRMC-MAD-000741

C O P Y

October 9, 1974

Mr. H. B. Vanderbilt
President
Chief Executive Officer
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 08855

Dear Mr. Vanderbilt:

This is in reply to your letter of September 26, concerning your request for relief from the asbestos standard for your talcs containing non-fibrous tremolite, actinolite, and anthophyllite. ^{of h'}

My letter of August 6 stated that non-fibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the asbestos standard and, therefore, the provisions of that standard do not apply to talc containing non-asbestiform minerals.

NIOSH is currently conducting a thorough investigation into the exact minerals to which talc workers were exposed in those studies where asbestosis or other adverse medical effects were found.

Pending the receipt and evaluation by OSHA of the report by NIOSH on this investigation, if you have scientific evidence that the naturally occurring talcs, prior to processing by milling or crushing, do not contain fibrous or asbestiform tremolite, antophyllite, actinolite or other asbestiform minerals, you may certify to your customers that the talc does not contain asbestos.

Fibrous, asbestiform minerals such as fibrous tremolite means naturally occurring asbestiform minerals which prior to or after crushing and processing, contain fibers made up of fibrils.

Sincerely,

/s/ John H. Stender

John H. Stender
Assistant Secretary of Labor

CRMC-MAD-000742

Johns-Manville

Internal Correspondence

To: W. A. Cooper - 4N

Date: January 24, 1974

From: R. S. Lamar

Copies: W. C. Streib - R&D
W. B. Reitze - LS

F. J. Solon - 4N
R. P. Carter - 4N

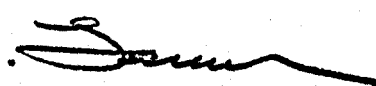
Subject: YOUR MEMO OF JANUARY 22, 1974

The J-M position with respect to the proposed FDA specification and test method has been outlined in detail in Richard Carter's letter of December 21, 1973 to the FDA. This is now a part of the public record and could be obtained by Mr. Lindesmith. On page 14 of Carter's letter he states that we believe the method to be unworkable. This has been confirmed by numerous other qualified people who have attempted to use the method. Numerous statements to this effect have been made to the FDA. These also are now a part of the public record and could be obtained by Mr. Lindesmith.

We most certainly agree with Mr. Lindesmith that the proposed method is "unbelievable" to say the least. However we have attempted in every possible way to be cooperative with the FDA and to be helpful where we believed our special knowledge or expertise might fit. In this spirit of cooperation we submitted as a part of Richard Carter's December 21, 1973 letter to the FDA a "Modified FDA Optical for Asbestos in Talc." This is our Report No. VW73-62, dated December 17, 1973 by V. E. Wolkodoff. A copy is attached.

Even this procedure is very difficult and time-consuming. It requires a highly trained petrographer. A full day is required for one sample. We do not fully understand what we have when we complete the test. What do the results mean? On what medical data has the FDA decided that the ingestion of asbestos is harmful? On what medical data has the FDA decided that chrysotile 10X more harmful than tremolite? How were the limits of 100 fibers for chrysotile and 1000 fibers for tremolite established?

It is important to remember at this point that this is still only a proposed test method and specification. Just how the FDA might ultimately rule remains to be determined. We know that there have been numerous and vehement responses to their proposal.

R. S. 

CRMC-MAD-000743

JOHN-SAMVILLE RESEARCH
AND ENGINEERING CENTER



Report No. VW73-62

Date December 17, 1973

FIGURE 1 MODIFIED FDA OPTICAL FOR ASBESTOS IN TALC

1. The method is essentially similar to the procedure as outlined by A. E. Schulze and W. V. Eisenberg of the U. S. Food and Drug Administration, Washington, D.C., August 20, 1973. Considerable experience is necessary to obtain a uniformly well-dispersed sample on the slide.
2. Equipment, etc.:
 - A. Leitz Orthoplan Petrographic Microscope.
 - B. Magnification 500X. Resolution is 0.4 micron. (1)
 - C. Diameter of field at 500X is 0.350 mm.
 - D. Area of the field at 500X is 0.096mm^2 .
 - E. Area of 100 fields (which are taken at random) is equal to 9.60mm^2 .
 - F. Use 18 x 18 mm square cover slip over 1 mg of sample. Area of the cover slip is 342mm^2 .
 - G. For each fiber detected in 100 fields, multiply by 34 for total number of fibers in 1 mg sample.
 - H. If the population of asbestos is heavy, only 5 to 10 fields are necessary for counting which is then extrapolated to the entire sample under the cover glass.
 - I. Use OSHA definition of fiber: 5 microns or greater in length and a length-to-width aspect ratio of at least 3:1.

(1) Note: 500X magnification is recommended rather than the approximately 400X of the original procedure in order to (a) assure Becke Line determination; and (b) field contains fewer particles and is less confusing.

It should be recognized that theoretically we could observe at 500X some fibers which might not be determined at 400X, thus resulting in a slightly higher "asbestos fiber count" than for the same sample observed at 400X.

3. From a petrographic viewpoint, we prefer to go immediately after "culprits" with appropriate index oils rather than the two-slide method as proposed by Schulze and Eisenberg

in which asbestos fibers are counted relative to talc indices of refraction. This method presents too many technical (optical) problems and can be misleading. For example, if sepiolite fibers are present, and using the FDA 1.574 liquid slide, these fibers have to be counted as chrysotile.

4. Be sure the material is essentially talc. Use liquid with n of 1.590 for confirmation and at same time look for apparent gross contamination.
5. The Becke Line is extremely difficult to interpret on fibrous-appearing talc. More often than not, there is disagreement among petrographers in the same laboratory on precisely the same fibrous-appearing talc particle as to whether the Becke Line is moving in or out. With experience, however, the talc particles standing on edge can readily be determined by the relatively high interference order color. Also, in an oil of 1.556 under plane polarized light, the particles will match the oil from an angle of approximately 45° to 80° , but never in the N-S or E-W directions.
6. If not present as large bundles, the most difficult asbestos mineral to determine is chrysotile. The gamma index (X-direction) we use is 1.556. Prepare 1 mg slide with 1.556 oil and proceed with determination. Under conditions of crossed Nicols and near maximum light intensity, proceed to look for chrysotile showing maximum interference color at 45° . Now check for parallel extinction. Switch to plane polarized light, reduce the light intensity and iris diaphragm for contrast and check the gamma index. If fiber is chrysotile, it will nearly disappear or show Christiansen effect for gamma index. Rotate the stage 90° to get relative bearing of Alpha index. The fiber should now stand out in high relief with Becke Line going into the oil. Then check for positive elongation.
7. The most common asbestiform amphibole to be associated with talc is tremolite. Prepare 1 mg slide with 1.622 oil (gamma index for tremolite) and proceed with determination (now, all non-tremolitic particles stand out in high relief). Go for tremolite's most characteristic feature which is inclined extinction of about 10° to 14° (gamma index to the Z direction). At position of extinction check for gamma index. If these match, rotate stage 90° to get relative reading of Alpha index which is below 1.622. Confirm tremolite with positive elongation.



8. If Step 7 indicates the presence of amphibole fibers other than tremolite by differences in extinction angle or index of refraction, then these can be determined by routine petrographic methods. Once species is established use same procedure as in (7) (1 mg of sample on slide in a characteristic oil of the mineral for counting purposes) giving due allowance for differences in extinction angle and elongation.

Reported by V. E. Wolkodoff
V. E. Wolkodoff

rr

Johns-Manville

Talcum
Internal Correspondence

To: R. S. Lamar - R&D

Date: October 9, 1974

From: V. E. Wolkodoff - R&D

Copies: Distribution at End of Memo

Subject: FDA OPTICAL METHODS FOR COUNTS OF ASBESTOS MINERALS MEETING
OSHA DEFINITION IN FOUR TALC SAMPLES PRODUCED BY R. T.
VANDERBILT COMPANY

1. Through J. P. Leineweber, R. P. Carter has requested that this memorandum listing asbestos fiber counts on four samples of talc from R. T. Vanderbilt Company (submitted by Charles Wagner Company) be on his desk on Friday, October 11, 1974.

2. The R. T. Vanderbilt Company talc samples are identified as follows:

1. Lab. No. RC-74255-1	Nytal 200
2. Lab. No. RC-74255-2	Nytal 400
3. Lab. No. RC-74255-3	Asbestine 3X
4. Lab. No. RC-74255-4	Asbestine 325

3. Since the samples are extremely complex due to types of asbestos being present, the J-M modified optical method could not be used for each determination but rather we had to use the FDA Microscopical Detection of Asbestos in Talc by Arnold E. Schulze and William V. Eisenberg issued on August 20, 1973. The J-M modified optical technique, however, was used on each samples (clarified Millipore membrane) in conjunction with Zernicke phase contrast microscopy as a check on the total number of fibers in each sample. In all tests only fibers meeting OSHA definition were counted; that is, at least a 3:1 aspect ratio and fiber lengths have to be at least 5 microns or longer.

4. Total number of asbestos fibers per mg in each sample:

a. Nytal 200	1,055,000 fibers/mg
b. Nytal 400	2,146,000 fibers/mg
c. Asbestine 3X	1,460,000 fibers/mg
d. Asbestine 325	1,526,000 fibers/mg

5. Fibers per mg of each asbestos component for the four

(2)

R. S. Lamar

October 9, 1974

samples studied are as follows:

SAMPLES	TREMOLITE	CHRYBOTILE	ANTHOPHYLLITE
Nytal 200	604,000/mg	300,000/mg	151,000/mg
Nytal 400	1,931,000/mg	86,000/mg	129,000/mg
Asbestine 3X	876,000/mg	561,000/mg	23,000/mg
Asbestine 325	992,000/mg	503,000/mg	31,000/mg

The predominant fiber in each sample is Tremolite which can be somewhat blocky, with clipped ends, is very harsh, but most are narrow and rigid fibers. The Chrysotile ranges from silky (very small percentage), bundles of few fibrils, and bundles containing numerous fibrils. In general, the Chrysotile is considered medium-harsh to harsh. The Anthophyllite is characterized by having very narrow diameters, being extremely rigid, being almost spear-like since individual fibers can show one end as acicular (needle-like) and others show a double termination of acicularity.

6. By transmission electron microscopy (TEM), six plates were taken of each sample. One print of each sample to show at least a few Chrysotile fibers are attached and the magnification is 11,000X. At this magnification 1.1 cm equals one micron.

The TEM plates on file are as follows:

- | | |
|------------------|-------------------------|
| a. Nytal 200 | TEM Plate Nos. 2301 A-F |
| b. Nytal 400 | TEM Plate Nos. 2302 A-F |
| c. Asbestine 3X | TEM Plate Nos. 2303 A-F |
| d. Asbestine 325 | TEM Plate Nos. 2304 A-F |

All plates were taken at 4400X, and after enlargement for prints, the magnification would be 11,000X.

All TEM plates were taken on our RCA EMU-3B electron microscope. We had planned to use a better model, Philips 200, at The Denver Research Institute for greater

CRMC-MAD-000748

R. S. Lamar

October 9, 1974

clarity, better resolution, obtain plates at higher magnification and do selected area electron diffraction to prove the identity of the asbestos minerals (which cannot be done on our RCA model), but the instrument at DRI was not available for our use at the time; and in all probability even if available, the work could not have been finished by October 11, 1974, since the optical work took a great deal of time.

7. If better TEM micrographs are needed with selected area electron diffraction patterns for your FDA presentation, and if you somehow can get additional time before the presentation, I will make arrangements for our use of the Philips 200 electron microscope at DRI.

V. E. Wolkodoff

V. E. Wolkodoff
Applied Research Section

jc

Distribution:

R. P. Carter	- 4N	F. L. Pundsack
E. M. Fenner	- 4N	J. P. Leineweber
Paul Kotin, M.D.	- 4N	W. C. Streib
W. B. Reitze	- 4N	A. J. McArthur
F. J. Solon, Jr.	- 4N	S. Speil
G. L. Swallow	- 4N	
A. C. F. Finkbiner, III	- 5W	
J. A. McKinney	- 5W	
H. R. Keefe	- 2W	
P. A. Martinson	- 2W	
C. J. Sulewski	- 2W	
W. L. VanDerbeek	- 2S	
R. G. Riede	- 2S	



1. TEM Nytal 200, RC 74255-1

CRMC-MAD-000750

EM-2301D

11,000X



2. TEM Nyal 400, PC 74255-2

CRMC-MAD-000751

EM2302C

11,000X



TEM Asbestine 3X, RC 74255-1

CRMC-MAD-000752

EM-2303D

11,000X



4. TEM Asbestine 325, RC 74255-4

CRMC-MAD-000753

EM-2304A

11,000X

JM Johns-Manville

Internal Correspondence *15*

To: P. Kotin, M.D., F. J. Solon, E. M. Fennel Date: October 17, 1974
W. B. Reitze, G. L. Swallow

From: R. P. Carter

Copies: File and C.

Subject: Tremolitic Talc - Asbestos Standard -
Letter from U.S. Department of Labor
to R. T. Vanderbilt Company

Here is a copy of John Stender's October 9
letter to R. T. Vanderbilt Company.

RP Carter

RPC:jp
Enclosure

CRMC-MAD-000754

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
WASHINGTON, D.C. 20210



Office of the Assistant Secretary

OCT 9 1974

Mr. H. B. Vanderbilt
President
Chief Executive Officer
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 08855

Dear Mr. Vanderbilt:

This is in reply to your letter of September 26, concerning your request for relief from the asbestos standard for your talcs containing non-fibrous tremolite, actinolite, and anthophyllite.

My letter of August 6 stated that non-fibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the asbestos standard and, therefore, the provisions of that standard do not apply to talc containing non-asbestiform minerals.

NIOSH is currently conducting a thorough investigation into the exact minerals to which talc workers were exposed in those studies where asbestosis or other adverse medical effects were found.

Pending the receipt and evaluation by OSHA of the report by NIOSH on this investigation, if you have scientific evidence that the naturally occurring talcs, prior to processing by milling or crushing, do not contain fibrous or asbestiform tremolite, anthophyllite, actinolite or other asbestiform minerals, you may certify to your customers that the talc does not contain asbestos.

Fibrous, asbestiform minerals such as fibrous tremolite means naturally occurring asbestiform minerals which prior to or after crushing and processing, contain fibers made up of fibrils.

Sincerely,

A handwritten signature in cursive script, reading "John H. Stender", is written over the typed name.

John H. Stender
Assistant Secretary of Labor



Johns-Manville

Talc
Internal Correspondence

To: See Below*

Date: September 30, 1974

From: R. P. Carter

Copies: File and Chrono

Subject: FDA REGULATIONS ON THE USE OF TALC

*J. S. Autry
H. R. Keefe
P. Kotin
R. R. Lamar
E. M. Fenner
J. P. Leineweber
P. A. Martinson
G. E. Parker

F. L. Pundsack
W. B. Reitze
N. B. Scheffle
F. J. Solon
W. C. Streib
C. J. Sulewski
W. L. VanDerbeek
R. R. Zazenski

In my memo of September 13, 1974, I indicated that during a meeting with FDA officials on September 12, we agreed to conduct additional tests to determine the lowest level of detectability of tremolite in food. The FDA requested these additional tests in an effort to quantify our conclusion that tremolite does not migrate from food packaging paper containing tremolitic talc. Enclosed for your information is a copy of a letter dated September 27 from Jim Leineweber and Rich Zazenski to Dr. Corbin Miles of FDA reporting the results of our latest tests.

I have been advised that a final draft of FDA's position paper on talc will be forwarded this week to the General Counsel's Office of FDA, with our latest test data included. I have been further advised that the position paper will indicate that FDA is withdrawing its proposed restriction of the use of talc containing asbestos in food and drug packaging materials, based on J-M's migration studies. At the present time, it is not possible to estimate when FDA will publish its position paper on talc in the Federal Register. The document may be published as soon as next month if no complications are encountered during the internal FDA review procedure.

Plante

CRMC-MAD-000756

September 27, 1974

Dr. Corbin Miles (HFF-335)
Food & Drug Administration
200 C Street, S.W.
Washington, D.C. 20204

Dear Corbin:

At our last meeting with you on September 12, 1974, you raised a question regarding the limits of detectability of tremolite in various food samples. The main reason for your question was to be able to specify a reasonable lower limit to 0 fiber counts.

In order to answer your question, we agreed to perform the following three tests:

1. Determine the limit of detectability of tremolite in salt spiked with tremolitic talc.
2. Determine the limit of detectability of tremolite in meat spiked with tremolitic talc.
3. Determine the limit of detectability of tremolite in salt spiked with ash from paper manufactured with tremolitic talc.

The details of the experiments are attached. All of the counting was done by the optical microscope at 500X magnification. The samples were prepared by filtering on a 47 mm diameter, 0.2 micrometer millipore filter. The maximum amount of total material which can be deposited on this filter is 0.5 mg. Any greater concentrations result in too great a probability of fibers being hidden behind other particles.

The results that we have obtained indicate that tremolite can be detected at a level of about 20 ppm in any residue. The detectability in any foodstuff will, therefore, depend upon the amount of ash remaining when the food is ignited.

Dr. Corbin Miles, FDA
Washington, D.C.

September 27, 1974
Page 2

As an example, if a food yields 1 per cent ash, then the limit of detectability of tremolite in the food would be 200 parts per billion. In the case of the spiked salt, the limit of detectability is about 0.1 parts per billion.

We hope that this information has answered your questions. If we can be of any further assistance, please do not hesitate to contact either Rich Zazenski or myself.

As you requested, under separate cover we are also sending several paper samples made with various amounts of tremolitic talc.

Very truly yours,

Dr. James P. Leineweber
Manager, Applied Research

Richard J. Zazenski
Research Engineer

rs

Attachment

bcc:
Dr. P. Kotin - 4N
Att: F. J. Solon
R. P. Carter - 4N
W. C. Streib - R&D
R. S. Lamar - R&D
J. P. Leineweber - R&D
Att: S. Speil
R. J. Zazenski - R&D

CRMC-MAD-000758

Attachment

Dr. Corbin Miles, FDA

SUPPLEMENTARY FDA WORK

Item I: 150 gm of meat was spiked with 0.0060 gm of F-1 talc standard (0.25 per cent tremolite). This produced the equivalent of 100 ppb trem/meat. Based on the original fiber count of 41,000 tremolitic fibers/mg of F-1 standard, there were approximately 246,000 fibers contained in the ash. The 150 gm of meat ashed down to 1.25 gm. For petrographic slide preparation, 0.5 mg of this ash was dispersed on a 47 mm millipore filter. Assuming a homogeneous mix of ash and fibers, there should have been approximately 98 tremolite fibers deposited on the millipore filter. Optical examination observed 70.

Item II: 250 gm of salt was spiked with 0.1 mg of F-1 standard. In the 0.1 mg of talc, there were approximately 4,100 fibers. This corresponds to 1 ppb tremolite/salt. The salt was completely dissolved and filtered through a 0.2 μ millipore filter. If no fibers were lost during the procedure, all of the 4,100 fibers should have been collected on the filter. Optical examination observed 4,200 tremolite fibers on one sample and 3,450 fibers on another.

Item III: A paper containing 3 per cent CYCLO-FIL talc was ashed and prepared for tremolite fiber count. The count was 390,770 $\pm$ 30 per cent tremolite fibers per mg/ash.

Then 0.1 mg of this paper ash was mixed with 250 gm of salt and the procedure for the recovery of insolubles was performed. If no fibers were lost during preparation, there should have been approximately 39,000 fibers collected on the filter. Optical examination revealed 35,000.

Item IV: 400 gm of salt was spiked with 16 micrograms of F-1 standard. This introduced approximately 656 tremolite fibers into the salt. This corresponds to approximately 0.1 ppb trem./salt. The salt was dissolved and filtered through 0.2 millipore. Optical examination observed 290 fibers.

CRMC-MAD-000759

9-27-74

CRMC-MAD-000760



Johns-Manville

Internal Correspondence

To: N. B. Scheffel - 2 West

Date: October 2, 1974

From: G. L. Swallow - 4 North

Copies: T. E. Remmers - 2 West
E. M. Fenner - 4 North
D. R. Christensen - R&D

F. J. Angelos - Waukegan
~~W. B. Reitze - 4 North~~
M. A. Baloga - 4 North

B/U - 10/14/74
File
Chron

Subject: PAPER MILL TALC USAGE
SPECIAL ENVIRONMENTAL SAMPLE

This is to outline plans and action to date resulting from yesterday's meeting with you, Tom Remmers, Ed Fenner, and me.

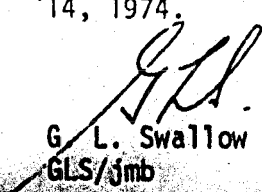
It was agreed that testing should be done in several paper mills in order to determine the level of asbestiform dust generated in the use of various Johns-Manville talcs. The first priority is to be the Howard Paper Company of Dayton, Ohio. Second priority is the Northwest Paper Company of Pomona, California. Other plants mentioned were Flambeau Paper Company in Park Falls, Wisconsin, and Weyerhaeuser Paper Mills.

Based upon our telephone conversation of yesterday afternoon, we plan our sampling at Howard Paper Company to include:

1. An ambient air sample in the warehouse adjacent to talc storage.
2. An ambient air sample in the hydropulper area, while not using talc.
3. An ambient air sample in the hydropulper area, while using talc.
4. A personal sample on the Fork Lift Truck Operator as he transports talc from the warehouse to the hydropulper area.
5. A personal sample on the Hydropulper Operator while talc is not being used.
6. A personal sample on the Hydropulper Operator while talc is being used.
7. If a rail shipment is in the plant during our visit, we will also monitor the unloading of the car.

Frank Angelos, Supervisor of the Central Industrial Hygiene Laboratory, has discussed details with Jerry Timmin and has arranged to arrive by automobile in Dayton on Monday evening, October 7th. He will spend all of Tuesday at the Howard Paper Company; sampling Tuesday morning for conditions when talc is not being used, and Tuesday afternoon for conditions when talc is being used.

Provided all arrangements are satisfactorily met, we expect to have preliminary information for you not later than early in the week of October 14, 1974.


G. L. Swallow
GLS/jmb

CRMC-MAD-000761



Johns-Manville

Talc *WMC*
Internal Correspondence

To: CELITE ENVIRONMENTAL
COMMITTEE MEMBERS

Date: August 2, 1973

From: E. M. Fenner

Copies: File & C

Subject: ACGIH DOCUMENTATION FOR TALC THRESHOLD LIMIT VALUES

*R. P. Carter	E. F. Marriner, M.D.
E. M. Fenner	W. B. Reitze
D. E. Hillier	F. J. Solon, Jr.
T. M. Jackson	W. C. Streib
H. R. Keefe	G. W. Wright, M.D.

In the action minutes of the last Celite Environmental Committee meeting, held Tuesday, July 17, 1973, I was given the assignment of again rewriting the ACGIH Documentation of Threshold Limit Values for Talc in accordance with recommendations made by committee members during the meeting.

The assignment also included distribution of the revised documentation to committee members for review before it is sent to Dr. Stokinger, Chairman of the TLV Committee, ACGIH. The rewritten copy is attached.

Emf

E. M. Fenner

EMF/emr

Attachs.

CRMC-MAD-000762

DRAFT

August 2, 1973

PROPOSED REWRITE OF DOCUMENTATION FOR TALC - ACGIH

COMMERCIAL TALC (non-asbestiform)

Although the term talc in its mineralogic sense refers to a specific substance, a hydrous magnesium silicate, it is applied commercially to a variety of products with similar physical properties. Some of these contain only a small talc component. Accessory minerals commonly found are tremolite, serpentine, anthophyllite, magnesite, dolomite, calcite, diopside, chlorite, and quartz. Pyrophyllite has similar uses and is often grouped with talc in commercial statistics. Only talc containing tremolite has been definitely associated with diffuse pulmonary fibrosis, similar to asbestosis.

The TLV of 20 mppcf is based largely on the work of Dreessen and DallaValle (1), who studied 66 individuals who had been exposed to dust in two mills and mines handling Georgia steatite talc (soapstone) with 10% tremolite content; they found no pneumoconiosis in those who worked at an average dust concentration of 17 mppcf, but severe and disabling cases were detected in groups working at average dust concentrations of 135 and 300 mppcf.

The TLV for talc containing asbestiform minerals is based on the fiber count. For talc without identifiable asbestiform minerals a TLV of 20 mppcf, based on the light-field dust count, is recommended. In some cases it may be desirable to make both dust and fiber counts, if the fiber content is variable or unknown.

- - - - -

1. Dreessen, W.C., DallaValle, S.M.: Pub. Health Repts. 50, 131 (1935)

CRMC-MAD-000763

DRAFT

August 2, 1973

PROPOSED REWRITE OF DOCUMENTATION FOR TALC - ACGIH

COMMERCIAL TALC (containing Asbestiform Minerals)

The pure talc mineral, which is platey or micaceous, normally is found in nature combined with a number of other minerals which may include the asbestiform minerals: tremolite, chrysotile and anthophyllite. In a number of environmental and clinical studies of workers exposed to talc dusts, talc containing asbestiform minerals has been shown to be of greater physiological significance than talc which does not contain identifiable asbestiform minerals. A proper evaluation of the mineral dust hazard requires a differentiation in the Threshold Limit Values for the asbestiform mineral containing and non-containing forms.

Porro, Patton and Hobbs (1), on the basis of 15 cases with five post-mortem examinations, reported that asbestos bodies were almost invariably present in the fibrotic areas in cases of talcosis and noted a degree of similarity between asbestosis and pneumoconiosis due to talc. Siegel and associates (2) found an advanced fibrosis incidence rate of 14.5 % in a study covering 221 miners and millers of talc containing tremolite. The dust to which these workers were exposed was largely fibrous and this physical characteristic was considered to be responsible for the pathology of the lung lesion, particularly because of its resemblance to asbestosis. Findings by McLaughlin and co-workers (3) indicated that talc pneumoconiosis could be caused only by

the varieties of talc that contain asbestiform minerals. In post-mortem examinations on eight talc industry workers, Schepers and Durkan (4) found histological features which suggested that tremolite was the main pathogenic agent in provoking the characteristic talc lung lesion. In studying the effects of talc dust on animal tissue, the same authors (5) found that the degree to which the fibrosis supervenes depends on the length of the fibers rather than on their chemical composition. Kleinfeld et al (6) reported post-mortem findings on six talc industry workers in which the bodies found in respiratory bronchioles or imbedded in fibrous tissues were indistinguishable from asbestos bodies as seen in asbestosis.

Because of the striking similarity in the fibrotic reaction caused by asbestos fibers, and that produced by talc containing asbestiform minerals, the suggested Threshold Limit of 5 fibers exceeding 5 microns in length per milliliter of air is recommended for talc containing identifiable asbestiform minerals.

- - -

1. Poro, F.W., Patton, J. R., Hobbs, A.A.: Am. J. Roentgenol. 47 507 (1942).
2. Siegal, W., Smith, A. R., Greenburg, L.: Am. J. Roentgenol. 49 11 (1943).
3. McLaughlin, A.I.G., Rogers, E., Dunham, K.C.: Brit. J. Ind. Med. 6, 184 (1949).
4. Schepers, G.W.H., Durkan, T.M.: Arch. Ind. Health, 12, 182 (1955).
5. Ibid.: 12, 317 (1955)
6. Kleinfeld, M., Giel, C.P. Majeranowski, S.F., Messite, J.: Arch. Env. Health 7, 101 (1963).

To: M. A. Baloga - 4N

Date: July 22, 1974 *file*

From: R. K. Comann - 4S

Copies: W. L. VanDerbeek, R. G. Riede, D. E. Hillier, G. L. Swallow,
W. B. Reitz - File, ChronoSubject: SEMI-ANNUAL INDUSTRIAL HYGIENE SURVEY - TALC PLANTS
RE: YOUR LETTER JUNE 18, 1974

As you know, our most recent survey sited a number of stations at our Los Angeles Plant as being over the TLV of 10.0 or 2.0 F/CC for talc dust. Based on this survey we are taking immediate steps to correct the situation so as to be in compliance with the 1972 OSHA Standards mentioned in your June 18 letter. However, in Mr. F. J. Solon's letter of July 15, 1974, there is an Environmental Affairs Checklist which states the following:

No. 11. MESA Talc Standard

MESA has announced that it is planning a joint study with NIOSH to determine the toxicity of Talc and Tremolite dust exposure. Until the study is completed the threshold limit values (TLV) published in the 1973 edition of the American Conference of Governmental Industrial Hygienists (ACGIH) will be used to measure and regulate talc exposure. MESA officials have determined, as a result of the May 1973 Public Talc Symposium, that Talc and Termolite exposure are not as hazardous as Chrysotile or other true asbestos minerals. Thus, a revised Talc standard can wait until the joint study is finished...probably several years.

What does this mean to us? Are we still going to be required to reduce our in-plant Talc dust to 10.0 or 2.0 F/CC? Since we are planning some rather expensive appropriations very soon to correct our dust problems, it is essential that we know what standards we are going to be required to meet.

Please advise right away.

R. K. Comann *RK*



Johns-Manville

Internal Correspondence

To: E. M. Fenner
R. P. Carter

Date: August 28, 1974

From: G. L. Swallow

Copies: F. J. Solon, Jr.
W. B. Reitze
File & Chron

Subject: CONVERSATION WITH HOWARD J. SCHULTE/OSHA, AND RAY McCLURE/OSHA
REFERENCE: JOHN STENDER'S LETTER OF AUGUST 6, 1974, TO
MR. H. B. VANDERBILT, R.T. VANDERBILT CO., INC.

In response to your request, I called Howard Schulte and discussed with him the subject letter. He was obviously entirely familiar with it.

Mr. Schulte stated that the whole interpretation of the letter hinges upon the definition of "asbestiform" and "non-asbestiform".

In response to my question as to what was the current definition of asbestiform, or differentiation between asbestiform and non-asbestiform, he stated that the definition is the same as previously used in conjunction with the asbestos regulations, specifically that the aspect ratio be 3:1 or greater, and that the length be greater than 5 microns. He amplified his definition by saying that if a talc sample were examined under a microscope and more than 5 artifacts/cc were counted, which fit this definition, it would be termed a violation of the OSHA regulations. When I pressed him concerning the difference between artifacts and tremolite, he stated that, "We cannot take tremolite from the standard at this time." He further stated that OSHA technicians have never seen artifacts which fit the above definition which they consider to be non-tremolitic.

He stated that NIOSH is currently studying the possibility that there do exist non-tremolitic "slivers" which should be differentiated from the tremolitic fibers and which, because they are (perhaps) not a health hazard, should not be counted when evaluating a talc sample. However, the results of this study are one to two years off.

In answer to my query, he stated that the Vanderbilt Company argued the above point, namely that such "slivers" do exist and that it is inaccurate and unfair to include them in any fiber counts associated with talc sampling. He went on to say that despite Vanderbilt's arguments, OSHA was not going along with this concept, unless and until the NIOSH study mentioned above confirmed it.

As our conversation drew to a close, Mr. Schulte suggested that since I had asked so many detailed and technical questions, it would be well for me to talk to Ray McClure. He told me that he would have Ray call me later today.

CRMC-MAD-000767

E. M. Fenner/R. P. Carter
August 28, 1974
Page Two

Later this morning, Ray McClure called and referred to my conversation with Howard Schulte.

He started by explaining that the Vanderbilt mining operations are under the jurisdiction of MESA, not OSHA. Their concern with the OSHA regulations is because of their customers who have read the asbestos regulations and are worried about being cited in their plant operations because of possible tremolitic content in the talc.

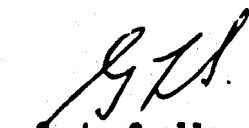
Mr. McClure said that John Stender's letter of August 6, 1974, was an attempt to give some relief for this situation, but doubted that it did so very effectively.

He stated that he was presently urging certain modifications to the standard as presently written. His recommendations are to NIOSH, and must be approved by NIOSH before they can be seriously considered or promulgated. In answer to my question as to what specifically he was recommending, he cautioned me to realize that these were wholly tentative and stated that they were:

1. Revise the aspect ratio in the fiber definition (as associated with talc) from 3:1 to 5:1. He noted that such a recommendation would be contingent upon NIOSH opinion regarding the health aspect.
2. Do not count any fibers whose diameter is greater than 5 microns.
3. Require that the microscopist attempt to make positive identification of fibers as being asbestos particularly by means of observing the fiber end configuration.

He stated that the Salt Lake City laboratory consists chiefly of OSHA people, now, and that the microscopists already attempt to differentiate between true tremolitic fibers and other non-fibrous artifacts which would be classified as fibers if judged only by aspect ratio and length. (Please note the discrepancy between this note and Howard Schulte's)

Mr. McClure stated that if the above changes are successfully promulgated, the standard will probably require sampling by the "asbestos technique" and by impinger. Whether or not a given station is over TLV will be judged by whichever criterion is stricter. OSHA is also considering requiring high volume air samples to permit chemical or mineralogical analysis of the airborne dust.


G. L. Swallow
GLS/jmb

CRMC-MAD-000768

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
WASHINGTON, D.C. 20210



Office of the Assistant Secretary

August 6, 1974

Mr. H. B. Vanderbilt
President
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 06855

Dear Mr. Vanderbilt:

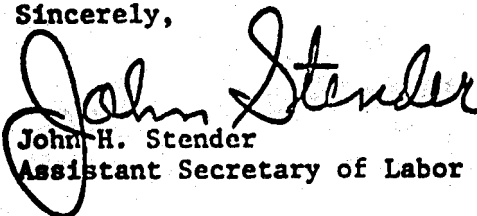
Your request for an interpretation of the asbestos standard, section 1910.93a, as it related to tremolite talc has been given deep consideration.

The following interpretation of the standard, 1910.93a, is collectively the opinions of both the Occupational Safety and Health Administration and the National Institute for Occupational Safety and Health.

The present asbestos standard is written for the purpose of controlling exposures to the fibrous or asbestiform minerals commonly considered to be asbestos. This is reflected in the established permissible limit for asbestos air contamination to which a worker may be exposed. This is expressed in terms of numbers of fibers in excess of a prescribed length per unit of volume. The required method of determination or analysis is also expressed as a method for counting fibers.

Therefore, nonfibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the existing standard. Talc containing only non-asbestiform tremolite is not regulated by the standard 1910.93a. For emphasis, if only talc and non-fibrous tremolite are present, there is no violation of the asbestos standard. Talc containing asbestiform tremolite or other fibrous asbestos minerals will be regulated by the standard 1910.93a.

Sincerely,


John H. Stender
Assistant Secretary of Labor

CRMC-MAD-000769



Johns-Manville

Talc
Internal Correspondence

To: R. Reide

Date: July 17, 1974

From: W. B. Reitze

Copies: R. P. Carter, H. Keefe, W. VanDerbeek, Dr. P. Kotin

Subject: POSSIBLE CHANGE IN TREMOLITIC TALC REGULATIONS

On Monday, July 15 I spoke with Mr. Howard Shulte, Deputy Director, OSHA, regarding recent developments in the regulations of tremolite.

Mr. Shulte informed me that after hearing the presentation by the R. T. Vanderbilt Company on the differences between fibrous talc and platey talc, OSHA had agreed to travel to New York state, obtain samples of the Vanderbilt talc, and have the laboratory people at Salt Lake City analyze them.

If, after consultation with NIOSH on the results of the analysis, they find that the situation is as reported by Vanderbilt, they will in turn grant Vanderbilt a variance from compliance with the published asbestos regulations. If this variance is granted, they obviously would be under obligation to go through the same procedure for all other talc producers.

OSHA has no intention of changing the asbestos regulations to exclude tremolite from the definition of asbestos. Howard Shulte further stated that their scientific people were not overly optimistic about arriving at a conclusion that tremolitic talc was free of fibrous material.

This procedure is estimated to take in excess of 30 days, and the results will probably be announced around the first of September.

WBR
W. B. Reitze

WBR/lc

CRMC-MAD-000770

DM

Johns-Manville

Greenwood Plaza
Denver, Colorado 80217
(303) 770-1000

Talc file

June 11, 1974

Professor William A. Burgess
Dept. of Environmental Health Science
Harvard School of Public Health
665 Huntington Avenue
Boston, Mass. 02115

Dear Bill:

I have finally had an opportunity to speak to some of our research people regarding our discussion on the NIOSH study you are doing with the Vermont talc miners. Our research people would be only too happy to meet with you and show you what they have done to date regarding identification of fibrous talc and platey talc. It is my understanding that they have done work with the light microscope, the transmission electron microscope, as well as the scanning electron microscope.

I would suggest that you contact William C. Streib at our Research Center, P.O. Box 5108, Denver, Colorado 80217. He and his people would be happy to sit down and talk with you at our Research Center and show you our facilities at the same time.

With the vacation schedule coming along, it looks like this would have to be some time in mid-July. Perhaps you could contact Bill directly and let me know if you can get out this way for the visit.

With best regards,

Bill

W. B. Reitze
Manager, Accident Prevention
and Industrial Health

WBR/lc

cc: W. C. Streib - R&D

CRMC-MAD-000771



Johns-Manville

Internal Correspondence

To: W. C. Streib - R&D

Date: May 21, 1974

From: W. B. Reitze - GHQ

Copies: F. J. Solon, Dr. G. Wright, H. R. Keefe

Subject: TALC AND HEALTH - YOUR MEMO

At the recent AIHA Meeting in Maimi, I discussed this contract with Bill Burgess, who is the recipient for Harvard University. I do not feel that we will have any problem obtaining information. We may be asked to furnish some methodology to assist Bill in his work.

WBR
W. B. Reitze

WBR/lc

CRMC-MAD-000772



Johns-Manville

Internal Correspondence

To: F. J. Solon - 4N

Date: May 1, 1974

From: W. C. Streib - R&D

Copies: Dr. G. Wright - 3W
H. R. Keefe - 2W

W. B. Reitze - 1S ✓

Subject: TALC AND HEALTH

I just noted in the April 16 issue of COMMERCE BUSINESS DAILY (U.S. Department of Commerce) that NIOSH is negotiating with Harvard University School of Public Health for a study to ascertain whether Vermont talc is non-fibrous and to determine the safe level of exposure to this dust.

I'm just passing this along in the event that some Committee member might have contacts at Harvard who could supply us with details.



W. C. STREIB

rs

CRMC-MAD-000773

TAIC LABELING

CRMC-MAD-000774



Johns-Manville

Talc Labeling
Internal Correspondence

To: See below*

Date: November 7, 1974

From: Paul Kotin, M.D., 4N

Copies: F. J. Solon, Jr.
✓ R. Carter

Subject: TALC LABELING

*W. R. Goodwin, 5W
F. H. May, Jr., 5W
J. A. McKinney, 5W

F. L. Pundsack, R&D
C. J. Sulewski, 2W
W. L. VanDerbeek, 2S

We have been informed by Mr. Robert Bacon, Assistant to the President of R. T. Vanderbilt Company (a major talc competitor) that J-M's decision to insert asbestos caution labels on all talc shipments will result in "irreparable damage" to Vanderbilt. Mr. Bacon requested that this matter be brought to the attention of the highest level of management, and he stated that he was asking Mr. Hugh Vanderbilt, President of R. T. Vanderbilt, to call a senior officer at J-M to voice their concern and their belief that it is J-M's intention to hurt their company.

The purpose of this memorandum is to alert you to the situation in the event you are contacted by Mr. Vanderbilt. Our decision to label talc was based on our conviction that J-M's talc contains fibrous asbestos and in no way reflects any intention to hurt or destroy the Vanderbilt Company. If you would like additional details on this matter, please call me.

CRMC-MAD-000775



Johns-Manville

Internal Correspondence

make copy for PK 9-20-74
Talc Labeling
Date: September 20, 1974

To: F. J. Solon and
Filtration and Minerals
Environmental Committee

From: H. R. Keefe

Copies: P. A. Martinson, R. K. Comann, H. Kranich, N. B. Scheffel,
T. E. Remmers, D/C

Subject: Talc Label

Attached is the talc label which will appear on our talc products bag. Please advise the print and size of this label as required by OSHA.

H. R. Keefe
H. R. Keefe

HBK:ccr

Attachment

To: R. P. Carter
W. A. Cooper
E. M. Fenner
A. C. F. Finkbiner III
D. E. Hillier
T. M. Jackson, Jr.

R. W. McIndoe
W. B. Reitze ✓
S. W. Schulmeyer
F. J. Solon, Jr.
W. C. Streib
G. W. Wright, M.D.

CRMC-MAD-000776

CAUTION

**CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST.
BREATHING ASBESTOS DUST MAY CAUSE
SERIOUS BODILY HARM.**

This commercial talc product contains fibrous tremolite, which has been classified by OSHA as an asbestiform mineral. Compliance with OSHA standards and regulations for exposure to asbestos and compliance with any state and local standards which may exist is required.

CAUTION

**PROLONGED EXPOSURE TO EXCESSIVE
QUANTITIES OF TALC DUST ALONE MAY
BE INJURIOUS TO HEALTH. AVOID
CREATING AND BREATHING TALC DUST.
RESPIRATORS OR DUST MASKS APPROVED
BY NIOSH OR THE BUREAU OF MINES
ARE RECOMMENDED.**



Johns-Manville

Talc Labeling Labeling
Internal Correspondence

To: Labeling Review Committee*

Date: Oct. 15, 1974

From: E. M. Fenner - 4N

Copies: F. J. Solon, Jr.
H. R. Keefe - 2W
H. Kranich - 2W
File & C

Subject: LABELING REVIEW COMMITTEE MEETING
OCTOBER 15, 1974
REVIEW OF TALC LABEL

The proposed talc label was reviewed and decisions made as follows:

- (1) Printed label (Attachment 1) will be used for the label to be placed either by means of rubber stamp or gummed label on the existing supply of bags. The plant will arrange to have a series of rubber stamps made of varying type sizes to determine the optimum size for proper legibility.
- (2) The printed label to be put on future bags will be identical to the gummed label except that the word caution will be printed in larger, bolder type. (See Attachment 2).

*P. Kotin, M.D. - 4N
M. J. Cowan - 1W
A. C. F. Finkbiner III - 5W
✓W. B. Reitze - 4N
J. P. Leineweber - R&D

CRMC-MAD-000778

ATTACHMENT 1

CAUTION

**CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
BREATHING ASBESTOS DUST MAY CAUSE
SERIOUS BODILY HARM**

This commercial talc product contains fibrous tremolite, which has been classified by OSHA as an asbestiform mineral. Compliance with OSHA standards and regulations for exposure to asbestos and compliance with any state and local standards which may exist is required.

Prolonged exposure to excessive quantities of talc dust alone may be injurious to health. Avoid creating and breathing talc dust. Respirators or dust masks approved by NIOSH or The Bureau of Mines are recommended.

ATTACHMENT 2

CAUTION

**CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
BREATHING ASBESTOS DUST MAY CAUSE
SERIOUS BODILY HARM**

This commercial talc product contains fibrous tremolite, which has been classified by OSHA as an asbestiform mineral. Compliance with OSHA standards and regulations for exposure to asbestos and compliance with any state and local standards which may exist is required.

Prolonged exposure to excessive quantities of talc dust alone may be injurious to health. Avoid creating and breathing talc dust. Respirators or dust masks approved by NIOSH or The Bureau of Mines are recommended.

CRMC-MAD-000780

To: Labeling Review Committee*

Date: October 15, 1974

From: E. M. Fenner - 4N *EMF*

Copies: F. J. Solon, Jr.
File & C

Subject: LABELING REVIEW COMMITTEE MEETING
OCTOBER 15, 1974
GENERAL DISCUSSION

In our discussion today, the Committee decided it was necessary to review the present status of product labeling in the Company. Therefore, the following action items were assigned:

- (1) Check to determine if a master list of all warning labels presently in use is available - (M. J. COWAN)
- (2) Prepare an inventory of all present warning labels - (E. M. FENNER)
- (3) Check information obtained from (1) and (2) above against updated product dictionary when it is issued - (E. M. FENNER)
- (4) Review former labeling procedures bulletin as issued by the Senior Vice President for Research & Development to determine if duties set forth in the bulletin should be included in the activities of the Labeling Review Committee - (E. M. FENNER)
- (5) Check John Fischer (International) on products manufactured and sold abroad - (M. J. COWAN)

It was decided that the Committee would meet at regular intervals but not at any specific date or time. Meetings to be called as needed when suggested by E. M. Fenner and agreed to by P. Kotin, M.D.

*P. Kotin, M.D.
A. C. F. Finkbiner III
M. J. Cowan - 1W
✓ W. B. Reitze - 4N
J. P. Leineweber - R&D

CRMC-MAD-000781

Label *Talc Labeling*

Mr. H. B. Vanderbilt

Dear Mr. Vanderbilt:

This is in reply to your letter of September 26, concerning your request for release from the Asbestos Standard of minerals containing non-fibrous tremolite, actinolite and anthophyllite.

My letter of August 6 stated that non-fibrous or non-asbestiform minerals such as asbestiform tremolite are not within the scope of the Asbestos Standard and therefore the provisions of that Standard do not apply to talc containing non asbestiform minerals.

NIOSH is currently conducting a thorough investigation into the exact minerals to which talc workers were exposed in those studies where asbestosis or other adverse medical effects were found.

Pending the receipt and evaluation by OSHA of the report by NIOSH on this investigation, if you have scientific evidence that the naturally occurring talcs, prior to processing by milling or crushing, do not contain fibrous or asbestiform tremolite, actinolite, anthophyllite or other asbestiform minerals, you may certify to your customers that the talc does not contain asbestos.

Fibrous, asbestiform minerals, such as fibrous tremolite means naturally occurring asbestiform minerals which prior to or after crushing and processing contain fibers made up of fibrils.

Sincerely,

John Stender



Johns-Manville

Talc Labeling
Internal Correspondence

To: Labeling Review Committee*

Date: Oct. 14, 1974

From: E. M. Fenner - 4N *gms*

Copies: File & C

Subject: LABELING REVIEW COMMITTEE MEETING
TUESDAY, OCT. 14, 1974
9:00 A.M. - 4 North Conference Room

A meeting of the Labeling Review Committee is scheduled for 9:00 A.M., Tuesday, Oct. 15, in the Conference Room 4 North.

Attached is a copy of the proposed talc label to be discussed at this meeting.

Attach.

*P. Kotin, M.D. - 4N
M.J. Cowan - 1W
A. C. F. Finkbiner III - 5W
W. B. Reitze - 4N ✓

CRMC-MAD-000783

Changes
suggested
Friday

Center top part →

Fill out lines →

CAUTION

CONTAINS ASBESTOS FIBERS.
AVOID CREATING DUST.
BREATHING ASBESTOS DUST MAY CAUSE
SERIOUS BODILY HARM.

This commercial talc product contains fibrous tremolite, which has been classified by OSHA as an asbestiform mineral. Compliance with OSHA standards and regulations for exposure to asbestos and compliance with any state and local standards which may exist is required.

Prolonged exposure to excessive
quantities of talc dust alone may →

be injurious to health. Avoid
creating and breathing talc dust. →

Respirators or dust masks approved
by NIOSH or The Bureau of Mines
are recommended.

2 more

You'll get 2 new settings from Roger Slicker

One w/ top centered - one as is - both w/ bottom filled out.

Johns-Manville

Internal Correspondence

To: H. R. Keefe - 2 West

Date: June 24, 1974

From: G. L. Swallow - 4 North

Copies: See Below

Subject: TALC LABELING
YOUR LETTER OF JUNE 21, 1974

In answer to your request, I am commenting with regard to your paragraph number 3 which states, "OSHA regulations require the control of talc dust to 20 MPPCF. If the talc is controlled to this level, our tests have shown you will also meet the OSHA asbestos standards".

Unfortunately, our corporate survey results from both the Los Angeles Talc plant and the Dunn Talc mill do not confirm this statement. At the Los Angeles plant in July 1973, we took simultaneous impinger and membrane filter samples. In order for your statement to be correct, it would be necessary for the impinger counts expressed in MPPCF, to exceed the membrane filter counts expressed in F/cc, by at least a factor of 4. A few typical pairs actually run as follows:

<u>Station #</u>	<u>Survey Results - MPPCF</u>	<u>Survey Results - F/cc</u>
D-1M	36.4	40.2
D-2M	32.2	12.0
D-3M	41.4	59.0
D-8M	8.6	4.6

Similarly, at Dunn, typical results were:

<u>Station #</u>	<u>Survey Results - MPPCF</u>	<u>Survey Results - F/cc</u>
D-1M	2.4	3.3
D-4M	13.1	11.2
D-5M	9.1	10.5

We are enclosing the All Stations List in order that you may see the total picture as it exists based upon the Los Angeles plant surveys of 1972 and 1973, and the Dunn Talc mill survey of 1973.

G. L. Swallow
GLS/jmb

cc: R. P. Carter - 4 North
W. A. Cooper - 4 North
E. M. Fenner - 4 North
D. E. Hillier - 4 North
T. M. Jackson, Jr. - 2 West
P. Kotin, M.D. - 4 North
R. S. Lamar - R&D

R. W. McIndoe - 2 West
~~W. B. Reitze - 4 North~~
S. W. Schulmeyer - 2 West
F. J. Solon, Jr. - 4 North
W. C. Streib - R&D
R. B. VonWald - 5 West

CRMC-MAD-000785

Johns-Manville

Labeling
Internal Correspondence

To: H. R. Keefe

Date: June 20, 1974

From: W. B. Reitze

Copies: F. J. Solon

Subject: TALC LABELING

The attached comments relative to the June 5 hearings may have some bearing on just how soon the OSHA people will look into the talc industry's compliance with labeling regulations. My guess is that now that Bob Bacon has revealed the talc industry's stand on an official basis, the OSHA people will proceed immediately to check all talc operations for asbestos compliance.

This is most certainly another good argument for getting the labels on the bags as soon as possible.

WBR
W. B. Reitze

WBR/lc

Attach.

CRMC-MAD-000786

restaurant must serve 1,351 \$2 lunches for a single \$100 accident. A department store must sell \$128 pairs of boys' socks in order to make up the loss from a \$100 accident.

Small businessmen should remember that they are small, Stender said. "This means that the loss of even a single employee, whether its from a short-time illness or injury, or the permanent loss from death, is a real disaster. By their very nature, most small businesses rely on their employees for a wide variety of duties. Their larger counterparts have many highly-specialized employees, and it is relatively easy to fill the gap."

OSHA is not embarked on any sort of attack against retail establishments, Stender said. Of the nearly 60,000 inspections OSHA conducted since last July, only about 2,700 or less than 5 percent were in retail establishments.

Washington

OSHA RECEIVES NO PUBLIC COMMENTS ON WASHINGTON PLAN PROPOSED CHANGES

No public comments were received by the Occupational Safety and Health Administration and no internal OSHA adverse comments were generated concerning Washington's enabling legislation which was submitted to OSHA as a proposed supplement to the state plan, an OSHA spokesman told OSHR.

Comments were requested by OSHA up to May 29 regarding the issue of whether the supplement conforms with the state's assurances as set out in the state's proposed bill submitted as part of the state plan (Current Report, May 2, p. 1525).

A final OSHA decision approving the supplement will appear in a future Federal Register notice, the spokesman said.

Asbestos

TALC INDUSTRY CHALLENGES ASBESTOS STANDARD DEFINITIONS OF ASBESTOS, FIBER

The definitions of asbestos and asbestos fiber were challenged by Robert C. Bacon, assistant to the president, R. T. Vanderbilt Company, St. Lawrence County, N.Y., at a hearing held by the National Institute for Occupational Safety and Health in Rockville, Md., on June 5.

The hearing concerned proposed standards for occupational exposure to asbestos in surface coal mines and surface work areas of underground coal mines proposed on November 7, 1972.

According to Bacon, tremolite, anthophyllite, and actinolite have been historically categorized as asbestos. He maintains that this categorizing is "scientifically erroneous" because there is no medical evidence showing that these minerals are hazardous.

On a representative of the talc industry, suggested that the definition of asbestos should be changed to

...non-fibrous forms of tremolite, anthophyllite, and actinolite. These forms of asbestos are common to the talc industry.

Bacon said also that the definition of asbestos fiber "is unreal and skirts any nature of the definition of a fiber" (Reference File p. 31:5304). He proposed that the definition of fiber is itself crucial to the standard.

Robert L. Vines, vice president, Bituminous Coal Operators Association, opposed the proposed amendment to the asbestos standard as unnecessary. Bill Thurber, board member, Asbestos Information Association, commented that the proposed five fiber per cubic centimeter amendment is too strict.

Dr. Loren Kerr, director, occupational health, United Mine Workers of America, opposed the five fiber limit as too high. He said that the threshold limit concept itself is a hazard to workers.

Sheldon Samuels, director, health, safety, and environmental affairs, Industrial Union Department, AFL-CIO, agreed with the UMW stand. He called for a "no measurable amount of asbestos" standard, stating that asbestos application should be enclosed and well-ventilated, and that asbestos counting equipment should be checked and logged each week.

The hearing was chaired by Dr. Raymond T. Moore, associate director of the National Institute for Occupational Safety and Health.

General Policy

GIDEL URGES INSURANCE INDUSTRY TO ASSIST CLIENTS IN SAFETY CONTROL

A \$1,000 fine from the Government forcing an employer to control a hazardous condition may save the employer from more costly action later, Robert Gidel, Occupational Safety and Health Consulting Associates, Inc., told the American Insurance Association Administrative Engineers at a June 10 conference in Boca Raton, Fla.

Gidel advised that the least an employer should worry about is a visit by an Occupational Safety and Health Administration inspector. He said they should concern themselves about legal actions that may be brought by an injured employee, new job standards which can outlaw or force complete redesign of operating processes and procedures, new technical standards which will outlaw or force the complete redesign or retrofitting of machines and equipment, and health standards which may outlaw the use of certain materials or require such costly control measures that the same effect results.

Gidel urged employers to voluntarily comply with safety standards since OSHA cannot inspect every business establishment under its jurisdiction. To aid and advise employers, Gidel called upon the insurance industry to interpret the "vaguely comprehensible" format of OSHA standards and to further suggest to employers ways to alleviate hazardous conditions.

CRMC-MAD-000787

JM Johns-Manville

T. J. Fenner
Internal Correspondence

To: H. R. Keefe - 2W

Date: June 18, 1974

From: E. M. Fenner - 4N

Copies: P. Kotin, M.D.
R. P. Carter
F. J. Solon, Jr.

W. B. Reitze
R. B. VonWald
File & C

Subject: TALC LABELING
YOUR LETTER OF JUNE 12, 1974

My suggested label for your desert talc products is:

CAUTION

**CONTAINS ASBESTOS FIBER
AVOID CREATING DUST
BREATHING ASBESTOS FIBER MAY
CAUSE SERIOUS BODILY HARM.**

This commercial talc product may contain fibrous tremolite, which has been classified by OSHA as an asbestiform mineral.

If excessive dust is created, use respirators approved by NIOSH or the Bureau of Mines for protection against pneumoconiosis producing dusts.

CRMC-MAD-000788



Johns-Manville

Asbestos *un*
Internal Correspondence

To: P. Kotin, M.D.
G. W. Wright, M.D.
H. L. Olson

J. S. Autry
G. R. Chase
E. M. Fenner
~~W. J. Fenner~~

Date: December 22, 1976

From: R. P. Carter

Copies:

Subject: FEDERAL GOVERNMENT ACTIVITIES RELATING TO ASBESTOS

Approximately twice a year, EPA's Office of Toxic Substances prepares a list of federal government activities related to asbestos. The last such list was prepared and circulated in June 1976.

Attached is a draft of an updated asbestos activities list prepared by the Office of Toxic Substances. This list is presently under review and is likely to be expanded and published sometime next month.

Rick
R. P. Carter

/jh

CRMC-MAD-000789

HEALTH EFFECTS

*3/1
mitchell
ORD*
DRAFT

Carcinogenicity

A study of the carcinogenicity of various fiber types to rat or hamster was begun in October, and is expected to continue for three years.

This study hopes to help determine if asbestos is carcinogenic via the oral route, a question which needs a clear answer and which is obviously, important in regulation.

The problem in starting the project was acquiring about 1000 lbs. of fibers of definite type. Robert Tardiff, ORD, 8-684-7213, (513) 684-7213.

Cellular Transformations

The cultured cells of the hamster colon are being used to evaluate cellular transformation caused by asbestiform fibers. This project has been going on for about ten months, and should continue for approximately another two years. Robert Tardiff, ORD, 8-684-7213, (513) 684-7213.

Mutagenesis

Mammalian cells in culture are being used for an in vitro evaluation of mutagenicity of asbestos. Work was begun six months ago and should be completed in another 2 1/2 years. Robert Tardiff, ORD, 8-684-7213, (513) 684-7213.

Effects of Mine Samples

Samples of amphiball fiber from the Mitchell Pit in Minnesota are being administered intratracheally to rats. Later these animals will be examined for carcinogenic and co-carcinogenic effects. The study was just begun and will run for several years.

The most unusual aspect of this project is that a detailed mineralogical study of the minerals used is involved. David Coffin, ORD, 8-629-2585.

Impact of A/C Pipe

"Practically all" the communities in Connecticut have been screened via the tumor registry for cancer incidence. An attempt was made to correlate this with the use of asbestos/cement pipe or other kinds of pipe in the community water supply. A final report is being prepared. Gunther Crawn, ORD, 8-684-7218, (513) 684-7218.

California Epidemiology Study

Five counties in California are being surveyed to determine if there is a correlation between cancer and asbestos drinking water contamination. The study should be completed in 18 months. Lee McCabe, ORD, 8-684-7211, (513) 684-7211.

CRMC-MAD-000790

DRAFT

Duluth Epidemiology Study

A feasibility study is being undertaken for an epidemiological study in the Duluth area (Reserve Mining). This is co-ordinated with OWS. Lee McCabe, 8-684-7211, (513) 684-7211.

Talc Facility

A detailed study has been undertaken in upstate New York to document environmental levels of asbestiform fibers near a talc facility and mortality and morbidity data on workers. The preliminary report on environmental levels is now in review. The mortality study should be completed May '77. John Dement, NIOSH, (513) 684-3191 with H.P. Richardson, MESA, (202) 235-8308.

Underground Mine Workers

The contract has just been let for a 24 month study of health effects and environmental levels at the Homestake Gold Mine. All causes of death will be examined (respiratory cancer and other respiratory disease). Environmental work will commence in the spring. John Dement, NIOSH (513) 684-3255, 8-684-3255 with H.P. Richardson, MESA (202) 235-8307.

Effect on Toxicity Studies

Bioassay experiments to determine if the asbestos fiber content of Lake Superior water may affect the results of toxicity tests have been completed. Cadmium and Endium were used as typical toxic compounds. No dramatic effect was attributable to the contaminated water. A report is expected within six months. Philip Cook, ORD, (218) 727-6692, 8-782-9574.

Fiber Concentration in Tissue

A study is just beginning which will devise a method for detection and quantification of asbestos fibers in fish flesh. Natural fish from Lake Superior will be used. This will take approximately two years. Philip Cook, ORD, (218) 727-6692, 8-783-9594.

Tagged Fibers in Tissue

Amphibole fibers will be radioactively tagged. After exposure to water containing these fibers, fish will be sacrificed and sectioned. The sections will then be examined radioautographically for hot spots, as an indication of where the fibers travel within the fish. This project is just beginning and is expected to take one year. Philip Cook, ORD, (218) 727-6692, 8-783-9594.

CRMC-MAD-000791

DRAFT

Asbestos in Urine

(Possible project, still in thinking stage). Asbestos fibers have been found in the urine of residents of Duluth. This project would discover a reliable method for determination of these fibers in urine, as a possible monitoring technique. Philip Cook, ORD, (218) 727-6692, 8-783-9594.

Tagged Fibers/Intubation

Asbestos fibers with a high specific activity tritium label have been synthesized. (This is not a surface label that could separate from the fiber after ingestion.) These fibers will be given to rats via intubation. The animals' feces will then be monitored. Later, animals will be sacrificed and examined for location of any fibers remaining in the body. Since fiber size can be controlled, a comparison will be made of absorption of short versus long fibers. A pilot study has been completed. Fiber synthesis will begin next month; the animal work should follow a year later, after variability has been worked out of synthetic technique. Richard Bull, ORD, (513) 684-7418.

Effects of Synthetic Fibers

Using the synthetic technique mentioned above, "cold" (non-labeled) fibers will be made. They will be intraperitoneally injected into rats, and their carcinogenicity compared with that of natural fibers, similarly injected. Richard Bull, ORD (513) 684-7418.

CRMC-MAD-000792

Problem Identification

Sites of possible fiber concentration are being identified from geological maps. Air samples are then taken to see if a possible problem exists. Dr. Goodwin, MESA, 235-8307.

Runoff from Roads

Six sites are being selected for the identification and enumeration of asbestos fibers by type in road dust.

These sites are Milwaukee WI (two sites), Harrisburg PA, Nashville TN, Denver CO and Baton Rouge LA -- chosen for geographic distribution and highway design. First analyses have been done: no asbestos found to date. (Analytical work being performed by McCrone -- E.M. with chemical verifications). A report on the whole study is planned for March 1978. Bryon Lord, DOT, 426-4980.

Levels in Lake Superior

Levels of asbestos in Lake Superior, rivers emptying into Lake Superior, and water intakes from Lake Superior are being established. Samples were collected in 1974. There were approximately 1000 samples; each fiber's length and width was noted. Data is still going into the computer, and there is as yet no anticipated date for the final report. (Note: this is not an ongoing monitoring program). William Fairless, Region V, (312) 353-8370; 8-353-8370.

Particulate Minerology Unit

~~Bom~~ Bom has established a group to assist in identification of specific minerals in particulate samples. R.A. Clifton, Bom, 634-1206.

Releases from Industry

Air is being sampled around iron ore beneficiation plants, and several have been found to have at least some asbestos. Gilbert Wood, OAQPS, (919) 688-8146 X 295; 8-629-5301.

PRODUCTION AND USE TRENDS

DRAFT

Bureau of Mines Reports

Every five years, a new book, Mineral Facts and Figures is prepared. The most recent chapter on asbestos has been completed and is available; the entire book should be printed shortly. Also, a Mineral Yearbook is published annually. This asbestos chapter is ready to go to the printer.

The only major new development in asbestos during the past year - from BON's point of view - is the re-opening of a large asbestos mine in California. The management is co-operating closely with safety authorities, and so far all safety standards are being met at the mine.

CRMC-MAD-000794

Characteristic Fiber Sizes

(Possible project, still in thinking stage). Under consideration is a project which would characterize fiber size for each of various occupations (operations). Correlation between electron microscopy and optical determination will be evaluated. John Dement, NIOSH (513) 684-3191; 8-684-3191.

Air Analysis

Work has been completed on a method for the analysis of air samples, which combines electron microscopy and X-ray diffraction. Report should be out within 6 mos. to one year. Phillip Cook (ORD) (218) 727-6692; 8-783-9574.

Leaching from A/C Pipe

Water of varied aggressiveness is being run through 90 foot loops of abestos/cement pipe, and leaching of abestos is being examined. Studies have also been done in real communities with water of various aggressiveness. Report will be available in mid 1978.

(This work will evaluate ASTM's formula to determine a water supply's aggressiveness to A/C pipe. It involves varying the parameters of ph, hardness of water). Earl McFarren, ORD (513) 684-7236; 8-684-7236.

Electron Microscope Methods for Analysis

An evaluation of electron microscope methods for measurement of airborne asbestos concentrations and the development of an optimal measurement procedure are under study. This activity will be completed in April 1977. Jack Wagman, ORD, (919) 549-8411; 8-629-1428.

X-ray Diffraction Method for Analysis

Naval Research Lab, in conjunction with ORD, has developed a new X-ray diffraction procedure involving fiber pre-alignment. This will be used as a rapid screening enforcement method. It is specific and quantitative. Work will be completed by July '77. Jack Wagman, ORD, (919) 549-8411; 8-629-1428.

Air Monitoring

Work has begun on an automatic real-time fiber detector and counter, to be used for continuous monitoring of air. A prototype instrument should be made by December '77. Jack Wagman, ORD (919) 549-8411; 8-629-1428.

CONTROL AND DISPOSAL

DRAFT

Asbestos in a Community Water Supply

Greenwood, SC has a problem of leaching from the asbestos/cement pipe carrying the community's water supply. Various control methods will be tried; including addition of _____ ortho phosphate to the water. (In common use as a coat to prevent corrosion of metal pipes, never before tried on A/C pipe) and pH adjustment. Earl McFarren, ORD (513) 684-7236, 8-684-7236.

Solid Waste Disposal

Studies to develop techniques for control of emissions from asbestos-containing waste piles at asbestos/cement pipe have been completed. Chemical coverings and soil coverings have been investigated, plus ways to minimize dust during dumping. Mary Stinson, ORD, (201) 321-6683, 8-340-6683.

CRMC-MAD-000796

DRAFT

REGULATORY OPTIONS

Workplace Standard

The workplace standard is being changed from 5 f/ml to 2 f/ml. This is now undergoing promulgation. Dr. Goodwin, MESA, 235-8307.

Drinking Water Standard

Asbestos is one of the contaminant being considered in a study by the National Academy of Sciences on the health effects of contaminants in drinking water as a requirement of the Safe Drinking Water Act. The report should be available by March 1977. If NAS identifies asbestos as a health problem, WSD will then evaluate economic factors of regulation. Pat Tobin, 426-8877.

CRMC-MAD-000797

Manville

Internal Correspondence

M. Shumate

R-06

Date April 28, 1983

From J. P. Leineweber 1-06

W. Plichta R-34

Copies W. B. Reitze 1-06

Subject TALC IN TRANS SHIELD

Thank you for the data on the asbestos fiber content of the talc proposed for use as an asbestos substitute in Trans Shield. Considering the nature of the talc business I recommend that the following actions be taken to assure us of a continued supply of fiber free product.

1. The purchase specification for the talc should include the fact that it should contain less than 1% of potential asbestiform minerals as determined by X-ray diffraction.
2. The quality assurance program should include frequent analysis of the talc samples to be certain that the product is within the above specification.

J. P. Leineweber
J. P. Leineweber

APR 28 1983

CRMC-MAD-000798

UM Johns-Manville

f Jals
Internal Correspondence

To: See Below*

Date: Sept. 4, 1974

From: R. P. Carter

Copies: File & C

Subject: FDA'S REGULATION ON THE USE OF TALC

*J. S. Autry
E. M. Fenner
H. R. Keefe
P. Kotin, M.D.
R. S. Lamar
J. P. Leineweber
P. A. Martinson
G. E. Parker

F. L. Pundsack
W. B. Reitze
N. B. Scheffel
F. J. Solon, Jr.
W. C. Streib
C. J. Sulewski
W. L. VanDerbeek
R. J. Zazenski

As you will recall, the Food and Drug Administration initially published a proposed regulation on August 12, 1972, banning the use of talc containing asbestos in food and food packaging materials. On April 20, 1973, J-M forwarded its comments to FDA on that proposal. We included in our comments a substantial amount of data confirming our conclusion that no such regulation was justified or necessary.

On September 28, 1973, FDA published a second proposal which would additionally restrict the use of talc containing asbestos in any drug, drug ingredient or drug packaging material.

J-M's comments with respect to both proposals focused attention on four major areas: the value and use of talc in food and drug packaging materials; the results of migration studies conducted both in-house and outside; relevant medical studies; and suggested modifications to FDA's proposed test method for the identification of the presence of asbestos in talc.

On February 27, 1974, Dick Lamar and Jim Leineweber of our Research and Development Center and myself met with three officials from FDA to review various questions raised by FDA with respect to our comments in response to FDA's proposed regulations. As a result of that meeting, we agreed to respond to eleven specific questions raised by FDA and to conduct certain additional studies to confirm our earlier findings that tremolite does not migrate from paper packaging

CRMC-MAD-000799

J. S. Autry, et al
Page 2
Sept. 4, 1974

materials containing tremolitic talc to the food or drug contents during commercial handling and shipping.

Our Research and Development Center has now completed the additional studies requested. Attached you will find a copy of our cover letter dated September 4, 1974 to FDA and a memorandum responding to FDA's eleven questions. A meeting has been scheduled with FDA officials for September 12, at which time we will review the attached documents. We are optimistic that FDA will confirm our conclusion that there is no migration problem.

FDA is presently in the process of drafting a position paper to be published in the Federal Register, specifically reviewing the many comments submitted in response to their two proposals and reporting their conclusions thereon. I was advised by FDA this week that they believe it is still possible to include our new data in their position paper. At our September 12 meeting, we will make every effort to convince FDA not to impose any restriction on the use of talc containing tremolite in food and drug packaging applications. I will keep all of you advised as to the results of this meeting.

R. P. Carter

RPC/emr

Attachs.

CRMC-MAD-000800

Johns-Manville Corporation

Greenwood Plaza
Denver, Colorado 80217

Environmental Affairs Department

September 4, 1974

Dr. Corbin I. Miles
GRAS Review Branch
Division of Food and Color Additives
Bureau of Foods
Food and Drug Administration
200 C Street, S.W.
Washington, D. C. 20204

Dear Corbin:

As you will recall, on December 21, 1973, Johns-Manville Products Corporation submitted written comments to the Food and Drug Administration in response to FDA's Notice of Proposed Rulemaking relating to asbestos particles in food and drugs, as published in the Federal Register on September 28, 1973 (hereinafter referred to as the "Proposal").

On February 27, 1974, Dick Lamar and Jim Leineweber of our Research and Development Center and myself met with you, Al Holtz and Bill Eisenberg to review eleven questions raised by FDA with respect to our December 21, 1973 submission.

On April 2, 1974, I forwarded a letter to you outlining our understanding of the eleven questions posed, setting forth answers to those questions where information was readily available and outlining what we proposed to do to provide the requested information for the remaining questions.

Attached to this letter, is a memorandum listing each question posed and the information requested by FDA and Johns-Manville's responses thereto. Included in this memorandum, for the purpose of clarity and continuity, are those questions previously answered in part or in full in my April 2, 1974 letter.

The necessary research work undertaken to provide FDA with the information requested has taken a considerable amount of time. This was due to the nature of the work involved

CRMC-MAD-000801

Dr. Corbin I. Miles
Page 2
September 4, 1974

and the considerable demands placed on our Research facilities and personnel with respect to other important projects.

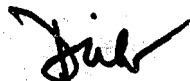
Additionally, our Research personnel place considerable importance on the integrity of the research work undertaken in response to FDA's questions and the necessity to obtain valid results.

The results of the research work undertaken in response to FDA's questions confirm the conclusion reached by Johns-Manville in our submission dated December 21, 1973, that tremolite does not migrate from paper packaging materials containing tremolitic talc to the food or drug contents during commercial handling and shipping. It is our hope that FDA will reach the same conclusion from the attached memorandum, and as a result, will not impose any restriction on the use of talc containing tremolite in food and drug packaging applications.

As we discussed in our telephone conversation yesterday, I am not enclosing the original photographs or charts, as we do not have any additional copies. I will bring the originals with me for our meeting at 2:30 P.M. on September 12. Dick Lamar, Jim Leineweber and Rich Zazenski from our Research and Development Center will accompany me at this meeting.

I look forward to seeing you on September 12 and hope it will be a most productive meeting for all concerned. We will be prepared to answer questions which you and your associates may have with respect to the attached memorandum.

Very truly yours,



Richard P. Carter, Director
Government Relations

RPC/emr

Attach.

CRMC-MAD-000802

MEMORANDUM PREPARED BY JOHNS-MANVILLE PRODUCTS CORPORATION
IN RESPONSE TO ELEVEN QUESTIONS POSED BY THE FOOD AND
DRUG ADMINISTRATION AT A MEETING HELD ON FEB. 27, 1974

These questions and the answers thereto relate to the comments dated December 21, 1973, submitted by Johns-Manville Products Corporation to the Food and Drug Administration in response to FDA's Notice of Proposed Rulemaking relating to asbestos particles in food and drugs, as published in the Federal Register on September 28, 1973.

The questions raised by FDA and Johns-Manville's responses thereto are as follows:

QUESTION 1

WHAT IS THE RELATIONSHIP BETWEEN THE FIBER COUNT AND THE SURFACE AREA OF THE CONTAINER (FOOD CONTACT AREA)?

The areas for the various food containers are as follows:

Salt shaking or scuffing test	18.18 sq. in.
Macaroni container	88.0 sq. in.
Carnation dried milk	138.0 sq. in.
Quick rice	160.0 sq. in.
Cornflakes	304.0 sq. in.
Morton's salt	45.0 sq. in.

In the case of the five packaged food items, TEM and petrographic analyses could not detect the presence of tremolite in any of the food that was packaged in tremolitic talc containing paper. Thus, the ratio of fibers to food contact area is zero for each item. There was no migration.

In the case of the four test containers (salt packaged in tremolitic-talc containing paper) that were shipped by truck approximately 4,000 miles, petrographic analysis revealed no evidence of the presence of any chrysotile or tremolite fibers due to migration. TEM examination of all four samples indicated only the possibility of one tremolite fiber in one of the test contents. For all practical purposes, the ratio of fibers to surface area for each of these samples is 0 fibers/18.18 sq. in. (Each container had an effective contact area of 18.18 sq. in. and a void space of 15 percent interior container volume to allow free movement of contents within the container.)

QUESTION 2

WHAT ARE THE LOWER LIMITS OF DETECTABILITY BY TEM, PETROGRAPHIC AND XRD METHODS FOR TREMOLITE AND CHRYSOTILE IN TALC?

The work which was undertaken to respond to this question should be qualified in one important aspect. We have interpreted the

CRMCMAD-000803

limits of identification to mean the levels at which positive identification can be made by each method. As a review of the data below will indicated, this is an important consideration.

A. Petrographic identification of tremolite and chrysotile in comminuted talc using Johns-Manville's modified FDA method at a magnification of 500X.

1. Tremolite - In general, positive identification of tremolite can be made on fibers as small as 2.5 x 7.5 microns. However, in some samples examined, positive identification can be made on fibers as small as 1.5 x 5 microns. Unlike "fibrous talc", the Becke line can be followed readily if there is a mis-match in indices of refraction. However, by our method, we use an index oil of 1.622 to match the gamma index at the position of inclined extinction which can vary from 14 to 20 degrees (gamma index relative to the Z direction). Tremolite is also non-pleochroic whereas actinolite and ferroactinolite can be highly pleochroic, accompanied by higher indices of refraction. An experienced petrographer will also look for good cleavage along (110), parting along (100), and twinning along (100), and sometimes along (001). At a position of 90 degrees from inclined extinction, the fiber will show high relief since alpha index is indicated and is on the order of 1.599.
2. Chrysotile - The identification of chrysotile is very much like tremolite since positive optical identification can be made on fibers as small as 2.5 x 7.5 microns. The technique involves using 1.566 oil to capture the gamma index in parallel extinction in which the fiber will disappear or show Christiansen effect in plane polarized light. At 90 degrees from the gamma position, the fiber will show high relief since the alpha index is 1.549 or less. Maximum interference color (Birefringence) is shown at 45 degrees. It is not unusual for chrysotile to show undulatory extinction. Fibrous talc also shows parallel extinction, but the relief is high in either direction; but a match with the 1.556 oil can occur anywhere from 45 to 80 degrees.

B. TEM detectability

1. Tremolite - Tremolite fibers cannot be positively identified by TEM. Usually, tremolite is verified by chemical, optical or X-ray diffraction methods and then dense asbestiform amphibole morphology is viewed by TEM as tremolite. The electron diffraction pattern of tremolite is similar to all other mono-clinic amphiboles. (See Figure No. 1, attached). Using the RCA EMU 3B, it is possible to see tremolite on the order of a few hundred Angstrom units. However, it appears to be the nature of tremolite to remain on the coarse side when compared to chrysotile.

2. Chrysotile - Chrysotile fibers can be positively identified by morphology and electron diffraction. (See Figure No. 2, attached). The electron diffraction pattern is distinctive since alternate rows of Laue spots are not spots but rather elongated streaks. The morphology is most unusual since chrysotile is characterized by an internal low density tubular structure which is sometimes beaded. The most narrow of individual fibrils of chrysotile are on the order of 250 Angstrom units. Below this width, the mineral ceases to be chrysotile. The most common magnification employed for the study of chrysotile and asbestiform amphiboles is 8000X. The negative is enlarged 2.5 times to provide an 8.5 x 10-in. print at a magnification of 20,000X.

C. XRD identification

Qualitative evaluations at 2°/minute and quantitative evaluations at 1/4°/minute were performed using Ni filtered CuK radiation.

1. Tremolite - With qualitative examination through the 9.4 A peak area, detection could be made at the level of 0.5% tremolite in talc. However, quantitative evaluation could not be made below 1.0% even though samples containing 0.0, 0.25, and 0.5% tremolite were compared to background counts, with none having counts above background.
2. Chrysotile - While 1.0% chrysotile can be detected by XRD under the 7.3 A peak, positive identification by this means may be difficult because of the conflict between major chlorite peaks and serpentine peaks. The former appear at 7.3 and 3.65 A and would obscure chrysotile concentrations. Serpentine has a minor peak at 2.15 A which differs slightly from the minor 2.10 A peak, but neither would be apparent at low concentrations of either mineral or combinations of the two. In the absence of chlorite, 1% chrysotile (in talc) was measurable, but small quantities of chrysotile in the presence of serpentine would not be detected.

From the foregoing, we believe the following conclusions can be substantiated:

- (1) Individual tremolite particles 2.5 x 7.5 microns can be positively identified petrographically and under some circumstances, particles as small as 1.5 x 5 microns can also be identified.

- (2) Tremolite particles cannot be positively identified as such by TEM, since they cannot be distinguished positively from other amphibole mineral.
- (3) Tremolite particles can be detected at the 0.5% level by XRD but their quantity cannot be determined accurately below 1.0%.
- (4) Chrysotile fibers 2.5 x 7.5 microns can also be positively identified petrographically.
- (5) Chrysotile can be positively identified by TEM morphology and electron diffraction, with the lower limit of fibril width being of the order of 250 Angstrom units. Below this figure, the mineral ceases to be chrysotile.
- (6) The chrysotile content of talc can be determined at the 1.0% level only if the commonly associated minerals, chlorite and serpentine, are not also present. If they are present, chrysotile may not be positively identified.

QUESTION 3

PROVIDE VALIDATION AND RECOVERY DATA FOR TREMOLITE AND CHRYSOTILE IN SPIKED SAMPLES OF TALC - SAMPLES OF TREMOLITE AND CHRYSOTILE-FREE TALC TO WHICH KNOWN AMOUNTS OF TREMOLITE AND CHRYSOTILE HAVE BEEN ADDED.

The following data contains our findings with respect to Petrographic, TEM and XRD examination of a series of standards made from amphibole-free talc and varying percentages of tremolite. In addition, XRD examination of similar talc - chrysotile standards was made, but a set of talc - chrysotile standards suitable for Petrographic and TEM examination was not available. Because little, if any, chrysotile-containing talc is used by the pulp and paper industry, it was decided that the very time consuming preparation of such standards was not warranted in view of the detection data already made available.

A. Tremolite validation

The following tabulation sets forth tremolite content vs. numbers of "fibers" in talc samples. In all cases, the number of tremolite particles should be read as $\pm 20\%$. So-called fibers are tremolite particles having a 3:1 aspect ratio and a length of at least 5 microns counted at 500X.

<u>Sample</u>	<u>Percent Tremolite By Weight</u>	<u>No. of Tremolite "Fibers" per mg of Talc</u>
F-1 Standard	0.25%	41,000
F-2 Standard	0.50%	61,000
F-3 Standard	1.00%	111,000
F-4 Standard	2.00%	207,000
F-5 Standard	4.00%	400,000
F-6 Standard	16.00%	1,800,000
Tremolite-free Talc	--	0

The slight lack of linearity is due to the difficulty in obtaining sufficiently dispersed slides to permit unhindered counting, i.e., a top layer of particles obscuring lower layers, and the counting precision noted above.

Figures 3 and 4, attached, are electron photomicrographs (TEM) of two of the above materials. Figure 3 is the tremolite-free talc at 20,000X as reproduced here. Figure 4 is the same talc spiked with 0.5% tremolite (F-2 Standard). There are three (3) tremolite "fibers" present and these are the most dense in the entire print. Other similar looking particles in both pictures are talc platelets on edge. Each tremolite particle identified represents 1,100 particles per mg of sample.

Figure 5, attached, is a composite XRD tracing covering the same series of samples used for the petrographic examination. The various levels of tremolite added, from 0 to 16% by weight, are indicated along with the height of the 9.4 Å peak for each. For samples having no or 0.25% tremolite, there is no discernible peak. At 0.5%, an identifiable peak appears which becomes more prominent as the percentage of tremolite increases.

This latter phenomenon can be used to estimate the amount of tremolite present when compared to a sample containing a known and discernible amount of tremolite. This is done by determining the number of counts or units of area under the peak. Figure 6, attached, is a plot of counts vs. tremolite content of the same standards, extended in this case to include one having 50% tremolite. All counts are corrected for background. The lowest level having a count above background is 1.0%. Above this point, the relationship between point count and tremolite content is seen to be quite linear, and it could be used as a reliable means of assessing tremolite content above that

B. Chrysotile

As noted previously, no comparable series of chrysotile-spiked samples suitable for petrographic and TEM examination is available. Differences in the manner of dispersion of the fibers, makes samples for microscopy much more difficult to prepare than those for XRD. Some samples for XRD were prepared for this study.

Figure 7, attached, is a composite XRD tracing of talc, and talc with chrysotile added in the amounts of 1.2 and 2.2% respectively. It should be noted that the 7.3 Å peak is sufficiently well developed to indicate that a quantitative evaluation could be made at about 1%.

However, It must be emphasized that chlorite and serpentine produce identical to similar peaks if present. As an illustration, Figure 8, attached, is an XRD tracing for a mixture of 60% chrysotile and 40% serpentine (without talc) showing the peaks between 2.10 and 4.57 Å. Only the peaks at 2.10 Å for chrysotile and 2.15 Å for serpentine are distinguishable. However, if these were included in a mixture which was mainly talc, they would no longer be discernible.

The above leads to the conclusion that chrysotile can be positively and quantitatively identified by petrographic or TEM means. However, a quantitative gravimetric evaluation must take into account that chlorite and/or serpentine minerals cannot be present.

QUESTION 4

A REQUEST WAS MADE THAT, WHEREVER POSSIBLE, WE RETAIN ALL SAMPLES, PREPARATIONS, SLIDES, ETC.

Wherever possible, we are doing this. Petrographic slides, however, are not permanent. Immersion oils change with age and exposure to air. We are retaining the negatives for all TEM's.

QUESTION 5

IN OUR SALT-SCUFFING TESTS, DO WE HAVE DATA FOR 10 CPS TESTS SIMILAR TO 19 CPS TESTS? DO WE HAVE TEM TEST RESULTS AT 10 CPS? DO WE HAVE RETAINED ASH SAMPLES?

The data on the 10 cps test is as follows:

<u>Sample</u>	<u>% Talc in Paper</u>	<u>Residue Due To Scuffed Paper (gms)</u>	<u>Number of Talc Particles*</u>	<u>Number Of Chrysotile & Tremolite Fibers</u>
RS 73242-2A	1.0	0.00000	0	0
RS 73242-2B	1.0	0.00000	0	0

*Residue viewed petrographically at 500X.

These results are discussed on pages 3 and 4 of Report No. E414-2, Preliminary Studies of Food Contamination by Contact with Paper (Exhibit I, Johns-Manville submission dated December 21, 1973). There are no TEM results at 10 cps, as there are none for any of the artificial test results. TEM analysis began on samples that had actually endured road travel and on the analysis of actual food contents.

Except for TEM negatives, we have not retained ash samples of any work prior to March 1, 1974. Whenever possible, we are doing so now.

Although FDA requested that we repeat these salt-scuffing tests, based on the research work undertaken in preparation of our submission dated December 21, 1973, and based on the additional work reported herein, we have reached the conclusion that it is futile to run additional artificial scuff tests at this time. An artificial test is generally any test which simulates an actual occurrence. It is usually run on a smaller scale and at accelerated times. Before any laboratory test can be designed to simulate an actual or large-scale occurrence, all of the parameters and variables must be known so that they can be scaled down correctly. Only by knowing these parameters and variables, can one even begin to design and build a simulated model which will produce valid test results.

In the case of the artificial scuff tests, we were requested by FDA to run and re-run paper samples on the artificial scuff tests. It was assumed that a test of this nature would simulate the vibrating action which food packages undergo during normal commercial shipping and handling. This is a dangerous assumption. The simple procedure of placing a test container on a vibrating table, vibrating at an arbitrarily chosen amplitude and frequency for an arbitrarily chosen period of time, simply cannot be said to simulate actual shipping and handling. Any conclusions or correlations between this artificial test and actual road travel would be completely unfounded. Yet, in the months of study on this subject, many people have tried to compare the two. Such erroneous assumptions can lead to mistaken conclusions.

Based on the research work completed thus far, we have concluded that the only data which warrants consideration is that data which is supplied by examining actual food contents and test contents that undergo actual road travel. For these reasons,

the results and conclusions discussed in Report No. E414-6, Lack Of Food Contamination By Contact With Paper Due To Shipping (Exhibit II, Johns-Manville submission dated December 21, 1973), and the data furnished in response to Question 9 herein, should be regarded with the utmost importance.

QUESTION 6

PROVIDE A DESCRIPTION OF OUR METHOD AND A SAMPLE CALCULATION OF OUR XRD ANALYSIS OF FOOD PACKAGING PAPER FOR TALC CONTENT.

XRD analysis of food packaging paper for talc content is performed by scanning the paper over the 9.4 A peak and computing the percent of talc present from the ratio of the area count obtained for the unknown paper to the area under the peak of a standard paper of known talc content. Papers of verified talc contents ranging from 0.53% to 12% talc are used for standards.

A. Sample Calculation: Unknown Paper Sample

Scan 200 sec from 9.9° to 8.23° $2\theta = 64,056$ counts

Background Determination:

Count for 100 seconds at 9.9° $2\theta = 25,394$ counts

Count for 100 seconds at 8.23° $2\theta = 24,187$ counts

49,581 counts (total background count)

64,056 counts (total sample counts)

-49,581 counts (total background counts)

14,475 counts contributed by talc in paper sample

B. Standard Sample: 2.5 Percent Talc

The same procedure determines that the 2.5 percent standard has a total count due to the talc of 15,069 counts.

The percent talc in the unknown paper sample is computed by:

$$\frac{14,475 \text{ counts (unknown sample)}}{15,069 \text{ counts (2.5 percent standard)}} \times 2.5\% \text{ talc} =$$

2.4% talc in unknown paper sample

QUESTION 7

IN TABLE IV-A ON PAGE 11, REPORT NO. E414-2 (Exhibit I, JOHNS-MANVILLE SUBMISSION DATED DECEMBER 21, 1973), THE SIX-HOUR RESULTS APPEAR ON PAGE 12. CAN THIS ANOMALY BE EXPLAINED?

As for the irregularity of the six-hour results, we can only suggest the possible source of error, since a definite explanation is not known. We strongly believe the anomaly is a result of a human error, probably committed early in the weighing procedure. The belief that the anomaly is due to human error, is strongly supported by the other data. Since six out of seven data points form a definite, regular curve, and since the irregular data point is not at either end of the curve, but somewhere in between, scientific logic suggests that the point should be disregarded and labeled as a procedural error.

QUESTION 8

PROVIDE VALIDATION OF THE MEAT WRAPPING AND SAMPLING TESTS AND THE SENSITIVITY OF THESE TESTS. IN ADDITION, RELATE ANY MIGRATION TO MEAT SURFACE OR MEAT WEIGHT.

This question relates to the McCrone meat wrapping studies (Exhibit E, Johns-Manville submission dated April 20, 1973) in which talc-containing papers were placed in contact with raw meat. Subsequent examination of the meat, both in thin sections and after ashing, showed no migration of tremolite.

The question raised by FDA was whether talc containing tremolite would have been detected if present in the meat in McCrone's studies. The answer is essential to the validity of McCrone's finding that no migration of tremolite had occurred.

An experimental plan, a copy of which is attached hereto as Figure 9, was devised to confirm the presence or absence of tremolitic talc on meat under known conditions. Preliminary experiments indicated that there is no practical way to determine the lowest level of detectability, which was one element of the FDA question, because we could not uniformly spread extremely small amounts of tremolitic talc over a known area. Applications of the order of 0.1 to 0.2 mg/cm² are so apparent, however, that the limit of detectability is probably at least three orders of magnitude lower, i.e., 0.0001 to 0.0002 mg/cm². We were unable to devise a means of applying such small amounts.

Test Results

Using the procedure described in Figure 9, samples were prepared from three steaks, the first a control having no contact with tremolitic talc except what might have come from the wrappings and mask, the second having an applied dose of 0.12 mg/cm² of J-M CYCLO-ORB, and the third having an applied dose of 0.16 mg/cm² of J-M CYCLO-FIL. Samples of all paper in

contact with the meat were also obtained to identify any source that could have lead to contamination of the control.

The three samples of raw meat scrapings were examined by optical microscope at 500X. Results are reported as follows:

<u>Sample Number</u>	<u>Sample</u>	<u>Talc</u>	<u>Tremolite</u>
4384-38-4 (Fig. 10)	Meat Control	None detected	None detected
4384-38-5 (Fig. 10)	Meat with 0.12 mg/cm ² CYCLO-SORB	Present	Present
4384-38-6 (Fig. 11)	Meat with 0.16 mg/cm ² CYCLO-FIL	Present	Present

Three pictures, attached, as Figures 10 and 11, are photomicrographs of the three meat samples above, taken at 500X. It should be noted that talc and tremolite particles are readily visible in the samples to which CYCLO-SORB and CYCLO-FIL were applied, but neither talc nor tremolite could be confirmed in the blank. The CYCLO-FIL-dosed sample also illustrates the problem mentioned earlier of obtaining even distribution of dispersion of very small amounts of talc, in this case 0.16 mg/cm², and obtaining representative samples therefrom. The fibrous material in all of these pictures is part of the raw meat structure.

Meat and paper samples were then ashed for 16 hours at 800°F. There was considerable difficulty in reducing the carbonaceous content of these samples to low enough levels to permit reliable examination, but this was finally achieved. Optical microscopy results are as follows:

<u>Sample Number</u>	<u>Sample</u>	<u>Talc</u>	<u>Tremolite</u>
4384-38-4	Meat Control	None detected	None detected
4384-38-5	Meat w/CYCLO-SORB	Present	Present
4384-38-6	Meat w/CYCLO-FIL	Present	Present
4384-38-1	Mask Paper	Trace	None detected
4384-38-2	Outside Wrapper	Trace	None detected
4384-38-3	Meat Contact Wrap	None detected	None detected

The final part of FDA's question relates to number of tremolite particles applied meeting the standard of 5/4 length with a 3:1 aspect ratio. The 0.12 mg/cm² CYCLO-SORB applied is estimated to contain 390,000 (±20 percent) tremolite particles meeting the above criteria. The 0.16 mg/cm² CYCLO-FIL applied is estimated to contain 1,250,000 (±20 percent) tremolite particles meeting the criteria. No attempt was made to enumerate talc particles in either case, since such particles do not generally fit the criteria. However, many millions of particles can be seen and particle size analysis indicates that there are many millions more that are sub-optical microscopic.

Based on the high numbers and degree of detectability of both talc and tremolite particles on meat samples and ash in this study, it is concluded that McCrone's finding, that migration of tremolite from the tremolitic talc-containing wrappings did not take place, is valid. Had even a very low order of migration taken place, it would have been detectable.

QUESTION 9

PERFORM BOTH SCUFFING AND SHIPPING TESTS USING PAPER WITH HIGH LOADINGS OF TREMOLITIC TALC (PAPER WITH THE HIGHEST LEVEL OF TREMOLITIC TALC THAT IS COMMERCIALY USED FOR FOOD PACKAGING WRAP).

See our answer to Question 5 as to why we did not perform additional scuffing tests.

As requested by FDA, salt shipping tests were repeated, employing papers with high loadings of tremolitic talc. To briefly review the test, it consists of lining salt-filled glass jars with test papers and shipping them by truck approximately 4,000 miles (For a more complete description of the test procedure utilized, see Johns-Manville's submission dated December 21, 1973). By utilizing this procedure, we can duplicate, if not exceed in stringency, the conditions under which food packages are shipped.

The test results reported hereinafter were obtained from papers with exceptionally high loadings of tremolitic talc. The papers used to line the salt-filled glass jars contained 9%, 14% and 20% of Johns-Manville's CYCLO-FIL talc. The 9% and 14% CYCLO-FIL papers were obtained from a Johns-Manville customer which purchases CYCLO-FIL. The 20% CYCLO-FIL papers were previously made by Johns-Manville for testing purposes, using CYCLO-FIL. Therefore, we knew that tremolite was present in all of the paper used to line the salt-filled glass jars, as CYCLO-FIL contains approximately 30% tremolite. To confirm the presence of talc in the paper used in this test, the analytical method

set forth in our answer to Question 6 of this memorandum was utilized. Our XRD analysis of these papers confirmed the presence of talc.

It is essential to note that after an exhaustive search, we were unable to locate any food packaging paper containing loadings of talc in excess of the paper utilized in the salt shipping tests reported in Exhibit II to our December 21, 1973 submission. As noted in our December 21, 1973 submission, papers with high talc loadings would normally not be used for direct food packaging applications. However, FDA requested that we specifically subject highly loaded talc papers to the salt shipping test. Therefore, these highly loaded talc papers, which are manufactured for such purposes as writing paper, textbooks, etc. (as indicated by our customers), were utilized.

A misunderstanding which may have arisen from our December 21, 1973 submission should be clarified. High brightness talc (i.e., CYCLO-FIL) is used in the manufacture of fine paper products as a high-brightness filler and opacifying pigment. Its loading ranges may vary from 2% to 15% by weight. CYCLO-FIL and other related ultra-fine particle size white pigments are used to increase opacity and brightness and in many instances to improve the printing characteristics of the paper. The ultra-fine particle size also develops a unique synergistic effect when blended with TiO_2 . It not only acts as a spacing mechanism, but also attracts the TiO_2 to the platey planar surface, thus resulting in increased efficiency from TiO_2 usage.

However, it is important to emphasize that high brightness fillers and pigments are used only for fine paper products, such as printing (magazine) paper, writing paper, labels, etc. Costs prohibit its use in paper whose application does not warrant high brightness and opacity, such as newspaper, cardboard, paper bags, etc. Most paper which is used in food packaging applications would fall into this second lower grade category. There is no need to load this paper that comes into direct contact with food with high brightness fillers and pigments, because it is rare that this paper is ever used for outside labeling. However, this lower grade paper (lower grade so far as brightness and ink receptivity are concerned) is generally then wrapped with a bright, high grade paper, which is then suitable for labeling and attractiveness. Therefore, papers that are loaded with high concentrations of high brightness pigments and fillers are used only indirectly so far as food wrapping applications are concerned. This type of paper is normally not used on a direct food-contact basis. As a result

of all of our research efforts and investigations, we have been unable to locate food packaging paper containing more than 1.5% talc. Such paper was utilized in the scuffing and salt shipping tests reported in Exhibits I and II of our December 21, 1973 submission.

The salt shipping tests which were repeated with highly loaded talc paper, utilized the identical test procedure employed in the tests described in our December 21, 1973 submission. The results reported in Table 1 below were obtained by employing the TEM at 11,000X. The proposed FDA criteria for identifying asbestos fibers (as published in the Federal Register on September 28, 1973) was employed.

Table 1

Examination of Shipped Test Sample Residues By
Transmission Electron Microscopy - Plain Uncoated Paper

<u>Sample No.</u>	<u>Percent Talc in Paper</u>	<u>11,000X TEM Plate No.</u>	<u>Chrysotile</u>	<u>Tremolite</u>
4385-78-7	9	2282A	0	0
		B	0	0
		C	0	0
		D	1 Bundle *	0
		E	10 μ long 1 Fiber * 10 μ long	0
4385-78-10	14	2283A	0	0
		B	0	0
		C	0	0
		D	0	0
		E	0	0
4385-78-12	20	2284A	0	0
		B	0	0
		C	0	0
		D	0	0
		E	0	0

Table 2, following, reports shipping test results using the same papers, after they were coated with a thin film of Flexbond 811 prior to testing. As indicated in our April 20 and December 21, 1973 submissions, paper food containers are normally either lined on the inside with plastic (such as polyethylene) or coated with a thin film of wax or plastic. This is done for two reasons: (1) to help keep the food fresh, and (2) to prevent the paper from absorbing moisture, oils, taste and fragrance from the food. Because this is a real situation, we decided to simulate this type of container to see if it was possible for the salt to abraid through the coating, thus exposing the paper to the food. The Flexbond employed in this test was a polyvinyl acetate co-polymer.

Most likely due to contamination, as bundles of chrysotile are not found in Johns-Manville's talc.

CRMC-MAD-000815

Table 2

Examination of Shipped Test Sample Residues by TEM
Papers Coated with Flexbond 811

<u>Sample No.</u>	<u>Percent Talc in Paper</u>	<u>8,000X TEM Plate No.</u>	<u>Chrysotile</u>	<u>Tremolite</u>
Salt Blank		2293A	0	0
		B	0	0
		C	0	0
4385-78-7F	9	2290A	0	0
		B	0	0
		C	0	0
4385-78-10F	14	2291A	0	0
		B	0	0
		C	0	0
4385-78-12F	20	2292A	0	0
		B	0	0
		C	0	0

CONCLUSIONS:

1. The results reported in Tables 1 and 2 clearly indicate that even the most severe of actual shipping and handling conditions are not severe enough to cause destruction of food packaging paper. Since the paper is not degraded, there is no migration of tremolite fibers.
2. The above conclusion is supported by shipping test results on test papers that had as little as 0.25% tremolitic talc to as much as 20% tremolitic talc.
3. The results also indicate that the migration of paper additives, such as tremolitic talc, depends on the strength of the paper and not the amount of additives that are contained in the paper. Since we have determined that the paper itself must be physically degraded in order for migration to occur, and since we have found that actual shipping and handling conditions are not severe enough to cause commercial paper to degrade, the fact remains that regardless of the quantity of tremolitic talc which commercial food packaging paper may contain, there should be no fear of tremolite migration and contamination. The conditions are simply not present to cause such an occurrence. To visibly demonstrate this conclusion, we have attached SEM photographs displaying the surface of on test papers (14% talc by weight). Figure 12

attached, is a picture of the surface of the paper before going through the shipping test. Figure 13, attached, is a picture of the surface of the paper after testing. Both pictures are virtually identical and indicate that the paper obviously was not degraded.

QUESTION 10

WHAT ARE THE EFFECTS OF ASHING TREMOLITE AND CHRYSOTILE?
WHAT HAPPENS WHEN PAPER CONTAINING TALC, TREMOLITE AND
CHRYSOTILE IS INCINERATED?

When any sample containing tremolite or chrysotile is ashed, the purpose is to eliminate any carbonaceous material which might mask the sample and hinder its examination. However, in order not to affect the tremolite or chrysotile, a temperature is selected which is a safe distance below that which would alter the lattice crystals. For our own analytical preparations, we use 800°F. In an oxygen rich atmosphere, this temperature is sufficient to oxidize the carbon which may be present in the form of cellulose or any other organic materials. However, this temperature is well below that which would affect the asbestos. Chrysotile will remain unaffected until 1382°F and tremolite will withstand temperatures to 1796°F. At these respective temperatures, the minerals will lose their bound water and the crystal lattices would collapse.

QUESTION 11

EXPLAIN THE HIGH TALC CONTENT IN THE SALT BLANK AND REPEAT
THE TEST RESULTS.

When we initially began our test program to study the possible migration of tremolite from tremolitic-talc containing paper, laboratory work was performed in an area which also houses many talc-related testing equipment. Therefore, it is very likely that the first few test results (artificial scuff test results) were artificially high in talc content due to airborne contamination. When the first salt blank was reported to contain approximately 8,000 talc platelets in its residue, the laboratory work was immediately moved to an area which would be less likely to contain airborne contamination. Future salt blanks showed a decrease in talc content down to ranges of 700 to 1000 platelets per membrane. In an effort to further decrease this level, modifications were designed into the testing procedure to reduce as much as possible the open-air time exposure of all test components. This last measure reduced the background count to less than 500. The very fact that we could not completely

eliminate the talc background indicates that TEM evaluations of actual test samples may have detected talc platelets which did not come from migration.

However, since our December 21, 1973 submission, time has permitted the set-up of a "clean room", in which the background count of airborne contamination is essentially zero. The test results reported in response to Question 9 herein, were obtained from samples which were completely prepared for microscopy in this "clean room".



Johns-Manville

Internal Correspondence

File
Date: 9/22/76

To: M. Harris - 2S2

From: D. E. Hillier - 4N3

Copies: Paul Kotin, M.D. - 4N2 ✓ J. M. Fletcher - 2S3 F. E. Brandt - 4N4
A. T. Stroebe - 2S3 J. Goldfield - 4N4 File & Chrono

Subject: LOS ANGELES TALC PLANT
C50-7261

This is in reply to your request for an estimate of the cost to provide all necessary equipment at the L. A. Talc plant to reduce dust exposure in total plant to be level of 2F/CC.

Estimated Costs

1. Dust Control Packers	\$ 97,600
2. Dust Control - Unloading, Crushing Transfer & Storage	159,300
3. Vacuum Cleaning System	18,000
4. Upgrade Existing Facilities	38,000
TOTAL (Includes Contingencies & Engineering)	<u>\$312,900</u>

NOTES: No escalation in above estimate.
No noise control included.
All work by outside contractor
Estimated completion time 6-8 months.

I have advised P. Kotin that if this money is approved and a Type "D" assignment placed on Environmental Engineering, we would start immediately and issue monthly, or more frequent, status reports on job progress.

D. E. Hillier
DEH

CRMC-MAD-000819



Johns-Manville

MAR 25 1976

Internal Correspondence

To: W. B. Reitze - 4N

Date: March 22, 1976

From: R. K. Comann - 2S

Copies: P. Kotin, M.D. - 4N
J. M. Fletcher - 2S

G. E. Parker - 5W
L. Turner - L.A. Talc

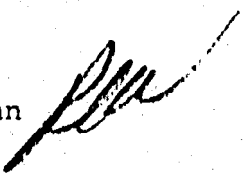
Subject: LOS ANGELES TALC PLANT -
RESPIRATOR AND HOUSEKEEPING PROGRAMS

This will confirm the following action program taken at the L.A. Plant:

1. Respirator program has been established. Please refer to the attached letter dated March 12 from L. Turner.
2. Additional portable vacuum cleaners have been obtained and will be used in place of brooms in the plant. Present small Hoffman cleaner also being used all possible.
3. Daily and weekly spot checks on all shifts being made by either L. Turner or her designate to insure that all employees are wearing respirator masks. Written report being submitted each week to you and to DHQ from Mrs. Turner confirming that this is being done. Strict disciplinary action being taken on any violations.
4. Daily and weekly housekeeping inspections being made by L. Turner and staff with results and corrective action discussed at weekly staff meetings.
5. Additional warning signs have been installed per your recommendations.

I feel confident that L. Turner is doing all possible to comply with instructions from Dr. Kotin and from you. During my visit last week, I found the housekeeping much improved with all employees and visitors wearing masks.

We certainly appreciate the assistance and recommendations you and Dr. Kotin have given Loretta. If you have any further recommendations that should be done at this time, please let Loretta or me know.

R. K. Comann 

CRMC-MAD-000820

Attachment



Johns-Manville

Internal Correspondence

To: R. K. Comann - 2S

Date: March 12, 1976

From: L. Turner - L.A. Talc

Copies

Subject: RESPIRATOR PROGRAM

An established program for cleaning and inspection of employee respirators at the L.A. Talc plant has been completed. The guidelines as outlined by Dr. Paul Kotin were the basis for the following procedures.

- 1) A cabinet has been purchased and installed in the Abrasion Room for individual respirators. A bin has been labeled and assigned to each individual employee.
- 2) Daily a clean respirator, sealed in a plastic bag, will be placed in each individual bin by supervisory personnel.
- 3) No employee will be permitted to enter the plant area, at the beginning of his shift, without obtaining his clean respirator from the respirator cabinet.
- 4) 2 respirators, labeled with the employees initials, has been issued per person. W. Reitze concurred in the issuance of the two respirators per person, and a new set of 30 was purchased.
- 5) A daily and weekly respirator cleanup program has been established to be completed by supervisory personnel.
- 6) Daily Procedure:
 - (a) Plastic container, marked "Dirty Respirators" has been placed on top of respirator cabinet. Each shift leader will be responsible for depositing the dirty respirators for each member of his crew, at the end of the shift.
 - (b) Supervisory personnel will collect dirty respirators once per day - wash, sanitize, change filters and replace in sealed plastic bag.
 - (c) Each morning cleaned respirators will be replaced in proper employee bins.
- 7) Weekly Procedure:
 - (a) J. Boyer, Quality Control Technician, will check each respirator for defective parts.
 - (b) Replacement of worn parts will be made and a written report completed showing - Date of Inspection - Parts Replaced.

L. Turner
Acting Plant Manager

CRMC-MAD-000821

Johns-Manville
Products Corporation

Los Angeles Talc Plant

840 S. Mission Road
Los Angeles, Calif. 90023
(213) 262 4117

March 12, 1976

NOTICE TO ALL EMPLOYEES

A new respirator program is now in effect. Listed below are the new rules and procedures each employee will follow:

- #1. All hourly employees are assigned 2 respirators with their initials marked on each respirator.
- #2. At the start of your shift, each employee will obtain their clean respirator from slot marked with their name in the respirator cabinet, (located in the valley abrasion room). Put empty plastic bags in box marked "Plastic Bags".
- #3. At the end of your shift, each employee will turn in his dirty respirator TO HIS CREW LEADER.
- #4. The crew leader in charge will be responsible to see that all employee's respirators on his shift are deposited in the plastic pail marked "Dirty Respirators" at the end of his shift.
- #5. All employee's respirators will be cleaned and filters replaced on a daily basis by the company. Each week an inspection will be made of all respirators and parts will be replaced as needed.
- #6. Employees will no longer need to contact John Boyer, Quality Control Tech., for respirator parts or supplies.

All employees are required to follow the above rules and procedures without fail. Any employee found neglecting these rules will be subject to disciplinary action.

L. Turner
L. Turner
Acting Plant Manager

CRMC-MAD-000822

To: J. FLETCHER

Date: FEB. 26, 1976

From: W. B. REITZE

Copies: P. KOTIN, MD; R. K. COMANN

Subject: VACUUM SYSTEM

AT KENT COMANN'S REQUEST, I CALLED LORETTA TURNER AT THE L.A. TALC PLANT AND DISCUSSED WITH HER IN QUITE SOME DETAIL THE RESPIRATORY PROTECTION PROGRAM.

IN OUR CONVERSATION REGARDING GENERAL HOUSEKEEPING, THE USE OF BROOMS WAS MENTIONED. I INFORMED HER THAT THE USE OF BROOMS FOR SWEEPING ASBESTOS DUST WAS POOR HOUSEKEEPING PRACTICE AND DUST SHOULD BE VACUUMED UP. LORETTA INFORMED ME THAT THERE IS A RATHER NEW VACUUM SYSTEM WHICH HAS BEEN DIS-ASSEMBLED AND IS CURRENTLY LAYING AT THE DUNN PLANT. SHE ALSO INFORMS ME THAT THERE IS NO MONEY AVAILABLE TO MOVE THIS VACUUM SYSTEM TO THE L.A. OPERATION.

I WOULD LIKE TO STRONGLY URGE THAT MONEY BE MADE AVAILABLE FOR THE MOVE AND INSTALLATION OF THIS VACUUM SYSTEM FROM THE CLOSED DUNN OPERATION TO L.A. BOTH DR. KOTIN AND I FEEL THAT WE ARE BEING JUST A BIT UNREASONABLE IN TELLING LORETTA TURNER THAT SHE MUST MAINTAIN GOOD HOUSEKEEPING PRACTICES AND THEN NOT GIVING HER THE TOOLS TO WORK WITH.

IF YOU SHOULD NEED ANY ASSISTANCE FROM EITHER DR. KOTIN OR MYSELF IN SECURING THE NECESSARY FUNDS, PLEASE DO NOT HESITATE TO CONTACT US.



W. B. REITZE

CRMC-MAD-000823

C O N F I D E N T I A L



Johns-Manville

Internal Correspondence

To: P. Kotin, M.D. - 4N

Date: Feb. 19, 1976

From: J. M. Fletcher - 2S

Copies: File & C

Subject: LOS ANGELES PLANT

We appreciated your visit and your advice to both Mrs. Loretta Turner and Kent Comann.

You will appreciate that the whole Western Talc situation has been a very traumatic experience. We now believe that we have a handle on markets, optimum production output, best mine contractor prices, and environmental engineering situation.

The whole L.A. picture depends on whether the markets will hold with the prices necessary to make the operation profitable. Assuming that the results will be positive, we have specific steps planned to turn this whole operation around into a proper on-going contributing situation.

Recognizing that we only have five salary people who now know what they must do, our present priority is simply to buy a little time. Other than giving us the assistance and direction of Bill Reitze (which we will follow to the letter), we would ask for nothing further until your next visit in April. At that time we will know whether we can go forward or be plowed under.

You and I both realize that none of the original appropriation environmental steps were taken, even though \$1.5 million was allotted in the purchase appropriation. We also both know that because of the history since acquisition, everybody would like to see it off the books. I just don't feel that it has ever had a fair chance with either operating or engineering know-how, nor with required expenditures. Together with John Swensen, we want to give it one last try and believe that nothing further can assist other than having a little time to prove out one way or the other.

CRMC-MAD-000824

To: J. FLETCHER

Date: JAN. 9, 1975

From: W. B. REITZE

Copies: P. KOTIN, MD; T. STROEBEL

Subject: L.A. TALC

IN LINE WITH OUR CONVERSATION, BELOW IS OUTLINED A SURVEILLANCE PROGRAM TO ENSURE THE PROTECTION OF OUR L.A. TALC EMPLOYEES. WE UNDERSTAND THAT THIS IS AN INTERIM SITUATION AND THAT THE NECESSARY A.R. WILL BE APPROVED BY MAY 1, 1976, AND SHORTLY THEREAFTER WORK WILL BEGIN TO CORRECT THE SERIOUS ENVIRONMENTAL PROBLEMS AT L.A. TALC.

THE SURVEILLANCE PROGRAM SHOULD CONSIST OF AT LEAST ONE UN-ANNOUNCED INSPECTION PER WEEK PER SHIFT. A REPORT SHOULD BE ISSUED AND CERTIFIED BY THE INSPECTOR LISTING NAMES, EMPLOYEE NUMBERS, WORK STATIONS, TIME, ETC. IN ALL CASES WHERE AN EMPLOYEE IS NOT WEARING A RESPIRATORY PROTECTIVE DEVICE.

AS YOU KNOW, INTERIM MEASURES SUCH AS THE WEARING OF RESPIRATORY PROTECTIVE DEVICES OFFER A POOR SUBSTITUTE IN THE PROTECTION OF WORKERS SIMPLY BECAUSE THE WORKER HIMSELF IN MANY CASES WILL SHORT-CIRCUIT THE BEST INTENDED EFFORTS ON THE PART OF MANAGEMENT TO PROTECT HIM.

NO ADDITIONAL INDUSTRIAL HYGIENE SURVEYS WILL BE NECESSARY SINCE NO CHANGES HAVE BEEN MADE IN ANY OF THE DUST COLLECTION EQUIPMENT. WE WILL CONTINUE TO MONITOR THE INDUSTRIAL HYGIENE ASPECTS ON A REGULAR BASIS FROM OUR OWN SHOP.

WE ARE NOT REALLY CONCERNED WITH WHETHER THIS IS DONE BY SOMEONE APPOINTED FROM YOUR SHOP OR WHETHER WE SEEK AN OUTSIDE INSPECTOR TO DO THIS WORK. WE ARE, HOWEVER, VERY SERIOUS IN OUR ATTEMPTS TO RECEIVE AN ACCURATE PICTURE OF THE SITUATION IN THE PLANT. IN ANY EVENT, WHETHER THE INSPECTION IS DONE INTERNALLY OR EXTERNALLY, WE WILL MAKE PERIODIC SURPRISE VISITS FROM OUR OWN DEPARTMENT. I HAVE CHECKED WITH DR. KOTIN, AND HE HAS NO SPECIFIC NAMES OF FIRMS TO RECOMMEND. PERHAPS THOSE ENGINEERING FIRMS THAT YOU HAVE BEEN DEALING WITH MIGHT PROVIDE A SUITABLE INSPECTOR. HOWEVER, IN LIGHT OF YOUR PLANS TO PLACE ADDITIONAL SUPERVISION IN THIS PLANT, PERHAPS THIS PERSON WOULD BE WELL SUITED TO PERFORM THIS DUTY.

JIM, I CONCUR WITH YOUR THOUGHTS. (1) SINCE WE HAVE PURCHASED THE L.A. TALC OPERATION, NO SUBSTANTIAL CHANGES HAVE BEEN MADE ON THE ENVIRONMENTAL CONDITIONS AT THE LOCATION (THIS, IN SPITE OF THE FACT THAT MONEY WAS ORIGINALLY APPROPRIATED IN

J. FLETCHER
JAN. 9, 1975
PAGE 2

THE INITIAL PURCHASE PRICE TO DO THIS.) (2) ENOUGH TECHNOLOGY IS CURRENTLY AVAILABLE ON THE SHELF TO AT LEAST REDUCE THE FIBER LEVELS TO THE 2 F/CC LEVEL. I BELIEVE THAT SUFFICIENT TIME HAS BEEN ALLOWED IN THE PAST AND INCLUDING THE FIRST FOUR MONTHS OF 1976 TO MAKE AN ECONOMIC REVIEW AND SOME DECISIONS. IF THIS SITUATION CANNOT BE RESOLVED WITH A SIGNED A.R. AND A FIRM DATE FOR THE CONSTRUCTION START, THEN I MOST CERTAINLY WOULD URGE THAT THIS SUBSTANDARD OPERATION BE SHUT DOWN ONCE AND FOR ALL.

W. B. Reitze
W. B. REITZE

CRMCMAD-000826



Johns-Manville

DEC

Internal Correspondence

To: R. K. COMANN

Date: DEC. 22, 1975

From: W. B. REITZE

Copies: P. KOTIN, MD ✓

Subject: TALC OPERATIONS

I RECEIVED YOUR MEMO CONCERNING THE CHANGES OF PLANS FOR THE TALC OPERATIONS AND YOUR INTENTIONS TO PROCEED WITH THE NEEDED ENVIRONMENTAL CONTROLS FOR THE LOS ANGELES PLANT AND THE SHUT-DOWN OF THE DUNN OPERATION.

AS SOON AS YOU ARRIVE AT ANY DEFINITE PLANS, SUCH AS: WAS AN A.R. SIGNED, WHAT THE BEGINNING DATE FOR ACTUAL CONSTRUCTION TO START, AND WHAT THE ESTIMATED COMPLETION DATE IS FOR INSTALLATION OF ENVIRONMENTAL CONTROLS, COULD YOU PLEASE ADVISE. COULD YOU ALSO PLEASE SEND A COPY OF THE SIGNED A.R.

PLEASE ADVISE BY THE 15TH OF JANUARY SO THAT WE MAY REVISE OUR MONITORING SCHEDULE IF THIS SHOULD BE NEEDED. IN THE EVENT THAT THE DECISIONS HAVE NOT BEEN REACHED BY THIS TIME, COULD YOU PLEASE GIVE US AN IDEA OF WHEN A DECISION MAY BE REACHED.


W. B. REITZE

CRMC-MAD-000827



Johns-Manville

Internal Correspondence

To: W. B. Reitze - 4N

Date: November 19, 1975

From: R. K. Comann - 2S

Copies: M. Harris - 4W, P. Kotin, M.D. - 4N, J. M. Fletcher - 2S,
D. B. Tash - L. A., F & C

Subject: LOS ANGELES TALC PLANT
RE: YOUR LETTER DATED NOVEMBER 14, 1975

Upon receipt of your letter I immediately called Dan Tash, our L. A. Plant Manager, and read your letter over the telephone. I expressed my concern and asked Dan to check into this situation at once and to advise me. I have just received the following wire from Mr. Tash:

"In answer to Bill Reitze letter of 11/14/75 regarding his visit 11/13/75, I would like to let you know that I questioned the maintenance men involved and they all say that they had taken their respirators off to discuss the job they were doing. They were in the process of installing the 150 HP motor on VM2 moved from Dunn. This is a heavy motor and installation does required good coordination. On the part of the maintenance men, I would like to mention that I talked to Larry Schriver and he said he noticed during his recent survey that the maintenance men were very good in wearing their respirators. Larry Schriver did say that he thought some areas of the plant such as warehouse, shop and loading dock were below TLV but would not verify this until he has finished dust counts on samples taken during his survey. Until any given areas in the plant can be confirmed as below TLV, it has been made mandatory that all men wear respirators when in the plant buildings and ear plugs when working in designated noise areas. This means respirators must be worn by anyone visiting or working in the plant. Personnel found not complying with these rules can be terminated without further warning." D. B. Tash

Until a decision is made on whether or not we are going to spend the necessary funds to bring the L. A. Plant into E. C. requirements, every effort will be made by the Plant Manager to see that the plant housekeeping is as good as possible and that all employees wear protective devices as required in those areas above the TLV. We should point out that the present salaried supervisory staff at L. A. consists of the Plant

CRMC-MAD-000828

W. B. Reitze - 4N
November 19, 1975
Page 2

Manager only. The plant is operating 3 shifts, 5-7 days per week with only hourly Leadmen as "supervisors". We expect to reach a decision around the first of the year as to the future course of our West Coast Talc operations. At that time funds must be committed and additions made to our L. A. Plant staff in order to operate the plant properly on a long-term basis.

We will keep you advised. Thanks for your comments on your recent visit.

R. K. Comann 

CRMCMAD-000829



Johns-Manville

Internal Correspondence

To: R. K. COMANN

Date: NOV. 14, 1975

From: W. B. REITZE

Copies: P. KOTIN, MD; M. HARRIS; J. FLETCHER

Subject: VISIT TO L.A. TALC PLANT

ON NOVEMBER 13, WHILE ON OTHER BUSINESS IN LOS ANGELES, I DROPPED BY THE LOS ANGELES TALC PLANT FOR A VISIT. J. B. FANNING ACCOMPANIED ME.

THE HOUSEKEEPING WAS SOMEWHAT IMPROVED SINCE MY LAST VISIT. THE SWEEPER WAS IN ACTION AND THE FLOORS AND YARDS LOOKED SOMEWHAT BETTER THAN IN THE PAST.

WHILE THERE, I OBSERVED THE EMPLOYEES AND WHETHER THEY WERE WEARING THE REQUIRED RESPIRATORY AND HEARING PROTECTION. TWO MEN (SWEEPER DRIVER AND PV CLAY PACKER) WERE WEARING THEIR RESPIRATORS. THE 4-MAN MAINTENANCE CREW, HOWEVER, WERE NOT WEARING RESPIRATORS. AS SOON AS WE APPROACHED THEM, THEY IMMEDIATELY PULLED THEIR RESPIRATORS FROM AROUND THEIR NECKS AND PLACED THEM OVER THEIR MOUTHS AND NOSES. WHEN WE TURNED OUR BACKS TO LOOK AT OTHER AREAS OF THE PLANT, THEY PULLED THE RESPIRATORS OFF AND DID NOT PUT THEM BACK ON UNTIL WE REAPPEARED.

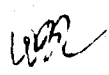
I MENTIONED THIS TO DAN TASH AND ATTEMPTED TO IMPRESS UPON HIM THE IMPORTANCE OF WEARING RESPIRATORY PROTECTIVE DEVICES. I MUST AGREE THAT THE WEARING OF RESPIRATORY PROTECTIVE DEVICES IN HOT, HUMID WEATHER WHEN PERFORMING STRENUOUS WORK IS EXTREMELY UNCOMFORTABLE; BUT NONE OF THIS ALTERS THE FACT THAT ENVIRONMENTAL CONDITIONS ARE SO POOR THAT PROTECTIVE DEVICES MUST BE WORN. IF IT IS DIFFICULT TO ENFORCE THE WEARING OF RESPIRATORY PROTECTIVE DEVICES DURING DAYTIME SHIFTS, I CAN ONLY SURMISE WHAT COMPLIANCE MUST BE LIKE ON THE TWO OFF-SHIFTS.

IF IT CAN BE DETERMINED IN THE NEXT FEW MONTHS FROM BOTH DAN TASH'S WEEKLY REPORTS AND OUR UNSCHEDULED VISITS THAT THE RESPIRATORY PROTECTIVE DEVICE REQUIREMENT IS NOT BEING COMPLIED WITH, I BELIEVE WE MUST VERY SERIOUSLY CONSIDER SHUTTING DOWN THE TALC OPERATIONS IN LOS ANGELES. MORALLY, WE CANNOT CONTINUE TO INJURE THE HEALTH OF OUR WORKERS; AND LEGALLY, WE CANNOT CONTINUE TO WILLFULLY DISREGARD FEDERAL AND STATE REGULATIONS. ASIDE FROM THE MORAL

CRMC-MAD-000830

R. K. COMANN
NOVEMBER 14, 1975
PAGE 2

ASPECTS, BOTH THE STATE AND FEDERAL GOVERNMENTS HAVE VERY SEVERE PENALTIES, INCLUDING JAIL SENTENCES FOR THOSE WHO WILLFULLY DISREGARD REGULATIONS. PLEASE KEEP ME INFORMED OF YOUR PROGRESS.


W. B. REITZE

CRMCMAD-000831

J. M. FLETCHER, 2-SOUTH

OCTOBER 29, 1975

PAUL KOTIN, M.D., 4-NORTH

M. HARRIS, 4-WEST

W. VANDERBEEK, 2-SOUTH

CONFIDENTIAL

REOPENING OF L.A. PLANT

YOUR MEMO OF OCTOBER 23 CLEARLY ILLUSTRATES THE DILEMMA FACING J-M. WHILE THE ECONOMIC ASPECTS OF THE TALC OPERATION CANNOT BE EXCLUDED IN ANY DELIBERATIONS RELATING TO HEALTH, SAFETY AND ENVIRONMENT IT IS IMPERATIVE THAT WE TAKE ALL NECESSARY ACTIONS TO ENSURE EMPLOYEE PROTECTION.

OUR POSITION ON THE REOPENING OF THE LOS ANGELES PLANT DEPENDS UPON THE MAINTENANCE OF A HAZARD-FREE ENVIRONMENT. TO ASSURE OURSELVES OF THIS WE PLAN TO (1) REVIEW THE WEEKLY REPORTS FROM THE PLANT ON EMPLOYEE USE OF RESPIRATORS; (2) SPOT-CHECK THE QUALITY OF HOUSEKEEPING AND SURVEY THE USE OF RESPIRATORS ON UNANNOUNCED VISITS; AND (3) MAKE UNANNOUNCED INDUSTRIAL HYGIENE MEASUREMENTS TO DETERMINE THE EFFECTIVENESS OF HOUSEKEEPING.

OUR CONCERN OVER THE J-M TALC OPERATION EXTENDS TO PENHORWOOD, AND WE ARE ANXIOUSLY AWAITING THE ENGINEERING REPORT FROM D. HILLMAN'S GROUP.

CRMC-MAD-000832

CONFIDENTIAL



Johns-Manville

15 D.K. Mr. Reiter has
seen + will
comment
Internal Correspondence

To: P. Kotin, M.D. - 4N

Date: Oct. 23, 1975

From: J. M. Fletcher - 2S

Copies:

Subject: REOPENING OF L.A. PLANT AND COMPLETE WESTERN TALC SITUATION

I can well appreciate your disappointment at once again operating this facility.

I would like to add a few comments. I am equally distressed at the complete situation. There are so many areas of endeavor which should be receiving attention and yet our efforts are continually diluted in trying to find a solution for Western Talc.

It has been reviewed and analyzed in detail. We know what has to be done to make it a proper operation but the sales forecasts and product prices just do not permit. The carrying charges are horrendous.

Attached is the latest list of alternatives prepared by Kent Comann. We are pushing Penhorwood as fast as we can. In the interim, we have been asked to supply the existing small Western Talc markets in order to maintain a marketing position. The product split is such that we cannot do it from only one location, even though total capacity is considerably under-utilized.

I can only assure you that one of my personal objectives is to get out from under this impossible and intolerable situation at the earliest date.

Attach.

CRMCMAD-000833

To: R. S. Lamar - 2W

Date: October 20, 1975

From: R. K. Comann - 2S

Copies: J. M. Fletcher - 2S, J. H. Swensen - 2W, J. P. Simpson - 2S,
H. R. Keefe - 2W, C. I. Keelan - 2W, F & CSubject: POSSIBLE PLANS - WEST COAST TALC
1976 CONTRACT PLAN

At our joint F & M and Mining Division meeting on the 1976 Contract Plan held October 7, it was decided to present possible divestment plans as a part of our 1976 program. I was requested to prepare various alternative possibilities and, after review by you, then our Division Controller could put down some numbers as to the effect on 1976 earnings with the various alternatives.

Briefly, here are the major alternatives as I see them for Western Talc in 1976:

1. Divest entire operation.
Assume a selling price of say \$2,000,000 to maximum of \$4,000,000 after Penhorwood comes on stream. (Still awaiting word from Cyprus--two other prospects turned us down.)
2. Divest Dunn Plant only when Penhorwood comes on stream.
Retain Warm Springs and L. A. Plant.
 - A. Assume selling price of Dunn at say \$200,000.
 - B. Assume L. A. can produce 45,000 tons/yr. - all products (15,000 tons fine grind).
 - C. Assume cost to fix up L. A. and Warm Springs for EC standards. Alpine production at L. A., bulk loading at L. A., underground mining at Warm Springs, etc. at \$400,000 - \$500,000.
3. Divest L. A. Plant only when Penhorwood comes on stream.
Retain Warm Springs and Dunn Plant.
 - A. Assume selling price of L. A. only at \$750,000.
 - B. Assume Dunn can produce 35,000 tons/yr. (7200 tons fine grind-with 3 vertical mill).
 - C. Assume cost to fix up Dunn and Warm Springs for EC standards, yard paving, warehouse, improve Dunn's efficiency, underground mining at Warm Springs, etc. at \$500,000 - \$600,000.

CRMC-MAD-000834

R. S. Lamar - 2W
October 20, 1975
Page 2

4. If no buyers can be found by the time Penhrowood is in production, then close down entire operation, sell plant equipment to used machinery dealers, or hold for possible future use within J-M at another location.
5. Another possibility that could be raised is to continue to operate Dunn and/or L.A. after Penhorwood is in operation without spending any major funds for improvements or EC work and to utilize all possible readily accessible ore at Warm Springs without major expenditures for resuming underground work. We could probably drag out such a plan during 1976. However, I would not recommend such a plan owing to the following considerations.
 - A. We have delayed long enough to fix up our talc plants as far as EC work and other improvements are concerned. This is understandable and acceptable until Penhorwood comes on stream, but I would not recommend continuing such an operation after Penhorwood is in operation.
 - B. Present talc plant salaried organization is not adequate to continue operations longer than the Penhorwood start-up. If we are to continue West Coast Talc operations after that, then I would want to make some major changes and improvements in the talc plants' salaried organization. We are short-handed now to adequately staff two talc plants but we will do the best we can until Penhorwood is in operation. We should keep in mind that our present salaried staff and probably the hourly personnel are generally aware of the fact that we may get rid of one or both of our plants. Naturally, this creates some morale problems.

In summary, if we keep operating after Penhorwood, we should spend considerable money to fix up our plants so that they can be clean, dust free, well run efficient operations with a strong and adequate staff having a degree of permanency.

6. The Federal Government could possibly shut down all mining in Death Valley if the pending bill is passed declaring a 3-year moratorium on all surface mining and surface disturbances in the Valley.

If you need further information, please let me know.

CRMC-MAD-000835

R. K. Comann



Johns-Manville

Internal Correspondence

To: D. B. Tash - L. A. Talc
D. E. Deem - Dunn

From: R. K. Comann - 2S

Copies: M. Harris - 4W, J. M. Fletcher - 2S, P. Kotin, M.D. - 4N,
W. B. Reitze - 4N, F & C

Subject: DUST PROBLEMS

Date: October 22, 1975

Per my previous discussions and letters, all of your employees are to wear respiratory protection when working in or around the plant where the dust is above the TLV. On October 7, D. B. Tash confirmed that this is being done at both locations and that signs have been posted to this effect. Employees not following these instructions will be terminated after proper warning and layoff.

To insure that these procedures are being followed, I will need from each of you a weekly report certifying over your signature that the employees are wearing the proper protective device. This report should show the name of each employee and his normal work area. This report need not take but a few minutes of your time each week to review and sign, but it will give us the insurance we must have that every employee is wearing the proper protective devices at all times.

This reporting procedure will continue until further notice. Please start with receipt of my letter. Mail your report on Friday of each week directly to me.

R. K. Comann



CRMC-MAD-000836

K. COMMAN, 25

OCTOBER 16, 1975

P. KOTIN, M.D., 4N

W. B. REITZE; M. HARRIS, 4N; J. FLETCHER, 2S
File

REOPENING OF L.A. TALC PLANT

I AM VERY DISTRESSED THAT WE WERE NOT CONSULTED BEFORE THE DECISION WAS MADE TO REOPEN THE L.A. TALC FACILITY. WE ARE ALL AWARE OF THE TOTALLY UNSATISFACTORY CONDITIONS THAT PREVAIL AT THE PLANT AND THAT THE LEVELS OF ASBESTOS FIBER (TREMOLITE) IN THE ENVIRONMENTAL WORK-PLACE EXCEED RECOMMENDED TLV'S BY, IN SOME CASES, A MAGNITUDE OF 10 TIMES

SINCE WORKERS ASSIGNED TO THIS LOCATION MUST WEAR RESPIRATORY PROTECTIVE DEVICES, I AM SUPPLEMENTING W. B. REITZE'S MEMO OF OCTOBER 7, 1975, TO YOU AND ASKING THAT A WEEKLY REPORT BE COMPLETED BY THE PLANT MANAGER CERTIFYING THAT EACH EMPLOYEE IS BEING FURNISHED WITH RESPIRATORY PROTECTION AND THAT THE PROTECTIVE DEVICES IS BEING WORN. THE WEEKLY REPORT SHOULD CONTAIN THE NAME OF THE INDIVIDUAL EMPLOYEE AND HIS WORK STATION. THESE REPORTS SHOULD CONTINUE UNTIL THE OPERATION IS ONCE AGAIN PHASED OUT.

CRMCMAD-000837

To: K. COMMAN —

Date: OCTOBER 7, 1975

From: W. B. REITZE

Copies: P. KOTIN, ✓ MD; J. FLETCHER

Subject: REOPENING OF LOS ANGELES TALC
ENVIRONMENTAL CONDITIONS AT ALL THREE TALC LOCATIONS

THIS WILL CONFIRM OUR RECENT CONVERSATION REGARDING THE ENVIRONMENTAL CONDITIONS AT DUNN AND WARM SPRINGS, AND YOUR STATEMENT THAT THE LOS ANGELES TALC PLANT WILL RE REOPENED THIS WEEK.

SINCE I THINK WE ARE ALL AGREED THAT ENVIRONMENTAL CONDITIONS ARE EXTREMELY BAD AT ALL THREE LOCATIONS, I AM GOING TO REQUEST THAT ALL EMPLOYEES AT ALL THREE LOCATIONS BE EQUIPPED WITH RESPIRATORY PROTECTION AND THAT IT BE MADE MANDATORY THAT THIS RESPIRATORY PROTECTION BE WORN AT ALL TIMES.

I AGREE THAT IT IS IMPRACTICAL TO SPEND MONEY WHEN THE OPERATION WILL BE PHASED OUT SHORTLY. HOWEVER, IN THE INTERVENING SIX, NINE OR TWELVE MONTHS, THE EMPLOYEES MUST BE AFFORDED SOME PROTECTION. IN YOUR NOTIFICATION TO THE LOCATIONS, REMIND THEM THAT IF THEY HAVE ANY QUESTIONS REGARDING TYPES OF RESPIRATORS TO BE USED, THEY ARE TO CONTACT THIS OFFICE.

WBR

W. B. REITZE

① I am distressed w/ management's
consulted or informed in advance of
decision

② I want detailed protocol of

own
Did hygiene procedures ~~compensating~~ ~~any~~ ~~plant~~ ~~malfunction~~
failure to contact

③ Weekly report of respirator

use



Johns-Manville

1975
Internal Correspondence

To: W. B. Reitze - 4N

Date: October 6, 1975

From: R. K. Comann - 2S

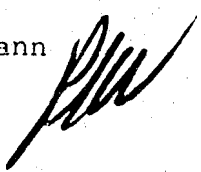
Copies: M. Harris - 4W, P. Kotin, MD-4N, J. M. Fletcher - 2S,
J. H. Swensen - 2W, D. B. Tash - LA, D. E. Deem - Dunn, F & C

Subject: L.A. AND DUNN TALC PLANTS

This will confirm my conversation with you today in which I advise that, due to increased sales forecast for fine grind products, it has been decided to re-open the L.A. Plant for a temporary period. This temporary period along with the continued operation of the Dunn Plant will probably extend until the new Penhorwood Plant comes on stream around March or April, 1976, depending on sales volume. When Penhorwood is in production, then a decision will be made on the future operations of Dunn and/or L. A. Plants. At that time, necessary major expenditures will have to be provided if it is decided to keep the Dunn and/or L. A. Plants open.

In the meantime, I have again instructed the local management of L. A. and Dunn Plants that respirators must be worn by all employees in areas over the TLV. If non-compliance, employees are to be terminated.

R. K. Comann



CRMC-MAD-000839

To: W. B. Reitze - 4N

Date: August 18, 1975

From: R. K. Comann - 2S

Copies: W. L. VanDerbeek - 2S, M. Harris - 4W, J. M. Fletcher - 2S,
J. H. Swensen - 2W, P. A. Martinson - 2W, P. Kotin, M.D. - 4N,
G. W. Wright, M.D. - 4N, F & C

Subject: TALC PLANS - LOS ANGELES AND DUNN
RE: YOUR LETTER AUGUST 5, 1975
MY LETTER AUGUST 4, 1975

The plans are to close down the L. A. Plant entirely as far as production of Talc and PV clay are concerned as of August 31, 1975. We will ship from remaining finished goods inventory at L. A. until inventory is sold.

Regarding Dunn, the Mining Division has made a divestment recommendation on Dunn and Warm Springs and we are now awaiting a review from the F & M Marketing Division. We expect a reply within a month or two, so that plans can be made accordingly.

We will keep you advised.

R. K. Comann

To: W. B. Reitze - Denver 4N

Date: August 4, 1975

From: R. K. Comann - Denver 2S

Copies: P. Kotin, M.D. - 4N
J. M. Fletcher - 2S

G. W. Wright, M.D. - 4N
Chrono/File

Subject: PLANS FOR LOS ANGELES TALC PLANT
RE: MY LETTER MAY 30, 1975
YOUR LETTER MAY 29, 1975

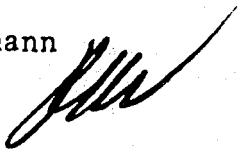
As a follow-up to my letter of May 30, it has been decided to shut down all Talc production at the Los Angeles plant as of August 31.

Production during August is being curtailed with only around 12 employees working at L.A.

The Dunn Plant is continuing in full operation, at least for the time being. A decision will be made shortly as to whether we will continue to operate Dunn and Warm Springs or divest. If it is decided to continue operations of the Dunn Plant, then major commitments will have to be made to bring this plant up to required E.C. standards. Also E.C. considerations would then be necessary for Warm Springs Mine when we go back underground next year.

I will continue to keep you advised.

R. K. Comann





Johns-Manville

JUN 02 1975

Internal Correspondence

To: W. B. Reitze - 4N

Date: May 30, 1975

From: R. K. Comann - 2S

Copies: P. Kotin, M.D. - 4N, G. W. Wright, M.D. - 4N, J. M. Fletcher - 2S,
F & C

Subject: FUTURE PLANS FOR L.A. TALC, DUNN AND WARM SPRINGS OPERATION
RE: YOUR LETTER DATED MAY 29, 1975

At the present time we are having our Controller prepare a profit analysis of both Los Angeles and Dunn Plants to see which plant should continue to produce Talc products. This analysis should be completed by July 1. Shortly thereafter a decision will be made as to which plant will continue to produce Talc products. It is planned to operate only one plant on Talc and possibly utilize the other mill on grinding other industrial minerals such as Calcium Carbonate (Calcite) or Barite. We will then request funds as soon as possible after July 1, to bring the one remaining Talc mill up to required environmental standards.

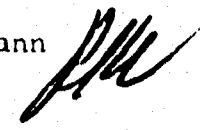
The mill operating on other industrial minerals will be analyzed for environmental needs when the type of minerals and operating requirements are determined.

As far as Warm Springs Mine is concerned, we plan to continue open-pit mining with an outside contract for the near term, up to perhaps a year. However, we are preparing a Mining Plan with the help of outside consultants that will very likely include going back underground, either in the old workings or perhaps a new area. One of the consultants we have contacted is a specialist in underground mining environmental control applications. We plan to discuss the situation with this person shortly and see how he can assist us in the environmental aspect of our Mining Plan. We expect to have our Mining Plan completed in July.

If you have any further questions, or can offer any suggestions on improving our plans, please let me know.

I will keep you advised as to our decision on the plans for our two mills and the mine.

R. K. Comann



CRMC-MAD-000842



Johns-Manville

MAY 29 1975
Internal Correspondence

To R. K. Comman

file
Date May 29, 1975

From W. B. Reitze

Copies P. Kotin, MD; G. W. Wright, MD

Subject FUTURE PLANS FOR L.A. TALC, DUNN, AND WARM SPRINGS OPERATIONS

Dr. George Wright has filled me in on your discussions relative to the future of the three locations mentioned above. Apparently at least at the time of his meeting with you, no firm plans had been decided upon.

As you know, we are very much concerned about the health problems at all three of these locations, and I would like to request that you inform me by June 16 regarding what the specific plans will be. It is important for us to be aware of future activities at these locations in order that we may complete our own plans for health and environmental control maintenance.

WBR
W. B. Reitze

CRMC-MAD-000843



Johns-Manville

JAN 16 1975

Internal Correspondence

To: R. K. Comann - 4S

Date: January 15, 1975

From: W. B. Reitze - 4N

Copies: Drs. P. Kotin & G. W. Wright; R. Riede

Subject: LOS ANGELES TALC

This memo will serve two purposes: (1) to confirm our recent conversation, and (2) to discuss the latest industrial hygiene report.

As I mentioned in our recent conversation, we are all aware of the economic facts at Los Angeles Talc. The operation has been only marginally profitable, and a rather large sum of money is needed to remedy all of the environmental problems at the plant (1/2 to 1 million dollars). We also realize that to make a decision to spend this large sum of money on a marginally profitable operation is indeed a tough decision.

But the fact still remains that workers are being exposed to levels of tremolitic talc far exceeding the Federal regulations. It is our opinion that workers at the Talc plant are being subjected to considerable health risks. Therefore, steps have to be taken immediately to remove these employees from risk.

We also discussed some of the temporary methods that you were putting into force immediately. The installation of a Hoffco vacuum system should help greatly to reduce the housekeeping problems and thereby prevent asbestos fibers from being reentrained into the ambient air. Your plans to temporarily make repairs and replacements in the existing dust collection system should help at least on an interim basis to reduce the fiber levels. The one program that must be reinforced is the respiratory protective device program. As it stands now, this program is not being rigidly enforced and workers are working in a high exposure area without respiratory protection (see attached Industrial Hygiene Survey results). We must not lose sight of the fact that a vital part of every respirator program is a respirator maintenance program as outlined by the ANSI Regulation Z88.2, 1969. If this respirator maintenance program becomes too burdensome, then I would recommend that we switch over to disposable respirators. These respirators can be used until they are loaded, which varies in time from several hours to several days. They cost about \$1.50, so it would be in my opinion cheaper for the plant to maintain adequate reusable respirator programs.

CRMC-MAD-000844

R. K. Comann
January 15, 1975
Page 2

All of these methods are only acceptable as interim solutions and will barely suffice as stop-gap methods. The decision to do a complete environmental cleanup or the alternative...shut the plant down...must be made at the earliest date possible.



W. B. Reitze

WBR/lh

Attach.

CRMC-MAD-000845

Environmental Control Department
Denver - GHQ
January 9, 1975

TO: D. B. Tash - Los Angeles Talc

FROM: G. L. Swallow - Denver 4N

COPIES: R. K. Comann - 4 South
L. A. Schriver - Lompoc
D. R. Christensen - R&D
W. B. Reitze - 4 North
File

SUBJECT: BIENNIAL INDUSTRIAL HYGIENE SURVEY - NOVEMBER 11-15, 1974
MINING DIVISION - LOS ANGELES TALC

Attached is the numerical recap and the All Stations List giving the results of the Los Angeles (Talc) Industrial Hygiene Survey conducted during the week of November 11th.

The majority of established dust stations (19 of 23 established) remain above TLV. With one exception, station D-4S, these stations were over TLV on the basis of airborne asbestos (tremolite) concentrations or combinations of tremolite and quartz levels. Station D-4S is above TLV strictly on the basis of a respirable gravimetric quartz exposure in mg/m³ (milligrams/cubic meter). The respirable gravimetric sampling technique has superseded the former impinger method which is currently being phased out. The respirable gravimetric procedure has been proposed by NIOSH as the method for evaluation of airborne quartz concentrations. In anticipation of this method becoming law, we are now using it as our criterion.

The following stations have exceeded the tremolite TLV consistently for every survey since the initial surveys of June and July, 1972; D-1M, D-2M, D-3M, D-5M, D-7M, D-8M, D-10M, D-11M, D-12M, D-13M, D-14M, D-15M, D-1S, D-2S, D-3S, D-5S, and D-7S. The only variation in results has been in terms of magnitude. Two examples of this situation appear below:

D-11M, No. 2 Raymond Mill Packer Operator

07/26/72	12.3 F/cc TWA
07/26/73	61.2 F/cc TWA
05/21/74	18.7 F/cc TWA
05/23/74	112.3 F/cc Peak
11/13/74	173.5 F/cc Peak

D-14M, G.A.S. - Mezzanine Floor (East of Alpine Packer

07/25/72	17.6 F/cc TWA
07/24/73	20.0 F/cc TWA
07/26/73	35.1 F/cc TWA
12/04/73	>2.0 F/cc TWA
12/06/73	>2.0 F/cc TWA
05/20/74	17.5 F/cc TWA
05/21/74	21.8 F/cc TWA
11/11/74	5.0 F/cc TWA
11/11/74	3.8 F/cc TWA

CRMC-MAD-000846

The hygienist's field notes emphasize several important points. Leaking equipment, inadequate ventilation capture velocities, and general poor design of the ventilation system, are the main contributors to the high dust levels encountered within the plant. Housekeeping efforts are good but are negated due to these unfavorable circumstances.

Please note that at several dust stations, (e.g. D-3M, D-1S, D-2S, D-3S), which are over TLV, no personal protection is being worn. In light of the continuing high dust levels, the immediate implementation of its use is a necessity.

Five noise stations were found to be above TLV. At two of these stations, no personal protective equipment is being worn; again, its immediate use should be implemented. The results are reported in accordance with the latest Federal OSHA practice. An excerpt from the Federal Register which deals with the subject of noise is attached. The actual noise levels measured at the stations above TLV follow:

N-3M	91 dBA
N-5M	95 to 98 dBA
N-6M	95 to 96 dBA
N-7M	93 to 94 dBA
N-8M	100, 101, 102, 103, and 112 dBA

The attached field notes give a good deal of detail regarding housekeeping and safety observations made during the survey.

The Industrial Hygienist made a number of housekeeping and safety suggestions to the plant manager. A summary of them is as follows:

1. Although housekeeping efforts in the Packer Area are good, the results are not. Inadequate ventilation and improper hood design results in extreme build-ups of dust throughout the area despite the clean-up procedures used.
2. In the Warehouse Area, the ambient air is generally and obviously dust-laden, the major contribution to this condition appears to be the Flex-Clean baghouse discharge and the No. 2 Raymond Mill Feed System.
3. Conditions in the warehouse affect the boxcar loading operation resulting in a highly variable and frequently concentrated dust exposure to the operator loading railroad cars.

A number of instances where inadequate maintenance causes or contributes to dust exposures are:

1. Bauer Mill Area -

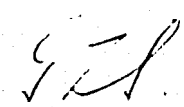
- a. Leaking seals on No. 1 Hurricane Feed Screen
- b. The product discharge from the No. 1 Hurricane Mill
- c. The product discharge from the No. 2 Hurricane Mill
- d. The product discharge from the Screw Conveyor following the Centrifugal Mill.
- e. The product discharge from the No. 4 Hurricane Mill
- f. Leaking flanges on the discharge from the No. 6 Hurricane Mill to the No. 6 Flex-Clean Baghouse.

2. No. 1 Raymond Mill - There is no effective ventilation on the elevator at this location, because two gates were in the closed position between the elevator and the dust collecting unit.

3. The Quality Control Lab - The exhaust hood moves very little air, resulting in visible dust during mixing operations and settled dust on laboratory equipment.

Suggestions for corrective measures in general call for improved dust control and ventilation throughout the plant. It is my understanding that proposals have been made by the Air Engineering Group, but that to date, no monies have been approved. No substantial progress can be made until such time as an adequate system is installed. In the meantime, the installation of gaskets where needed, skirting along belt conveyors, a low level Bindiicator to minimize dust emissions from the No. 2 Raymond Mill Surge Bin, a Braking Device to eliminate backward movement of the conveyor associated with the Raymond Mill Surge Bin, and improving various local exhaust systems, will effect improvements in certain specific areas.

In the area of safety, it was noted and reported that there is a stumbling hazzard on the center support (at floor level) of the baghouse.


G. L. Swallow

KJW:GLS/jmb
Attachments

-CONFIDENTIAL-

Denver Industrial Hygiene Laboratory
R&D Center
Date December 12, 1974

Plant Manager D. B. Tash

BIENNIAL INDUSTRIAL HYGIENE SURVEY
DIVISION Mining PLANT Los Angeles (Talc)

Following is a summary of the Industrial Hygiene Survey conducted
November 11, 1974.

1. The following stations which were previously over TLV are
below TLV in the current survey:

N-1M, N-2M, N-10M

2. The following stations were not operating during the current
survey:

D-9M, D-6S, N-4M

3. The following stations were found to be over TLV in the current
survey:

D-1M, D-2M, D-3M, D-5M, D-6M, D-7M, D-8M, D-10M, D-11M, D-12M,

D-13M, D-14M, D-15M, D-1S, D-2S, D-3S, D-5S, D-7S, N-3M, N-5M,

N-6M, N-7M, N-8M, V-2S, D-4S

4. Total number of established
sampling stations.
5. Number of stations sampled
during current survey.
6. Number of surveyed stations
above TLV.

ALL DUST	*	NOISE	F/V	TOTAL	ASB. ONLY
23	-	11	2	36	23
21	-	10	2	33	21
19	-	5	1	25	19

*CDCA - Cleaned Dust Control Air

D. R. Christensen
D. R. Christensen
Industrial Hygienist

CRMC-MAD-000849

cc: Manager, OEC

DATE December 12, 1974
 BIENNIAL INDUSTRIAL HYGIENE SURVEY
 ALL STATIONS
 Los Angeles

DIVISION Mining PLANT (Talc) SURVEY DATE 11/11/74

OCCUPATIONAL DUST

STATION NO.	STATION DESCRIPTION	HAZARD	TLV	CURRENT SURVEY RESULT
D-1M	Box Car Crude Unloading Operator	Tremolitic Asbestos	10.0	(15.5 F/cc)
		Tremolitic Asbestos	10.0	(38.2 F/cc)
		4% Quartz	1.67	1.51 mg/m ³
D-2M	General Area Sample - Crusher Building, 2nd Floor	Tremolitic Asbestos	2.0	3.0 F/cc
		Tremolitic Asbestos	2.0	1.5 F/cc
		Tremolitic Asbestos	10.0	(1.7 F/cc)
		4% Quartz	1.67	0.68 mg/m ³
D-3M	General Area Sample - Incline & Shuttle Conveyor Area (To Storage Bins)	Tremolitic Asbestos	10.0	(28.8 F/cc)*
		4% Quartz	1.67	1.37 mg/m ³ *
D-4M	General Area Sample - Rear Yard (East of Mill Building)	Tremolitic Asbestos	2.0	1.2 F/cc*
		Tremolitic Asbestos	2.0	0.4 F/cc*
		16% Quartz	0.56	0.00 mg/m ³ *
D-5M	General Area Sample - South Side of Building (Bauer Equipment Area)	Tremolitic Asbestos	2.0	1.1 F/cc
		Tremolitic Asbestos	2.0	7.1 F/cc
		16% Quartz	0.56	2.02 mg/m ³
D-6M	General Area Sample - Storage Yard (North of Mill Building)	Tremolitic Asbestos	2.0	2.1 F/cc*
		Tremolitic Asbestos	2.0	2.1 F/cc*
		6% Quartz	0.56	0.02 mg/m ³ *

DNO - Did Not Operate CRMC-MAD-000850

- Above TLV

* - Personal Protective Equipment Not Worn

() - Peak Exposure

DATE December 12, 1974
 BIENNIAL INDUSTRIAL HYGIENE SURVEY
 ALL STATIONS
 Los Angeles

DIVISION Mining PLANT (Talc) SURVEY DATE 11/11/74

OCCUPATIONAL DUST

STATION NO.	STATION DESCRIPTION	HAZARD	TLV	CURRENT SURVEY RESULT
D-7M	General Area Sample - Under Crude Storage Bins	Tremolitic Asbestos	10.0	(21.0 F/cc)
		Tremolitic Asbestos	2.0	1.3 F/cc
		16% Quartz	0.56	2.72 mg/m ³
D-8M	No. 1 Raymond Mill Packer Operator	Tremolitic Asbestos	2.0	5.9 F/cc
		Tremolitic Asbestos	2.0	12.2 F/cc
		16% Quartz	0.56	0.36 mg/m ³
D-9M	Alpine Packer Operator	Tremolitic Asbestos	DNO	--
D-10M	Nos. 1 & 2 Vertical Mills Packer Operator	Tremolitic Asbestos	2.0	3.1 F/cc
		Tremolitic Asbestos	2.0	6.5 F/cc
		16% Quartz	0.56	1.41 mg/m ³
D-11M	No. 2 Raymond Mill Packer Operator	Tremolitic Asbestos	10.0	(173.5 F/cc)
		16% Quartz	0.56	5.38 mg/m ³
D-12M	Bauer Hurricane Mills & Centrisonic Packer Operator	Tremolitic Asbestos	2.0	3.1 F/cc
		Tremolitic Asbestos	2.0	6.4 F/cc
		16% Quartz	0.56	1.05 mg/m ³
D-13M	General Area Sample - Electrical Control Panels East End of Building	Tremolitic Asbestos	2.0	18.8 F/cc
		Tremolitic Asbestos	10.0	(8.3 F/cc)
		16% Quartz	0.56	5.19 mg/m ³

DNO - Did Not Operate

○ - Above TLV

* - Personal Protective Equipment Not Worn

() - Peak Exposure

CRMC-MAD-000851

DATE December 12, 1974
 BIENNIAL INDUSTRIAL HYGIENE SURVEY
 ALL STATIONS
 Los Angeles

DIVISION Mining PLANT (Talc) SURVEY DATE 11/11/74

OCCUPATIONAL DUST

STATION NO.	STATION DESCRIPTION	HAZARD	TLV	CURRENT SURVEY RESULT
D-14M	General Area Sample - Mezzanine Floor (East of Alpine Packer)	Tremolitic Asbestos Tremolitic Asbestos 16% Quartz	 2.0 2.0 0.56	 5.0 F/cc 3.8 F/cc 2.40 mg/m ³
D-15M	Mill Crew Leader	Tremolitic Asbestos Tremolitic Asbestos 16% Quartz	 2.0 2.0 0.56	 8.8 F/cc 16.7 F/cc 1.67 mg/m ³
D-16M	General Room Sample - Lunch Room	Tremolitic Asbestos Tremolitic Asbestos Tremolitic Asbestos	 2.0 10.0 2.0 10.0	 0.4 F/cc* (1.8 F/cc)* 0.6 F/cc* (1.0 F/cc)*
D-1S	General Area Sample - Shop Area	Tremolitic Asbestos Tremolitic Asbestos 16% Quartz	 2.0 2.0 0.56	 5.7 F/cc* 15.2 F/cc* 0.85 mg/m ³ *
D-2S	General Area Sample - Warehouse (West End of Building)	Tremolitic Asbestos Tremolitic Asbestos 6% Quartz	 2.0 2.0 1.25	 6.2 F/cc* 12.6 F/cc* 0.55 mg/m ³
D-3S	Loader - Loading R. R. Box Car	Tremolitic Asbestos Tremolitic Asbestos 6% Quartz	 2.0 2.0 1.25	 4.0 F/cc* 35.8 F/cc* 0.33 mg/m ³ *
D-4S	Oiler	Tremolitic Asbestos 16% Quartz	 10.0 0.56	 (5.3 F/cc) 7.23 mg/m ³

DNO - Did Not Operate

C - Above TLV

* - Personal Protective Equipment Not Worn

() - Not Reported

CRMC-MAD-000852

DATE December 12, 1974
 BIENNIAL INDUSTRIAL HYGIENE SURVEY
 ALL STATIONS
 Los Angeles

DIVISION Mining PLANT (Talc) SURVEY DATE 11/11/74

NOISE

<u>STATION NO.</u>	<u>STATION DESCRIPTION</u>	<u>HAZARD</u>	<u>TLV</u>	<u>CURRENT SURVEY RESULT</u>
<u>D-5S</u>	Maintainer	Tremolitic Asbestos	2.0	6.6 F/cc
		Tremolitic Asbestos	10.0	(27.8 F/cc)
		Tremolitic Asbestos	10.0	(20.4 F/cc)
		16% Quartz	0.56	0.31 mg/m ³
D-6S	General Area Sample - Bulk Loading Station (West of Building)	Tremolitic Asbestos	DNO	---
<u>D-7S</u>	General Room Sample - Quality Control Lab	Tremolitic Asbestos	2.0	3.5 F/cc
		Tremolitic Asbestos	2.0	11.8 F/cc

DNO - Did Not Operate

() - Above TLV

* - Personal Protective Equipment Not Worn

() - Peak Exposure

CRMC-MAD-000853

DATE December 12, 1974
 BIENNIAL INDUSTRIAL HYGIENE SURVEY
 ALL STATIONS

DIVISION Mining PLANT Los Angeles
(Talc) SURVEY DATE 11/11/74

NOISE

STATION NO.	STATION DESCRIPTION	HAZARD	TLV	CURRENT SURVEY RESULT
N-1M	Front End Loader Operator	Noise	1.0	< 1.0 *
N-2M	Crusher Building, 2nd Floor	Noise	1.0	< 1.0 *
N-3M	No. 1 Raymond Mill Packer Operator	Noise	1.0	1.17
N-4M	Alpine Packer Operator	Noise	DNO	----
N-5M	Nos. 1 & 2 Vertical Mills Packer Operator	Noise	1.0	2.17
N-6M	No. 2 Raymond Mill Packer Operator	Noise	1.0	1.77 *
N-7M	Bauer Hurricane Mills & Centrisonic Packer Operator	Noise	1.0	1.57
N-8M	South side of Building (Bauer Equipment Area)	Noise	1.0	8.00 *
N-9M	Mill Crew Leader	Noise	1.0	< 1.0
N-10M	Fork Lift Operator	Noise	1.0	< 1.0
N-1S	Shop Area	Noise	1.0	< 1.0 *

DNO - Did Not Operate

() - Above TLV

* - Personal Protective Equipment Not Worn

() - Peak Exposre

CRMC-MAD-000854

DATE December 12, 1974
BIENNIAL INDUSTRIAL HYGIENE SURVEY
ALL STATIONSDIVISION Mining PLANT Los Angeles
(Talc) SURVEY DATE 11/11/74NOISE

<u>STATION NO.</u>	<u>STATION DESCRIPTION</u>	<u>HAZARD</u>	<u>TLV</u>	<u>CURRENT SURVEY RESULT</u>
V-1S	General Area Sample - Warehouse	Carbon Monoxide	50.0 ppm	10.0 ppm*
		Carbon Monoxide	50.0 ppm	10.0 ppm*
		Carbon Monoxide	50.0 ppm	11.0 ppm*
V-2S	Loading R. R. Box Car	Carbon Monoxide	50.0 ppm	130.0 ppm
		Carbon Monoxide	50.0 ppm	120.0 ppm
		Carbon Monoxide	50.0 ppm	10.0 ppm

DNO - Did Not Operate

() - Above TLV

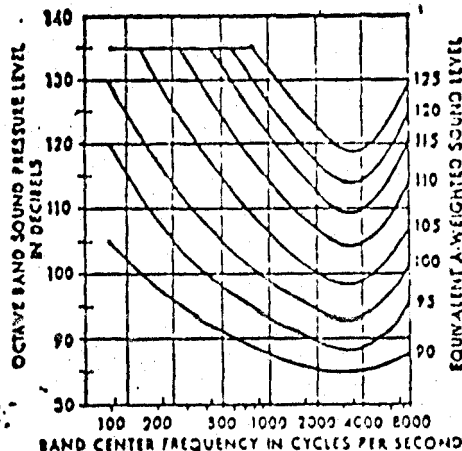
* - Personal Protective Equipment Not Worn

() - Peak Exposure

CRMC-MAD-000855

noise exposure shall be provided when the sound levels exceed those shown in Table G-16 when measured on the A scale of a standard sound level meter at slow response. When noise levels are determined by octave band analysis, the equivalent A-weighted sound level may be determined as follows:

Figure G-3



Equivalent sound level contours. Octave band sound pressure levels may be converted to the equivalent A-weighted sound level by plotting them on this graph and noting the A-weighted sound level corresponding to the point of highest penetration into the sound level contours. This equivalent A-weighted sound level, which may differ from the actual A-weighted sound level of the noise, is used to determine exposure limits from Table G-16.

(b) (1) When employees are subjected to sound exceeding those listed in Table G-16, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels within the levels of Table G-16, personal protective equipment shall be provided and used to reduce sound levels within the levels of the table.

(2) If the variations in noise level involve maxima at intervals of 1 second or less, it is to be considered continuous.

(3) In all cases where the sound levels exceed the values shown herein, a continuing, effective hearing conservation program shall be administered.

Table G-16—PERMISSIBLE NOISE EXPOSURES¹

Duration per day, hours	Sound level dBA slow response
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
½	110
¼ or less	115

¹When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions: $C_1/T_1 + C_2/T_2 + C_n/T_n$ exceeds unity, then, the mixed exposure should be considered to exceed the limit value. C_n indicates the total time of exposure at a specified noise level, and T_n indicates the total time of exposure permitted at that level.

Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
WASHINGTON, D.C. 20310



Office of the Assistant Secretary

OCT 9 1974

Mr. H. B. Vanderbilt
President
Chief Executive Officer
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 06855

Dear Mr. Vanderbilt:

This is in reply to your letter of September 26, concerning your request for relief from the asbestos standard for your talcs containing non-fibrous tremolite, actinolite, and anthophyllite.

My letter of August 6 stated that non-fibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the asbestos standard and, therefore, the provisions of that standard do not apply to talc containing non-asbestiform minerals.

NIOSH is currently conducting a thorough investigation into the exact minerals to which talc workers were exposed in those studies where asbestosis or other adverse medical effects were found.

Pending the receipt and evaluation by OSHA of the report by NIOSH on this investigation, if you have scientific evidence that the naturally occurring talcs, prior to processing by milling or crushing, do not contain fibrous or asbestiform tremolite, anthophyllite, actinolite or other asbestiform minerals, you may certify to your customers that the talc does not contain asbestos.

Fibrous, asbestiform minerals such as fibrous tremolite means naturally occurring asbestiform minerals which prior to or after crushing and processing, contain fibers made up of fibrils.

Sincerely,

A handwritten signature in cursive script, reading "John H. Stender", is written over the typed name.

John H. Stender
Assistant Secretary of Labor

CRMC-MAD-000857

file

Environmental Control Department
Denver - GHQ
January 9, 1975

TO: D. B. Tash - Los Angeles Talc

FROM: G. L. Swallow - Denver 4N

COPIES: R. K. Comann - 4 South
L. A. Schriver - Lompoc
D. R. Christensen - R&D
W. B. Reitze - 4 North
File

SUBJECT: BIENNIAL INDUSTRIAL HYGIENE SURVEY - NOVEMBER 11-15, 1974
MINING DIVISION - LOS ANGELES TALC

Attached is the numerical recap and the All Stations List giving the results of the Los Angeles (Talc) Industrial Hygiene Survey conducted during the week of November 11th.

The majority of established dust stations (19 of 23 established) remain above TLV. With one exception, station D-4S, these stations were over TLV on the basis of airborne asbestos (tremolite) concentrations or combinations of tremolite and quartz levels. Station D-4S is above TLV strictly on the basis of a respirable gravimetric quartz exposure in mg/m³ (milligrams/cubic meter). The respirable gravimetric sampling technique has superseded the former impinger method which is currently being phased out. The respirable gravimetric procedure has been proposed by NIOSH as the method for evaluation of airborne quartz concentrations. In anticipation of this method becoming law, we are now using it as our criterion.

The following stations have exceeded the tremolite TLV consistently for every survey since the initial surveys of June and July, 1972; D-1M, D-2M, D-3M, D-5M, D-7M, D-8M, D-10M, D-11M, D-12M, D-13M, D-14M, D-15M, D-1S, D-2S, D-3S, D-5S, and D-7S. The only variation in results has been in terms of magnitude. Two examples of this situation appear below:

D-11M, No. 2 Raymond Mill Packer Operator

07/26/72	12.3 F/cc TWA
07/26/73	61.2 F/cc TWA
05/21/74	18.7 F/cc TWA
05/23/74	112.3 F/cc Peak
11/13/74	173.5 F/cc Peak

D-14M, G.A.S. - Mezzanine Floor (East of Alpine Packer)

07/25/72	17.6 F/cc TWA
07/24/73	20.0 F/cc TWA
07/26/73	35.1 F/cc TWA
12/04/73	>2.0 F/cc TWA
12/06/73	>2.0 F/cc TWA
05/20/74	17.5 F/cc TWA
05/21/74	21.8 F/cc TWA
11/11/74	5.0 F/cc TWA
11/11/74	3.8 F/cc TWA

CRMC-MAD-000858

BIENNIAL INDUSTRIAL HYGIENE SURVEY - NOVEMBER 11-14, 1974
MINING DIVISION - LOS ANGELES TALC
January 9, 1975
Page Two

The hygienist's field notes emphasize several important points. Leaking equipment, inadequate ventilation capture velocities, and general poor design of the ventilation system, are the main contributors to the high dust levels encountered within the plant. Housekeeping efforts are good but are negated due to these unfavorable circumstances.

Please note that at several dust stations, (e.g. D-3M, D-1S, D-2S, D-3S), which are over TLV, no personal protection is being worn. In light of the continuing high dust levels, the immediate implementation of its use is a necessity.

Five noise stations were found to be above TLV. At two of these stations, no personal protective equipment is being worn; again, its immediate use should be implemented. The results are reported in accordance with the latest Federal OSHA practice. An excerpt from the Federal Register which deals with the subject of noise is attached. The actual noise levels measured at the stations above TLV follow:

N-3M	91 dBA
N-5M	95 to 98 dBA
N-6M	95 to 96 dBA
N-7M	93 to 94 dBA
N-8M	100, 101, 102, 103, and 112 dBA

The attached field notes give a good deal of detail regarding housekeeping and safety observations made during the survey.

The Industrial Hygienist made a number of housekeeping and safety suggestions to the plant manager. A summary of them is as follows:

1. Although housekeeping efforts in the Packer Area are good, the results are not. Inadequate ventilation and improper hood design results in extreme build-ups of dust throughout the area despite the clean-up procedures used.
2. In the Warehouse Area, the ambient air is generally and obviously dust-laden, the major contribution to this condition appears to be the Flex-Clean baghouse discharge and the No. 2 Raymond Mill Feed System.
3. Conditions in the warehouse affect the boxcar loading operation resulting in a highly variable and frequently concentrated dust exposure to the operator loading railroad cars.

A number of instances where inadequate maintenance causes or contributes to dust exposures are:

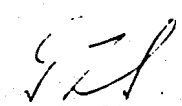
1. Bauer Mill Area -
 - a. Leaking seals on No. 1 Hurricane Feed Screen
 - b. The product discharge from the No. 1 Hurricane Mill
 - c. The product discharge from the No. 2 Hurricane Mill
 - d. The product discharge from the Screw Conveyor following the Centrifugal Mill.
 - e. The product discharge from the No. 4 Hurricane Mill
 - f. Leaking flanges on the discharge from the No. 6 Hurricane Mill to the No. 6 Flex-Clean Baghouse.

2. No. 1 Raymond Mill - There is no effective ventilation on the elevator at this location, because two gates were in the closed position between the elevator and the dust collecting unit.

3. The Quality Control Lab - The exhaust hood moves very little air, resulting in visible dust during mixing operations and settled dust on laboratory equipment.

Suggestions for corrective measures in general call for improved dust control and ventilation throughout the plant. It is my understanding that proposals have been made by the Air Engineering Group, but that to date, no monies have been approved. No substantial progress can be made until such time as an adequate system is installed. In the meantime, the installation of gaskets where needed, skirting along belt conveyors, a low level Bindiicator to minimize dust emissions from the No. 2 Raymond Mill Surge Bin, a Braking Device to eliminate backward movement of the conveyor associated with the Raymond Mill Surge Bin, and improving various local exhaust systems, will effect improvements in certain specific areas.

In the area of safety, it was noted and reported that there is a stumbling hazzard on the center support (at floor level) of the baghouse.


G. L. Swallow

KJW:GLS/jmb
Attachments

-CONFIDENTIAL-

Denver Industrial Hygiene Laboratory
R&D Center
Date December 12, 1974

Plant Manager D. B. Tash

BIENNIAL INDUSTRIAL HYGIENE SURVEY
DIVISION Mining PLANT Los Angeles (Talc)

Following is a summary of the Industrial Hygiene Survey conducted
November 11, 1974.

1. The following stations which were previously over TLV are
below TLV in the current survey:

N-1M, N-2M, N-10M

2. The following stations were not operating during the current
survey:

D-9M, D-6S, N-4M

3. The following stations were found to be over TLV in the current
survey:

D-1M, D-2M, D-3M, D-5M, D-6M, D-7M, D-8M, D-10M, D-11M, D-12M,

D-13M, D-14M, D-15M, D-1S, D-2S, D-3S, D-5S, D-7S, N-3M, N-5M,

N-6M, N-7M, N-8M, V-2S, D-4S

4. Total number of established
sampling stations.
5. Number of stations sampled
during current survey.
6. Number of surveyed stations
above TLV.

ALL DUST	*	NOISE	F/V	TOTAL	ASE. ONLY
23	-	11	2	36	23
21	-	10	2	33	21
19	-	5	1	25	19

*CDCA - Cleaned Dust Control Air

D. R. Christensen /S/H

D. R. Christensen
Industrial Hygienist

cc: Manager, OEC

CRMC-MAD-000861

DATE December 12, 1974
 BIENNIAL INDUSTRIAL HYGIENE SURVEY
 ALL STATIONS
 Los Angeles

DIVISION Mining PLANT (Talc) SURVEY DATE 11/11/74

OCCUPATIONAL DUST

STATION NO.	STATION DESCRIPTION	HAZARD	TLV	CURRENT SURVEY RESULT
D-1M	Box Car Crude Unloading Operator	Tremolitic Asbestos	10.0	(15.5 F/cc)
		Tremolitic Asbestos	10.0	(38.2 F/cc)
		4% Quartz	1.67	1.51 mg/m ³
D-2M	General Area Sample - Crusher Building, 2nd Floor	Tremolitic Asbestos	2.0	3.0 F/cc
		Tremolitic Asbestos	2.0	1.5 F/cc
		Tremolitic Asbestos	10.0	(1.7 F/cc)
		4% Quartz	1.67	0.68 mg/m ³
D-3M	General Area Sample - Incline & Shuttle Conveyor Area (To Storage Bins)	Tremolitic Asbestos	10.0	(28.8 F/cc)*
		4% Quartz	1.67	1.37 mg/m ³ *
D-4M	General Area Sample - Rear Yard (East of Mill Building)	Tremolitic Asbestos	2.0	1.2 F/cc*
		Tremolitic Asbestos	2.0	0.4 F/cc*
		16% Quartz	0.56	0.00 mg/m ³ *
D-5M	General Area Sample - South Side of Building (Bauer Equipment Area)	Tremolitic Asbestos	2.0	1.1 F/cc
		Tremolitic Asbestos	2.0	7.1 F/cc
		16% Quartz	0.56	2.02 mg/m ³
D-6M	General Area Sample - Storage Yard (North of Mill Building)	Tremolitic Asbestos	2.0	2.1 F/cc*
		Tremolitic Asbestos	2.0	2.1 F/cc*
		16% Quartz	0.56	0.02 mg/m ³ *

DNO - Did Not Operate

○ - Above TLV

* - Personal Protective Equipment Not Worn

DATE December 12, 1974
 BIENNIAL INDUSTRIAL HYGIENE SURVEY
 ALL STATIONS
 Los Angeles

DIVISION Mining PLANT (Talc) SURVEY DATE 11/11/74

OCCUPATIONAL DUST

STATION NO.	STATION DESCRIPTION	HAZARD	TLV	CURRENT SURVEY RESULT
D-7M	General Area Sample - Under Crude Storage Bins	Tremolitic Asbestos	10.0	(21.0 F/cc)
		Tremolitic Asbestos	2.0	1.3 F/cc
		16% Quartz	0.56	2.72 mg/m ³
D-8M	No. 1 Raymond Mill Packer Operator	Tremolitic Asbestos	2.0	5.9 F/cc
		Tremolitic Asbestos	2.0	12.2 F/cc
		16% Quartz	0.56	0.36 mg/m ³
D-9M	Alpine Packer Operator	Tremolitic Asbestos	DNO	--
D-10M	Nos. 1 & 2 Vertical Mills Packer Operator	Tremolitic Asbestos	2.0	3.1 F/cc
		Tremolitic Asbestos	2.0	6.5 F/cc
		16% Quartz	0.56	1.41 mg/m ³
D-11M	No. 2 Raymond Mill Packer Operator	Tremolitic Asbestos	10.0	(173.5 F/cc)
		16% Quartz	0.56	5.38 mg/m ³
D-12M	Bauer Hurricane Mills & Centrisonic Packer Operator	Tremolitic Asbestos	2.0	3.1 F/cc
		Tremolitic Asbestos	2.0	6.4 F/cc
		16% Quartz	0.56	1.05 mg/m ³
D-13M	General Area Sample - Electrical Control Panels East End of Building	Tremolitic Asbestos	2.0	18.8 F/cc
		Tremolitic Asbestos	10.0	(8.3 F/cc)
		16% Quartz	0.56	5.19 mg/m ³

DNO - Did Not Operate

- Above TLV

* - Personal Protective Equipment Not Worn

() - Peak Exposure

CRMC-MAD-000863

DATE December 12, 1974
 BIENNIAL INDUSTRIAL HYGIENE SURVEY

ALL STATIONS

Los Angeles

DIVISION Mining PLANT (Talc) SURVEY DATE 11/11/74

OCCUPATIONAL DUST

STATION NO.	STATION DESCRIPTION	HAZARD	TLV	CURRENT SURVEY RESULT
D-14M	General Area Sample - Mezzanine Floor (East of Alpine Packer)	Tremolitic Asbestos Tremolitic Asbestos 16% Quartz	2.0 2.0 0.56	5.0 F/cc 3.8 F/cc 2.40 mg/m ³
D-15M	Mill Crew Leader	Tremolitic Asbestos Tremolitic Asbestos 16% Quartz	2.0 2.0 0.56	8.8 F/cc 16.7 F/cc 1.67 mg/m ³
D-16M	General Room Sample - Lunch Room	Tremolitic Asbestos Tremolitic Asbestos Tremolitic Asbestos	2.0 10.0 2.0 10.0	0.4 F/cc* (1.8 F/cc)* 0.6 F/cc* (1.0 F/cc)*
D-1S	General Area Sample - Shop Area	Tremolitic Asbestos Tremolitic Asbestos 16% Quartz	2.0 2.0 0.56	5.7 F/cc* 15.2 F/cc* 0.85 mg/m ³ *
D-2S	General Area Sample - Warehouse (West End of Building)	Tremolitic Asbestos Tremolitic Asbestos 6% Quartz	2.0 2.0 1.25	6.2 F/cc* 12.6 F/cc* 0.55 mg/m ³
D-3S	Loader - Loading R. R. Box Car	Tremolitic Asbestos Tremolitic Asbestos 6% Quartz	2.0 2.0 1.25	4.0 F/cc* 35.8 F/cc* 0.33 mg/m ³ *
D-4S	Oiler	Tremolitic Asbestos 16% Quartz	10.0 0.56	(5.3 F/cc) 7.23 mg/m ³

DNO - Did Not Operate

() - Above TLV

* - Personal Protective Equipment Not Worn

CRMC-MAD-000864

DATE December 12, 1974
 BIENNIAL INDUSTRIAL HYGIENE SURVEY
 ALL STATIONS
 Los Angeles

DIVISION Mining PLANT (Talc) SURVEY DATE 11/11/74

NOISE

STATION NO.	STATION DESCRIPTION	HAZARD	TLV	CURRENT SURVEY RESULT
<u>D-5S</u>	Maintainer	Tremolitic Asbestos	2.0	6.6 F/cc
		Tremolitic Asbestos	10.0	(27.8 F/cc)
		Tremolitic Asbestos	10.0	(20.4 F/cc)
		16% Quartz	0.56	0.31 mg/m ³
D-6S	General Area Sample - Bulk Loading Station (West of Building)	Tremolitic Asbestos	DNO	---
<u>D-7S</u>	General Room Sample - Quality Control Lab	Tremolitic Asbestos	2.0	3.5 F/cc
		Tremolitic Asbestos	2.0	11.8 F/cc

DNO - Did Not Operate

 - Above TLV

* - Personal Protective Equipment Not Worn

() - Peak Exposure

CRMC-MAD-000865

DATE December 12, 1974
 BIENNIAL INDUSTRIAL HYGIENE SURVEY
 ALL STATIONS

DIVISION Mining PLANT Los Angeles
(Talc) SURVEY DATE 11/11/74

NOISE

STATION NO.	STATION DESCRIPTION	HAZARD	TLV	CURRENT SURVEY RESULT
N-1M	Front End Loader Operator	Noise	1.0	< 1.0 *
N-2M	Crusher Building, 2nd Floor	Noise	1.0	< 1.0 *
(N-3M)	No. 1 Raymond Mill Packer Operator	Noise	1.0	1.17
N-4M	Alpine Packer Operator	Noise	DNO	----
(N-5M)	Nos. 1 & 2 Vertical Mills Packer Operator	Noise	1.0	2.17
(N-6M)	No. 2 Raymond Mill Packer Operator	Noise	1.0	1.77 *
(N-7M)	Bauer Hurricane Mills & Centrisonic Packer Operator	Noise	1.0	1.57
(N-8M)	South side of Building (Bauer Equipment Area)	Noise	1.0	8.00 *
N-9M	Mill Crew Leader	Noise	1.0	< 1.0
N-10M	Fork Lift Operator	Noise	1.0	< 1.0
N-1S	Shop Area	Noise	1.0	< 1.0 *

DNO - Did Not Operate

() - Above TLV

* - Personal Protective Equipment Not Worn

() - Peak Exposure

CRMC-MAD-000866

Form ECD8-73 Rev.

DATE December 12, 1974
BIENNIAL INDUSTRIAL HYGIENE SURVEY
ALL STATIONSDIVISION Mining PLANT Los Angeles
(Talc) SURVEY DATE 11/11/74NOISE

<u>STATION NO.</u>	<u>STATION DESCRIPTION</u>	<u>HAZARD</u>	<u>TLV</u>	<u>CURRENT SURVEY RESULT</u>
V-1S	General Area Sample - Warehouse	Carbon Monoxide	50.0 ppm	10.0 ppm*
		Carbon Monoxide	50.0 ppm	10.0 ppm*
		Carbon Monoxide	50.0 ppm	11.0 ppm*
V-2S	Loading R. R. Box Car	Carbon Monoxide	50.0 ppm	130.0 ppm
		Carbon Monoxide	50.0 ppm	120.0 ppm
		Carbon Monoxide	50.0 ppm	10.0 ppm

DNO - Did Not Operate

() - Above TLV

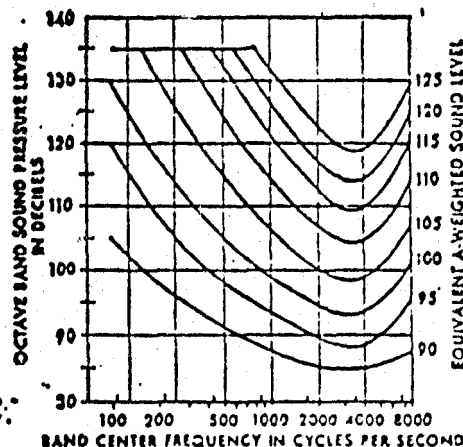
* - Personal Protective Equipment Not Worn

() - Peak Exposure

CRMC-MAD-000867

noise exposure shall be provided when the sound levels exceed those shown in Table G-16 when measured on the A scale of a standard sound level meter at slow response. When noise levels are determined by octave band analysis, the equivalent A-weighted sound level may be determined as follows:

Figure G-9



Equivalent sound level contours. Octave band sound pressure levels may be converted to the equivalent A-weighted sound level by plotting them on this graph and noting the A-weighted sound level corresponding to the point of highest penetration into the sound level contours. This equivalent A-weighted sound level, which may differ from the actual A-weighted sound level of the noise, is used to determine exposure limits from Table I.O-16.

(b) (1) When employees are subjected to sound exceeding those listed in Table G-16, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels within the levels of Table G-16, personal protective equipment shall be provided and used to reduce sound levels within the levels of the table.

(2) If the variations in noise level involve maxima at intervals of 1 second or less, it is to be considered continuous.

(3) In all cases where the sound levels exceed the values shown herein, a continuing, effective hearing conservation program shall be administered.

TABLE G-16—PERMISSIBLE NOISE EXPOSURES^a

Duration per day, hours	Sound level dBA slow response
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
½	110
¼ or less	115

^aWhen the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions: $C_1/T_1 + C_2/T_2 + C_n/T_n$ exceeds unity, then, the mixed exposure should be considered to exceed the limit value. C_n indicates the total time of exposure at a specified noise level, and T_n indicates the total time of exposure permitted at that level.

Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

TO: The Board of Directors

Report of Activity

On

HEALTH ASPECTS OF ASBESTOS

June 1, 1966 to January 1, 1968

January 15, 1968

CRMC-MAD-000869

17302

Report of Activity
On
HEALTH ASPECTS OF ASBESTOS

I. GENERAL BACKGROUND

Attached for reference is the only prior report to the Board on this subject, dated June 10, 1966. (Appendix A) It traces the origin of the asbestos-health problem and activities undertaken by Johns-Manville between March and June 1966.

This status report summarizes what has transpired since June 1966 and discusses current projects.

II. DEPARTMENT OF ENVIRONMENTAL CONTROL

In March 1967 Johns-Manville established a new Department of Environmental Control. Its director, Ed Fenner, a mechanical engineer by training, reports to A. C. Smith, Senior Vice President for Research, Development and Engineering. He directs a coordinated approach to the overall J-M environmental control situation dealing with both employee and general public, covering all divisions, plants and mines.

Every 60 days, this group gives C. B. Burnett and the President's Staff a detailed briefing on environmental control activities, backed up by a carefully documented written report.

As indicated by the attached extract from the November 1, 1967 Report (Appendix B), priority attention is being given to locations where asbestos dust levels are higher than we consider acceptable.

Because Johns-Manville was one of the first industrial firms to take a "total environment" approach and set up a special department, we have had favorable publicity in several trade publications, including OCCUPATIONAL HAZARDS. A reprint of the latter article is attached (Appendix C).

One project to which the Environmental Control Department is giving high priority is the development of "Codes of Practice" for the guidance of contractors and customers who handle and work with asbestos-containing products in the field. Several of these booklets are presently being prepared by the EC working with the Public Relations Department.

III. MEDICAL ADVISOR

In November, C. B. Burnett announced the appointment of Dr. George W. Wright as Consultant to the President on medical matters. Dr. Wright, Head of the Department of Medical Research at Saint Luke's Hospital, Cleveland, Ohio, is a recognized authority on asbestos and human health. A copy of his "Curriculum Vitae" is attached (Appendix D).

IV. ENVIRONMENTAL HEALTH COMMITTEE

To make certain that J-M takes a coordinated, high priority approach to the asbestos/health problem, C.B. Burnett early in 1967, designated an "Environmental Health Committee," under the chairmanship of F. J. Solon, Jr., Vice President, Advertising and Public Relations. This Committee, which meets bi-monthly to review progress, problems and plans, is composed of the following personnel:

C. B. Burnett, President

H. M. Ball, Senior Vice President, General Counsel

E. M. Fenner, Director, Environmental Control

H. M. Jackson, Manager, Industrial Relations
and Development

K. V. Lindell, Senior Vice President
Asbestos Fiber Division

A. B. Marchant, Senior Vice President
Industrial Relations

W. P. Raines
Director of Public Relations

Ivan Sabourin, Legal Counsel to the Quebec Asbestos
Mining Association

C. L. Sheckler, Manager, Occupational Environmental
Control

A. C. Smith, Senior Vice President
Research, Development & Engineering

F. J. Solon, Jr., Vice President, Advertising and
Public Relations

Dr. George W. Wright, Medical Consultant to the President

V. PUBLIC RELATIONS ACTIVITIES

Following are highlights of the public relations activities, in connection with the asbestos/health problem, that have been undertaken by the J-M Public Relations Department with the assistance of Hill & Knowlton, our Public Relations Counsel, during the past 18 months:

A. PUBLIC RELATIONS MATERIALS

Attached is a precisely worded statement titled "Asbestos and Human Health" (Appendix E) which summarizes presently known scientific facts concerning the relationship between asbestos and human health. It was developed by the Public Relations, Industrial Relations, Research and Environmental Control Departments and was reviewed and cleared by all members of the aforementioned Environmental Health Committee.

Quotes from this statement will be used, as needed, by the President, Chairman of Canadian Johns-Manville, Vice President for Finance, Vice President and General Counsel, Controller, the Environmental Control Department and the Public Relations Department in handling inquiries from stockholders, financial analysts, public officials, the press and other outside groups.

In addition, copies of "Asbestos and Human Health" have been distributed to Senior Officers, Division General Managers, Division Staff Managers, District Sales Managers, Plant and Mine Managers and Industrial Relations Managers at all J-M locations.

B. BACKGROUND PAPERS

We contemplate that this basic statement will answer most questions on the asbestos/health problem. However, for those dealing with scientific writers, the general press, financial analysts, etc., we decided it advisable to have greater detail available on a number of specific aspects of the asbestos/health question. Therefore, preparation is underway on seven "background papers" that will be, in effect, appendices to the basic position paper. Subjects include asbestos-cement pipe, asbestosis, mesothelioma, lung cancer, asbestos bodies, types of asbestos, asbestos and the general public.

C. ACTION PROGRAM

The development and use of the basic statement and the background papers, are part of an overall public relations action program that has been developed and approved by the Environmental Health Committee. A copy of this action program is attached (Appendix F).

D. HANDLING PRESS RELATIONS IN THE MANVILLE, NEW JERSEY AREA

In August, 1967, THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION published an article by four doctors at Somerset Hospital, Somerville, New Jersey, who said they had diagnosed 17 cases of mesothelioma, a very rare form of cancer, among patients living in the vicinity of the Johns-Manville Plant at Manville, New Jersey. They associated this frequency of mesothelioma with asbestos.

On Sunday, September 10, 1967 the NEWARK-STAR LEDGER ran a Page One article (Appendix G), reporting on this finding. Subsequently, every newspaper covering the general area of New Jersey where the Manville Plant is located ran articles on the subject. Although the basic statement had not been finalized at that time, the public relations Department worked with Legal, Industrial Relations and Environmental Control in developing interim statements that were used to help answer the accusations. In every case, the company was successful in working with editors in the development of follow-up articles that, while they did not absolve asbestos, did present the matter in an objective and realistic light and removed it from the "epidemic scare" atmosphere that had been generated by the initial reports. Attached

is a typical follow-up article, from the SOMERSET MESSENGER GAZETTE (Appendix H).

E. ASBESTOS-CEMENT PIPE ALLEGATIONS

Late in November, 1967 allegations about the possible hazard of drinking water supplied through asbestos-cement pipe were introduced into a politically-oriented fight in the metropolitan government of Nashville, Tennessee. Briefly -- for many years only cast iron pipe, supplied by one vendor, has been used in the Nashville water system. The Purchasing Committee of the City Council introduced the idea of asbestos-cement pipe as a possible alternate to cast iron.

Through means, not entirely clear at present, Dr. James Snell, a medical professor at Vanderbilt University, was inspired to write the head of the Nashville Metropolitan Water Department, expressing concern about the safety of asbestos-cement pipe, in view of the publicity that asbestos had received as an alleged cancer-causing agent. Dr. Snell's letter is attached (Appendix I).

Publication of Dr. Snell's letter in the NASHVILLE BANNER (Appendix J) and announced plans by the Purchasing Committee of the City Council to visit J-M's Manville Plant

more

generated considerable publicity and attention in Nashville.

Working with the Pipe Division, arrangements were made to host the city councilmen and Dr. George W. Wright talked with the group at length on asbestos/health. He put the problem into perspective by emphasizing that asbestos appears to be, at most, an occupational hazard that is definitely dose-related. He stated that there is no evidence to support Dr. Snell's allegation that the use of asbestos-cement water pipe might cause cancer. Dr. Wright's comments were given prominence by the NASHVILLE TENNESSEAN, the city's largest circulation newspaper, in its December 12, 1967 issue, clipping attached (Appendix K).

Following their return, the Nashville councilmen made further favorable comment about asbestos-cement pipe to the newspapers. (Appendix L).

Shortly after his talk with the Nashville group, Dr. Wright put his verbal comments into written form in a letter addressed to F. J. Solon, Jr. (Appendix M).

A further outgrowth of the Nashville situation has been the stated intent (based upon letters from Nashville officials) by the U. S. Department of Health, Education

and Welfare, to investigate the alleged health hazards of asbestos-cement pipe.

Photocopies of the damaging November 30th NASHVILLE BANNER article questioning asbestos-cement pipe began turning up in various other parts of the country, in the hands of officials charged with specification or purchase of water pipe. We had sufficient evidence to indicate these clippings were being placed by people connected with the cast iron pipe industry.

So, with legal counsel present and all proceedings tape recorded, a meeting was held at J-M's invitation on January 3, 1968, among the four principal manufacturers of asbestos-cement pipe with the Director of the American Water Works Association also present. These future courses of action were determined:

1. The need to visit informally with personnel of the Department of Health, Education and Welfare, to determine the future course of the proposed investigation of asbestos-cement pipe and the feasibility of broadening such an investigation to include all types of pipe carrying potable water.
2. The Director of Public Relations and Hill and Knowlton to proceed with a background paper on asbestos-cement pipe.

3. The General Counsel of Johns-Manville, as authorized by the other asbestos-cement manufacturers, to discuss with the Counsel for the Cast Iron Pipe Research Institute the poor advisability of using health hazard allegations as a device to promote the sale of any type of water pipe.

F. GOVERNMENTAL INTEREST

In addition to the above-stated involvement of the Department of Health, Education and Welfare with asbestos-cement pipe, several other indications of interest in asbestos and health, at the government level, are worthy of note. President Johnson's comments to a group of labor editors and Surgeon General Stewart's remarks at a Senate hearing are contained in our June 10, 1966 report to the Board. In addition, New Jersey Congressman Patten of Perth Amboy, in September 1967, introduced a bill designed to set standards in asbestos manufacturing and transportation. Attached is a copy of the newsletter (Appendix N) to his constituents, in which Representative Patten explains his proposed legislation. This Patten Bill received very little national publicity and the best information now that it is most unlikely that any action will be taken upon this proposed legislation.

To date, none of these actions has led to serious governmental interference with the asbestos industry but such interference as well as congressional investigation, remain quite distinct possibilities.

G. INDUSTRIAL HYGIENE FOUNDATION ADDRESS

In October 1967, F. J. Solon, Jr., Vice President, Advertising and Public Relations, delivered a paper on the subject "Communicating the Effectiveness of Industry's Hazard and Pollution Controls - Whose Job?" to the annual meeting of the Industrial Hygiene Foundation in Pittsburgh. He stressed both the importance of positive communication by industry of the facts regarding its occupational and environmental control problems, and the responsibility of medical and scientific people to challenge those of their colleagues who make sensational charges merely for the sake of publicity, without backup proof. The paper is being printed and distributed by IHF.

H. Monitoring, Evaluating and Circulating Medical Articles, Newspaper and Magazine Clippings, etc.

An important public relations activity is the continuous monitoring of medical journals, both domestic and foreign, as well as newspapers, magazines and radio and television programs, for scientific papers and articles relating to asbestos and health.



**AMERICAN
MINING
CONGRESS**

FOUNDED 1897

SUITE 300
1920 N STREET NW
WASHINGTON
DC 20036
202/861-2800
TWX 710-822-0126
J. ALLEN OVERTON JR.
PRESIDENT

MEMORANDUM

February 19, 1982

F.1e
Ame

TO: AMC Occupational Health Committee
Task Group on Asbestos
Task Group on Silica
AMC Occupational Health Consultants

FROM: H. Bradley Johnson, Vice President

NIOSH Study of Asbestos and Silica Dust Control

JRB Associates, McLean, Virginia, is conducting a NIOSH-sponsored technology assessment of asbestos and silica dust control in the mining industry. This study will parallel NIOSH activity to develop revised mine exposure standards for asbestos and silica.

The new Task Groups on Asbestos and Silica of the AMC Occupational Health Committee should be prepared to follow this activity and to comment on the results of the study.

The purposes of the contract are to:

- Estimate the extent and degree of worker exposure to asbestos and silica and develop a profile of exposure in terms of each mining and milling process, or other appropriate classifications;
- Evaluate the state-of-the-art technology for controlling exposure to asbestos or silica at mines and mills; and
- Evaluate the technological feasibility of applying alternate permissible exposure limits for asbestos (1f/cc, 0.5f/cc, 0.1f/cc) and silica (0.075mg/cu m, 0.050mg/cu m).

The scope of work includes mine and mill site visits to obtain information on exposure control and control methods. It is understood that no sampling or other measurements will be conducted by the contractor.

Enclosed is a copy of the statement of work from the contract, a table of categories of specific mining and milling operations developed by JRB, and JRB's list of potential sites.

On January 19, AMC staff met with Robert J. Katt and Patrick Bannister of JRB Associates and James Warren and Roy Fleming of NIOSH for a review of the project. The control technology study was apparently designed to parallel NIOSH's in-house health evaluations of asbestos and silica. The health studies have apparently been delayed. It also appears that the scope of the contract study is extremely broad and it may have to be modified.

Also enclosed are rosters of the Asbestos and Silica Task Groups.

Enclosures

CRMC-MAD-000881

78 1115 CE-100

2/18/82

TASK GROUP: Asbestos

C. S. Thompson
Manager, Research & Development
R. T. Vanderbilt Co., Inc.
30 Winfield Street
Norwalk, CT 06855
203/353-1400

D. "Sonny" Mukherjee
Industrial Hygienist-Mining & Minerals
Medical Division
CONOCO, Inc.
P. O. Box 1267
Ponca City, OK 74603
405/767-5489

A. J. Carlson
Environmental Technical Supervisor
Pickands Mather & Co.
1100 Superior Avenue
Cleveland, Ohio 44114
216/694-5934

William J. Hollar, Jr.
Environmental Health Engineer
Bethlehem Steel Corporation
B 238 Martin Tower
Bethlehem, PA 18016
215/694-7518

Warfield Garson, M.D., P.M.H.
Medical Director, Legislative and
Regulatory Health Affairs
Consolidation Coal Company
Consol Plaza
1800 Washington Road
Pittsburgh, PA 15241
412/831-4483

G. W. Stallard, Jr., M.D.
Director, Health Services
The Standard Oil Company
Midland Building
Cleveland, Ohio 44115
216/575-5926

Harry E. Rhodes
Occupational Health Manager
Union Carbide Corporation
134 - 47th Street
Niagara Falls, NY 14302
716/238-3375

Kenneth A. Roberts
Manager, Environmental Services
Manville Service Corporation
Ken-Caryl Ranch
Denver, CO 80217
303/978-3120

Robert L. Bockstahler
Eagle-Picher Industries, Inc.
580 Walnut Street
Cincinnati, OH 45202
513/721-7010

CRMC-MAD-000882

2/18/82

TASK GROUP: Silica

Warfield Garson, M.D., M.P.H. (Chairman)
Medical Director, Legislative and
Regulatory Health Affairs
Consolidation Coal Company
Consol Plaza
1800 Washington Road
Pittsburgh, PA 15241
412/831-4483

Doane Lucio
Chief Industrial Hygienist
Henderson Mine
Climax Molybdenum Company
P. O. Box 68
Empire, CO 80438
303/569-3221, Ext. 284

Robert W. Pickarz
Vice President-Engineering
and Environmental Affairs
Minerals Division
Eagle-Picher Industries, Inc.
P. O. Box 12130
Reno, NV 89510
702/322-3331

Donald L. Webster
Senior Environmental Health Engineer
Bethlehem Steel Corporation
B 238 Martin Tower
Bethlehem, PA 18016
215/694-4387

Larry W. Youngblood
Corporate Industrial Hygienist
Union Carbide Corporation
Old Ridgebury Road - Section Q-2
Danbury, CT 06817
203/794-5273

Joseph Schwerha, M.D.
Assistant Medical Director
U.S. Steel Corporation
600 Grant Street
Pittsburgh, PA 15230
412/433-2447

CRMC-MAD-000883

To Ken Roberts, HS&E

Date: 20 May 1982

From Nancy Olson, Public Affairs Office, Washington

Copies John H. Lonquist, Jr.

Subject NIOSH Study of Asbestos and Silica Dust Control

At your request I attended a meeting here in Washington of the American Mining Congress' Occupational Health Committee (Task Group on Asbestos and Silica) on Wednesday, May 19, 1982. It was attended by two officials from NIOSH, a representative from JRB Associates, three people from the American Mining Congress, representatives from Eagle Pitcher, SOHIO Industries, RT Vanderbilt, and me. The meeting began at 9 a.m. and ended around 11:15 a.m.

The purpose of the meeting was to review the status of a NIOSH-sponsored technology assessment study of asbestos and silica dust control in the mining industry. The contractor, JRB Associates, has completed Task I (development of exposure profiles) and is proceeding with Task II (evaluation of control technologies.) They expect to complete Task II by the end of May 1982. Task III will combine the results of I and II so that the feasibility of reducing dust levels throughout the mining industry can be determined. Completion of Task III is estimated for late summer.

Robert Katt of JRB Associates took over an hour reviewing their progress as outlined in the attached 80-page report. At the conclusion Katt emphasized that, if industry has any data beyond what is in this report, they would be happy to include it. Following your review, I would encourage you to share your comments with either Toni McCrary (202) 861-7509 or Henry Chajet (202) 861-2851 (both of the American Mining Congress), and then with NIOSH.

It was a most interesting meeting, and I was glad I was able to attend it on your behalf.

NJO/rt
Attachment

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
WASHINGTON, D.C. 20210



Office of the Assistant Secretary

JAN 10 1975

Mr. H. B. Vanderbilt, President
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 08855

Dear Mr. Vanderbilt:

This is to advise you that the Occupational Safety and Health Administration (OSHA) is rescinding the October 9, 1974 letter addressed to you from John H. Stender. A copy of this letter has been enclosed for your information.

The decision to rescind this letter was based on information recently supplied to OSHA by the National Institute for Occupational Safety and Health (NIOSH). In a current medical evaluation by NIOSH of Vanderbilt employees significantly exposed to airborne dusts including fibers, lung changes were demonstrated by x-rays in the exposed workers. In addition, NIOSH's review of medical records of former employees revealed that the number of deaths attributed to both respiratory disease and lung cancer appeared to be significantly above those expected. Although the data are preliminary, they indicate the hazardous nature of tremolytic talc. In light of the information supplied by NIOSH, OSHA must rescind the above mentioned letter of October 9, 1974.

In a recent memo to our Regional Administrators and Area Directors, OSHA cancelled Field Information Memorandum #74-92. Our compliance officers have been advised to follow the sampling method for asbestos when evaluating employee exposure to fibrous tremolytic talc. They have been so advised because a tremolite fiber is an asbestos fiber under OSHA's asbestos standard 29 CFR 1910.1001. A copy of this memo has also been enclosed.

If you have any questions regarding our compliance policy where tremolytic talc is concerned, please do not hesitate to contact me.

Morton Corn

Morton Corn
Assistant Secretary of Labor

Enclosures

MARGINALIA
REDACTED

CRMC-MAD-000885

July 8, 1969

COPY FOR - R V LINDELL.

S. R. Prigmore

Report on visit to Gouverneur Telco Co. Mine

Purpose

To determine feasibility of using a pressure packer for packaging talc.

General

Mine is located about 8 miles south of town of Gouverneur N. Y..
Underground Mine and Mill located in close proximity.

Total work force stated as 140 with 50 men underground. Work on day shift only with some overtime. Use wage incentives underground as in mill bagging section. Unionized by United Steel Workers. Base rate \$2.17 for janitor and \$3.13 for electrician. Ore is described as tremolite and the samples shown us varied from massive samples to fibrous type of sample similar to our slip fibre although the fibres are not clearly delineated. Silica content stated as being 60%. Product is used for paint and ceramic tile manufacture.

We were received by G. E. Erdman, mine manager and we visited parts of the Mill only in company with the manager and the Mill Superintendent. We were not invited to look at the U/G, the head frame, the quality control lab nor were we shown any flow sheets, plans, etc. Although all questions were answered very little was volunteered.

Underground Mine

Described as having levels at the 300, 500 and 700' elevations, and producing 600 tons of ore daily. Mining is by open stoping leaving pillars as required. Benches are drilled as blasted with jacklegs and the stope left empty. Backs are supported with roof bolts. Waste material now being used for back filling upper level stopes. Rail tramming to 36" x 42" underground jaw crusher and then skipped to surface. General conditions stated as good requiring little support.

CRMC-MAD-000886

The original mineral rights to the property were held by an individual who apparently sold the talc rights to St. Joe Lead Co. but held on to the talc rights and then eventually disposed of these to the predecessor of the Vanderbilt Co. As a result the two companies apparently mine on the same property and since St. Joe were there first the location of the talc mine shaft and facilities are dictated by St. Joe Lead. Braden stated that in places underground there were workings within 25' of each other. Gouverneur are deepening their shaft and the 1100' level intersect their own ore body, indicating the shaft must be in the hanging wall.

MILL:

Process is purely mechanical. Ore from underground was crushed again in a 36" gyratory crusher followed by cone crushing, ball mills (using ceramic balls and specially imported stone liners) and energy mills. Only screens used were scalping screens. Apparently ore is dried but were not shown this facility. Basically there are 5 grades of product Nylol 99, 100, 200, 300 and 400. The Nylol 400 is the most finely ground and is the premium grade apparently used for ceramic finishes.

65% of their production is bagged in 50 lb valve paper bags and the remaining 35% is bulk shipped by railway in customer rented hopper cars and occasionally in a box car specially supplied by the Penn. State RR.

Bagging operations consisted of 2 banks of 4 haver type impeller packers and a bank of 2 jet flow packers. Cycle time per 50 lb. bag is 8 seconds. Bags were dropped from packer onto a conveyor belt flattened out, and then hand palletized and were being loaded into a box car.

Mill apparently able to produce up to 600 tons/day of product. Product was quite dense and free-flowing.

Aspiration

Was stated (again we were not shown) as being handled by one large wheelabrator, sock type with a sly filter and 2 Parsons filters. Did not know the C.F.M. capacities. Most equipment appeared to be aspirated. The only conveyor belt we were shown had aspiration hoods at the feed and tail end but the belt was not enclosed. General condition and design of aspiration piping, etc. looked neglected.

Housekeeping was not good. All horizontal surfaces covered with 1 or 2" of white product.

When questioned as to T.L.V.'s for Talc, Brönan was uncertain but thought it might be 5. Stated that dust surveys were made but uncertain of instrument used. Claimed that the only pneumoconiosis cases or prospective cases were employees that had formerly worked at other mines.

The only respirator seen was produced by an employee palletizing a broken bag. Respirator wearing on a voluntary basis.

Manager felt that their dust handling system was far in advance of other local talc producing mines.

General impression during our visit was that dust conditions seen were not severe but that they certainly could be improved. Beams of sunlight in some areas showed dust. Mill was by no means as clean as ours nor as well aspirated. Buildings and facilities were second class.

Conclusion as to purpose of visit

Since material appeared to be very free flowing and fairly dense we could see no particular advantage to pressure packing. We felt that the bags would not hold their shape and packers would be somewhat slow. Since they were only palletizing one pallet high - deformation is not a problem. Going to 100 lb. bags seemed out of the question since their customers were all formulating on bag counts of 50 lb. bags.

R.B. Gresham

R. B. Gresham

RBG:jmg



Johns-Manville

Internal Correspondence

To: F. J. Solon - 4 North Date: August 31, 1973

From: R. S. Lamar - R&D Center

Copies: See below

Subject: DIFFERENCES AMONG DESERTALC G-1, G-2, VANDERBILT AND
INTERNATIONAL NEW YORK STATE TALCS PER YOUR REQUEST
OF AUGUST 30, 1973

Desert Minerals mines two distinct grades of crude talc ore in Warm Springs Canyon. These form the base for the bulk of our present talc business.

G-1 ore contains 30 to 35 per cent tremolite and no detectable chrysotile by the usual petrographic and/or X-ray diffraction methods. G-2 ore contains 5 to 10 per cent tremolite and again no detectable chrysotile by the usual methods of analysis.

The New York State talcs produced by both R. T. Vanderbilt and International Talc Company are considerably higher in tremolite--up to as much as 50 to 70 per cent and contain, in addition, significant amounts of chrysotile. For example, differential thermal analyses (DTA) tests on some samples show nothing but serpentine (chrysotile is the fibrous variety of serpentine). DTA does not distinguish between the fibrous and non-fibrous varieties, but transmission electron micrographs of these products confirm the presence of much chrysotile.

These are the major differences among these products.

R. S. LAMAR

rs

CC:

W. L. VanDerbeek - 2 West
P. A. Martinson - 2 West
J. M. Sharratt - 2 West
H. R. Keefe - 2 West
P. P. Carter - 5 West
G. E. Parker - 5 West

F. L. Pundsack - R&D Center
S. Speil - R&D Center
W. C. Streib - R&D Center

CRMC-MAD-000889

RFB

MEMORANDUM TO: R. F. Bassett
FROM: Earl B. Smith
SUBJECT: Monthly Report For September 1972
DATE: October 10, 1972

I. Final tonnage 4479

II. FDA-OSHA

- A. Delegation of Jackson, Carter, Scheffel called at Washington FDA headquarters to meet with Spier to discuss the postponement of October 12 deadline for comments re proposed FDA regulation.
- B. Talc Industry Association meeting held at R. T. Vanderbilt headquarters New York September 28 with Carter and Scheffel in attendance.
- C. FDA-OSHA conference held October 2 - 3 at DHQ reported in EBS memo to P. A. Martinson under date October 2, 1972. Attendance at meeting Martinson, Fenner, Jackson, Reitze, Scheffel, Carter, Donovan and Smith. Conclusions, plans and actions defined in meeting minutes.
- D. Business lost to date due FDA or OSHA as follows:
 - 1. Sinclair Paint Company, Los Angeles --- lost one 30-ton carload September mixed products DESERTALC® 54, DESERTALC HI-FINE 80, and DESERTALC MIKRO 707.
 - 2. Crown Simpson Pulp Company, Arcata, California --- two 22-ton truck loads September postponed due proposed FDA regulations. Consumption two truck loads per month will be postponed until disposition of proposed regulations is established.
 - 3. Crown Zellerbach, Wauna, Oregon --- one 50-ton carload CYCLO-SORB® scheduled October postponed due proposed FDA regulations.
 - 4. North Western Pulp and Paper Division, Hinton, Alberta, Canada -- a "would be" customer requiring one carload per 60-day period. Potential business postponed due FDA proposed regulation.
 - 5. National Gypsum, Long Beach, California --- would be customer requiring 50-ton carload per month "tremolite-free" per OSHA regulations. Cost DESERTALC HI-PURE series uneconomical vs. competition.

LA112

01 02 15

CRMC-MAD-000890

RFB
89-1

Desert Minerals, Inc. - Long Beach
October 10, 1972

W. L. VanDerbeek
P. A. Martinson*
E. M. Fenner*
H. M. Jackson*
W. B. Reitze*
N. B. Scheffel*
R. P. Carter*
S. Speil
H. G. Donovan*
E. B. Smith*

FDA - OSHA MEETING RE TALC OCTOBER 2, 1972

This is a report of meeting (* in attendance) convened on October 2, 1972, in Celite Division conference room to define plans of action in matters relating to DESERTALCO® and CYCLONIZED® products under the proposed FDA regulations and the existing OSHA regulations. The meeting was called per PAM memo dated 9/22/72. Objectives and agenda were defined per EBS memo dated 9/26/72 (copy attached).

Minutes of meeting and plans of action as follows---

I. FDA PROPOSED AMENDMENT OF PART 121 (FOOD ADDITIVES) CONCERNING FOOD OR FOOD PACKAGING MATERIAL CONTAINING TALC

A. STATUS TO DATE

1. RPC reported on meeting at Washington offices of FDA on September 20 with Allan T. Spiher, Jr., (HMJ, RPC, and NBS attending). Assumption that talc is carcinogenic originates entirely from recent publication in Science Magazine, Vol. 173, pages 1141-1142, dated September 17, 1971. No further FDA studies were made. Assumption in proposed regulation is that talc is 100% free of asbestos-form particles. No studies nor knowledge concerning processing to remove asbestos-form particles. It was further implied during discussions that even asbestos-free talc may be considered carcinogenic and that further studies are planned in this direction. Spiher reported that two comments had been received to the publication in the Federal Register. A Japanese housewife wrote in stating that she was pleased to see some Government action to protect the populace. Also, a medical doctor in Columbus (R. J. Manner, M.D.) wrote that he was aware of no studies concerning ingestion and carcinogens and that he would appreciate receiving the written reports on which this FDA proposal is based. Also submitted for consideration at the meeting was a publishment in the Food Chemical News, dated September 25, 1972, which reported on a USD proposal requesting a limit of 1% asked for asbestos in talc. This should be considered in our further actions.

CRMC-MAD-000891

LA112

Conclusion of the delegation was that industry is considered guilty until proven innocent. Spiher indicated that a postponement against the 60-day deadline (October 12, 1972) could be obtained provided good and sufficient reasons were presented indicating a factual program of study to refute the claims for the proposed regulation.

2. Report from NBS and RPC on the R. T. Vanderbilt Talc Industry Meeting at the RTV offices in New York on September 28. Apparently neither RTV nor the fractured Talc Industry Association has a positive program in either the FDA or the OSHA matter. RTV continues to study the medical aspect but no positive results are indicated. RTV claims to have developed an endorsement through EPA at Durham, North Carolina, which will classify "industrial asbestos" and not include tremolite per se. EMF reacted that this may not be an effective approach since EPA and other agencies are not necessarily in communication because of differing objectives.

3. Arguments:

- a. General discussion on the definitions of "asbestos-form." PAM suggests approaching the word talc to develop a differentiation from the proposed definition. It was concluded that further consideration of the nature of the particles as asbestos-form or fibers or alternatively another definition should be considered.
- b. Health hazard:
The reference article by Blaegher and Arlon concerning industrial carcinogens and concerning migration of particles into the bloodstream is being secured by RPC and will be further evaluated in consideration of ingestion versus respiration. Dr. George W. Wright, Medical Research Division at St. Lukes Hospital in Cleveland, submitted a letter to HMJ, dated September 18, expressing opinions of doubt as to the medical proof provided in this connection by the subject publication. This will be further investigated.
- c. Processing for removal:
Opinion expressed from this talc producers knowledge that processing to remove tremolite from talc is impractical as a 100% beneficiation and should be further explored in the context of the proposed regulation.
- d. Migration of particles from packaging materials:
The FDA meeting in further considerations indicate that the best approach to the proposed article is to develop proof that the particles do not migrate from food packaging material and a programmed study will verify this fact. Any tremolite particles present in our talcs would be in sufficiently small percentage in packaging materials and will further be locked in or bonded to the extent that they will be nonmigratory. NBS presented a proposal of study for paper test program to

prove the matter. Additional studies will be programmed for coatings and plastics to present similar evidence for other food packaging materials.

B. ACTION

1. RPC presented a proposed letter to be directed to the Hearing Clerk, at the Department of HEW, proposing a postponement of the October 12 deadline during which prescribed and defined studies will be conducted presenting evidence in refutation of the proposed regulation. The article was edited in detail by all committee members and finalized for submission by certified mail, return receipt requested. A copy of this letter will be forwarded to the J-M Washington office (W. Winblat) for personal follow up from that office to ascertain acceptance and action taken.
2. Follow-up documents and procedures:
Assignments were made according to the five proposed studies listed in the FDA proposal as follows:
 - a. Re definition of "asbestos-form particle" versus fiber, etc. Drs. Speil and Wright will collaborate in the development of an appropriate definition. HMJ to advise Dr. Speil and Dr. Wright. Consideration will be given to medical evidence reported and related publications, and to mineralogical considerations concerning particular matter as talc, tremolite, in relation to fibers or nonfibers.
 - b. Tests concerning measurement of the content, size, and identification of particles contained in talc. Dr. Speil and Dick Lamar will collaborate in this study. EBS to advise RSL and HMJ to advise Dr. Speil.
 - c. Migration studies:
Norman Scheffel has scheduled a 2 - 3 day study at Western Michigan University starting October 23, 1972. CYCLO-FIL®, CYCLO-SORB®, and asbestos will be evaluated by code number. HGD to forward quantity of asbestos for these tests. Dr. Kukulich, Professor of Paper Technology, will coordinate and work with NBS in this study and submit final report. NBS to secure additional samples of paper utilized for packaging from Brown Paper at Kalamazoo and others for further verification on commercial stock. It is anticipated that the results of this study will be available from NBS in report form by Also, NBS will contact W. C. Streib in reference to a similar study for plastics and coatings concerning availability of J-M Research and Development facilities. A meeting was arranged with Streib, Lamar, Scheffel, and Smith on October 12 to discuss this and further action in relation to FDA and OSHA regulations.

CRMC-MAD-000893

LA112

- d. Re processing to remove asbestos-form particles. EBS and RSL to explore processing methods and present conclusions and opinions and feasibility and economics of the beneficiation of talc to remove tremolite and the practical degree to which removal can be expected. Dr. Speil to also be consulted in this connection.
 - e. Medical evidence to refute carcinogenic aspects. Dr. George Wright will conduct this study as an independent project. HMJ will notify. Included will be consideration of the Blaegher and Arlon article, Kleinfelt studies on the talcosis in talc workers, consideration of LD 50 or other animal studies at the Hazelton Laboratory, information that may be available through and with the National Institute of Health, and any other areas of consideration.
3. Further action and thoughts for action:
- a. A meeting is suggested to include Dr. Wright, Dr. Speil, R. S. Lamar, EBS and HMJ to explore various medical, physical, mineralogical, and practical aspects of this FDA proposed regulation. HMJ will schedule this meeting as soon as Dr. Wright returns from Europe and that it can be coordinated with all other interested parties.
 - b. HMJ suggests that we can reserve the studies concerning lethal dosage (LD) evaluations or the usage of the Hazelton Laboratory at Falls Church, Virginia, for an extension beyond the six-months period, if necessary. In other words, these studies may require more time than initially proposed in this request for postponement, and such studies could be beneficial subject further consideration by Dr. Wright and Dr. Speil.
 - c. It is further suggested that Mr. Frank Gunderson, a former technical director of Quaker Oats Company, and currently a consultant to Brown Paper Company, may be considered at a later date for assistance with the FDA presentations or hearings that may develop from these studies proposed at this time.
 - d. NBS, EBS, RSL and WCS to consider internal or external means by which studies can be conducted concerning plastics and coatings migratory tests. NBS suggested the Polymer Laboratory of the University of Akron will be a candidate to conduct these studies. Battelle, McCrone & Associates, D. H. Litter Laboratories, and others may be considered. These matters to be discussed at the proposed conference for Research and Development October 12 in Denver.

II. OSHA REGULATIONS PART 1910 CONCERNING TREMOLITE AS RELATED TO ASBESTOS FIBERS

A. RECLASSIFICATION OF TREMOLITE:

EMF expressed firm opinion that we haven't got a prayer concerning establishing a variance or amendment to the OSHA regulation with respect to tremolite. It is true that we are "damned by association" because there have been no studies to present medical evidence concerning actinolite or tremolite in the matter of mesothelioma. The cases developed concerning talc workers (Vermont and New York State) concerned talcosis. This evidence was comparable to silicosis documentation and the studies covered a similarly long-term period of three years or more. However, since mesothelioma was not known or defined in those prior years, no evidence was developed relating to this condition. Furthermore, EMF and HMJ report that amosite and crocidolite have proven causative to mesothelioma. Both these materials have a "fibrous" nature that is similar to tremolite. The electron micrographs exhibited in a symposium of papers presented to the Canadian Institute of Mining and Metallurgy and reprinted by the Quebec Asbestos Mining Association "1958" exhibit this characteristic on pages 21-23 comparing amosite, crocidolite, and tremolite. Thus, HMJ expressed the opinion that an attack on "fibers" delineated from tremolite would be a long-term study. Tremolite was not separately identified in the OSHA hearing, so evidence would have to be developed to disclaim tremolite functioning as an asbestos mineral. There appears to be no area of attack by reclassification of tremolite through mineralogical or structural definition. Any approach to disassociation will require medical evidence.

B. MEDICAL EVIDENCE:

Since there may be a key medically, it is proposed that the services of Dr. Wright and Dr. Speil be enlisted for suggestions on a literature search and medical studies that could be developed. HMJ will determine when Dr. Wright will be available and EMF will determine when Dr. Speil will be available. A meeting is to be called at the earliest opportunity to explore this approach. EBS will also explore any information that may be available from California mining and/or insurance records related to exposure in California talc mining operations.

C. TALC INDUSTRY ASSOCIATION:

To date, the Talc Industry Association has been ineffective. USD and Pfizer have declined to participate. RTV has been the only active member in calling the meetings and in conducting exploratory studies in this area. International Talc has attended the meetings, but apparently have made no contribution. The other talc producers attending have similarly been inactive. The only area of interest that RTV has developed concerns EPA at Durham, North Carolina, regarding a proposal to exclude talc from the regulations and consider only "commercial asbestos" for environmental control. EMF considers this information will be no help to OSHA because of dissimilarity of interest and incompatibility of the organizations. It is concluded that we

should attend future meetings and be guided accordingly. In view of the fact that New York State talcs are considerably more tremolitic than California talcs; it should be considered a caution in all meetings that we should avoid a direct classification with New York State talcs. Our percentage of tremolite in all of our products is lowered, which we consider "residual", and any usage conditions should be considered in this context.

III. MARKETING PROGRAM WITHIN EXISTING OSHA REGULATION

A. COMPETITION:

New York State talcs (RTV and International) are tremolitic. California talcs (USD, Pfizer, RTV) are semi-tremolitic including some grades at very low to nil tremolite content. Montana talcs (USD and Pfizer) are tremolite free. Accordingly, our competitors are directing their marketing program in this pattern. RTV has submitted to the trade a statement attesting that their talcs conform to regulations under usage conditions. USD and Pfizer are advising their customers similarly and, in fact, with considerably greater strength because of their Montana talc characteristics.

B. FIBER COUNT IN USAGE "AIR-BORNE CONCENTRATION":

1. EBS memo September 20 re Use Tests at Lompoc:

EMF discussed memo in reference response from Dr. Speil. Answers to questions posed from page two by items as follows:

Item 1

The fibers in the fiber count reported were not evaluated as to whether they are truly tremolite. They are truly fibers according to the fiber definition of 3/1 size ratio. It is not known if they are truly fibers of tremolite. Nontremolitic particles of a fibrous shape are not counted. In other words, these comments indicate some uncertainty as to whether the fibers counted are truly tremolite. In view of further uncertainties of the test, it is suggested that these tests be rerun and further monitoring of the nature of the fibers be conducted.

Item 2

The order of testing was G-1, G-2 products, and White Eagle products. Apparently there was cross contamination in the tests which distorted fiber counts from lower level tremolitic materials into an abnormally high-count range. Retesting will eliminate this hazard.

Item 4

Variation between Finderne and Lompoc counts explain by procedures and location of millipore filter mounting location. Again, retesting is indicated.

Item 5

Ambient air value should not be deducted since measurement of fiber count in usage is the criteria.

Item 6

Variances are significant enough and too short to be considered unreliable. Retesting is indicated.

Item 7

A maximum 10 fibers should be applied to this data as well as additional data on studies that are of short duration.

Item 8

Concerning developing an official statement, see Item III D, below.

2. Customer environmental testing:

Sinclair Paint test results reported per memorandum submitted to committee by EMF, dated September 26, 1972, written by Kenneth Williams and directed to G. L. Swallow. Report indicates neither USD Fibrene C-400 nor DESERTALC® 54 conform to the maximum fiber count of 10 fibers per cc; although USD products just slightly over limit and DESERTALC 54 2½ to 3 times over the limit. Customer will react that C-400 is close enough with proper ventilation, but what does DESERTALC 54 do? This reaction was later verified in personal call at Sinclair Paint by EBS on October 6, 1972. Further tests again indicated.

C. BAG LABELING:

HMJ states OSHA citation concerning inadequate or improper labeling can result in a fine of a minimum of \$600 and possibly up to \$1,000. Our position concerning studies in progress could be a mitigating factor to avoid a citation, but this is problematical. PAM suggests changing the wording to "asbestos-form." HMJ reaction that the only official and acceptable wording is that as described in the regulations, and that any deviation therefrom could be damaging if considered in terms of willful violation of the law. In this context, no statement during our investigation would be better than a misstatement. Therefore, since it is felt from the fiber counts determined to date that our talcs will conform to OSHA regulations when used under appropriate manufacturing conditions, that these studies should be continued and completed as soon as possible before the final decision is made concerning bag labeling. See statement below concerning proposed marketing statement.

D. OFFICIAL MARKETING STATEMENT:

The following statement was drafted jointly for consideration by all parties and legal counsel concerning usage:

1. "Under normal conditions of manufacturing with adequate dust control as required by OSHA regulations, our DESERTALCS and

CYCLONIZED products will comply with the OSHA maximum allowable fiber levels." EBS will put this statement into a letter form and submit to P. A. Martinson for channeling for official approval.

HMJ also commented on the regulation that the requirements of special clothing, two lockers for clothing exchange, etc., are not required if the products are used in conformance with OSHA regulations. However, HMJ stated that the periodic medical examinations are required for any exposure to asbestos. EBS to obtain an official statement concerning this application of the regulations.

E. CUSTOMER ENVIRONMENTAL USAGE ASSISTANCE:

To be further considered as marketing requirements dictate. Immediate action required on Sherwin-Williams proposal for testing. EMF will have Bramm in San Francisco contact Sherwin-Williams to schedule testing for both asbestos and DESERTALC environmental usage at the Oakland plant. EBS will secure costs from Jack Garber for further consideration of handling with the customer. EBS follow up and develop future policy for customer environmental assistance.

IV. CONCLUSIONS AND PLANS OF ACTION

A. FDA PROPOSED REGULATIONS:

Follow-up postponement of October 12 deadline and investigations of all items programmed to redefine proposed regulation per I, Item 1 above.

B. OSHA REGULATIONS:

1. Pursue potential medical studies in conference with Drs. Wright and Speil intended to establish variance or amendment to regulation per II above.
2. Develop official marketing statement (EBS), for customer re usage of our products under OSHA regulations.
3. Schedule new series of tests at Lompoc under the following conditions:
 - a. Use peak tests only.
 - b. Three tests each product at 12 bags each test.
 - c. Evaluate competitive product (C-400).
 - d. Test each material one day apart to eliminate cross contamination.
 - e. Change monitor each cycle.
 - f. Utilize ventilation conditions.
 - g. Test the following samples: DESERTALC 54, DESERTALC 24, DESERTALC HI-PURE 144, CYCLO-FIL, CYCLO-SORB, USD C-400.
 - h. EMF department to define test program to Lompoc; EBS ship materials to Lompoc and coordinate schedule of test program

CRMC-MAD-000898

LA112

4. Bag labeling

Labeling decision pending tests at Lompoc and customer usage study.

5. Customer environmental usage assistance

Develop marketing program after Sherwin-Williams Tests.

6. New products program

Meeting scheduled at 3 p. m. October 12 for Research and Development program to consider modification of products for entirely new approach to OSHA problem (attending WCS, RSL, NBS, HRK, and EBS). EBS develop agenda in consideration following general outline:

1. Pellets
2. Slurry
3. Binder for industry usage (paper, paint, plastics, rubber, etc.)
4. Beneficiation
5. Any other approach

Earl B. Smith - Sales Manager
EBS:tjf

CRMC-MAD-000899

LA112

41 0281

R. T. VANDERBILT COMPANY, INC.

33 WINFIELD STREET

EAST NORWALK, CONNECTICUT 06855

CABLE ADDRESS
BILTVA NEW YORK

AUG 21 1972

August 17, 1972

JEC	X	WSE	Y	HFB	X
EBG		NBS		SRM	
TER		JEC		DEN	
EP 21972					
OT		AJM		KJB	
NON		DHM		TJF	

Mr. William B. Reitze
Johns-Manville Corporation
5680 South Syracuse Circle
Denver, Colorado 80110

Dear Bill:

Enclosed are copies of two form letters which we will use for certain of our customers regarding the tremo-lite situation. You may find these of help.

Sincerely yours,

RCB
R. C. Bacon, Director
Research & Development Division

RCB:mjh

Enclosures

*End 1
This is the info from Vanderbilt
Bill*

CRMC-MAD-000900

REPLY TO CUSTOMER INQUIRY RE THE EFFECT OF
THE ILLINOIS POLLUTION CONTROL BOARD'S REGULATIONS FOR ASBESTOS DUST
ON THE USE OF VANDERBILT TALCS

In answer to your letter of _____, we have determined that about one-third of our NYTAL talc consists of the mineral tremolite. Although the overwhelming percentage of tremolite in our product is of the non-fibrous type, particles can be found whose length to breadth ratio is 3 to 1 or greater, thus putting them into the category of a fiber as defined by the Illinois Standard.

Since our NYTAL ores are not mined or used as asbestos, we take issue with the Illinois Pollution Control Board, both in the definition of an asbestos fiber and the inclusion of tremolite per se as asbestos. At present, it is our belief that the existence of tremolite in our product does not constitute a mineral dust exposure hazard greater than that of non-asbestiform talc. Furthermore, although an exact determination has not been made, we believe that the content of so-called "fibers" in our product is low enough to present little or no inconvenience to the user in complying with the Illinois Standard limit for ambient air of two fibers per cubic centimeter of air.

8/15/72

CRMC-MAD-000901

LA112

REPLY TO CUSTOMER INQUIRY RE TALC AND ASBESTOS
FOR OSHA ASBESTOS DUST REGULATIONS

In reply to your recent inquiry concerning the _____ content
of our _____, it has been determined that _____

NYTAL -- about one-third.

WESTAL -- a small proportion

consists of the mineral tremolite, most of which exists in the form of
nodules, rods and plates. To the best of our knowledge, there are no
asbestos fibers in our talcs according to the definition of a fiber as a
soft, threadlike object that has a length usually many hundred or thousand
times greater than its width and that possesses considerable tensile strength.

According to the Occupational Safety and Health Act standard
dealing with asbestos dust, tremolite has been lumped into the category of
asbestos. However, we are in the process of gathering evidence to refute
the governmental contention that tremolite per se is asbestos and therefore
governed by asbestos regulations. When we have accumulated sufficient data,
we plan to petition for an amendment to the standard, so that tremolite
may be classified with other mineral dusts.

We would like to call your attention to the fact that neither
the asbestos dust standard nor the original air contaminant standard of the
Occupational Safety and Health Act prohibits the use of tremolite-containing
dusts or any other dust-producing mineral. Both standards do, of course,
regulate air quality in the workplace, so that adequate dust control
measures must be taken no matter what dusts are involved.

We would be pleased to discuss this matter further with you,
should you so desire.

CRMC-MAD-000902

June 21, 1972

Mr. G. L. Fiederlein
R. T. Vanderbilt Company, Inc.
230 Park Avenue
New York, New York 10017

Dear Mr. Fiederlein:

Enclosed is Johns-Manville check, in the amount of \$300.00, for expenses in connection with the talc producers' group, as requested in Mr. R. C. Bacon's letter of June 6, 1972.

Sincerely,

P. A. Martinson
Vice President
General Manager

enclosure

BC:

H. M. Jackson
W. B. Reitze
E. M. Fenner

~~D~~
C

CRMC-MAD-000903

LA112

DATE June 20, 1972

REQUEST

LOCATION Celite DHQ - Denver

CHECK NO. _____

CASH ☐

PAY TO:

FOR

G. L. Fiederlein

CHECK ☒

Form 3-90 Ptd. in U. S. A.

\$300.00

AMOUNT

114 PAYMENT FOR (CIRCLE ANY PORTION OF EXPLANATION TO BE SHOWN ON CHECK VOUCHER)

Talc Industry Producers' Survey

Please send check to Kay Silverman - 2nd West --
for transmittal with covering letter

VOUCHER NUMBER	RESP.	ACCOUNT NUMBER	OTHER CODES	AMOUNTS	CORRECT	APPROVED
	C01004				CASHIER	

TOTAL \$300.00

RECEIVED
CASH
PAYMENT _____

CHECKS ARE ALWAYS SENT TO PAYEE.
IF THIS CHECK IS NOT TO BE SENT TO PAYEE,
GIVE NAME AND ADDRESS AND STATE REASON.

CRM-C-MAD-000904

1A112-010310

JUN 7 1972

R. T. VANDERBILT COMPANY, INC.

33 WINFIELD STREET
EAST NORWALK, CONNECTICUT 06855

CABLE ADDRESS
BILTVAN NEW YORK

June 6, 1972

Mr. Peter McCarthy, International Talc Company, New York, N. Y.
Mr. William Stephenson, Pfizer, Inc., New York, N. Y.
Mr. Alan Dankworth, Engelhard Minerals & Chemicals Corp., Edison, N. J.
Mr. Peter Bixby, American Talc Company, Summit, N. J.
Mr. Carl Klaus, American Olean Company, Lansdale, Pa.
Mr. Larry Driscoll, Whittaker, Clark & Daniells, So. Plainfield, N. J.
Mr. Norman Scheffel, Desert Minerals, Laguna Beach, California
Mr. William Reitze, Johns-Manville Corporation, New York, N. Y.
Mr. H. B. Vanderbilt, R. T. Vanderbilt Company, Inc., New York, N. Y.

Gentlemen:

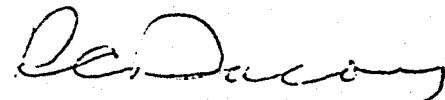
I have been asked by the talc group to write you and request that you prepare and have ready for shipment representative samples of at least five pounds each of your crude ore or ores (if you have different types) as well as of your major talc products.

As you will see from the copy of the minutes you will receive from Alan Dankworth of Engelhard, several company representatives indicated the possibility of cooperating in gathering extensive mineralogical data on the different talc ores for use in our dealings with the authorities in Washington and in the various states in connection with health and safety and environmental regulations. It is agreed that the data developed from these samples will be open to all the members of the talc group who contribute to it financially. It is further agreed that this data will not be available to anyone else without written permission from the particular company involved.

Portions of the samples if needed by others in the group for mineralogical testing not available at the above two laboratories would be sent to the particular company laboratory in question under the same conditions.

The above can be discussed further at our next meeting scheduled for June 15th at 10 A.M. in the Vanderbilt offices.

Sincerely yours,



R. C. Bacon, Director
Research & Development Division

RCB:mjh

CRMC-MAD-000905

GHQ, New York
June 2, 1972

H. M. Jackson, Dvr.
P. A. Martinsen, Dvr.

TALC PRODUCERS MEETING JUNE 1

On June 1, 1972, at 2:00 P.M. a meeting was held in the office of R. T. Vanderbilt Company, Inc., 200 Park Avenue, New York, N. Y. The following people were in attendance:

Mr. Peter McCarthy, Exec. V.P.
International Talc Company

Mr. Robert McCarthy
International Talc Company

Mr. Alan J. Bankworth
Product Manager, Industrial Products
Engelhard Minerals & Chemicals Corp.

Mr. Lawrence Driscoll, President
Whittaker, Clark & Daniels

X
Mr. Norman Schaffel, V. P.
Technical Service
Desert Minerals

Mr. R. C. Bacon, Director Research
R. T. Vanderbilt Company, Inc.

Mr. Paul B. Gibney, Attorney
Davis, Gilbert, Levine & Schwartz

The group was of the opinion that they would remain as a loosely formed organization until such time as it became necessary to incorporate. Several points were discussed.

1. There will probably be 6 to 8 members including International Talc Co., Pfizer, Inc., Engelhard Minerals & Chemicals Corp., Whittaker, Clark & Daniels, and Desert Minerals (J-M).

2. The cost of becoming a member would be \$300 per firm. It was felt that this amount of money from each firm would provide enough funds to make preliminary investigations. These preliminary investigations would then lead to a more positive course of action for the group.

3. A meeting is tentatively planned for June 15, 1972, at which time the group or committee will meet with three physicians to discuss talc and its associated health problems. The three physicians are G. W. Schepers, M.D., Dr. Kleinfelt of the New York State group, and Dr. Klingerman of the University of Pennsylvania.

It is hoped that these physicians will be able to advise the group of possible problems as well as suggest studies that could be undertaken to refute the existing medical evidence.

4. A plan was also advanced to have several of the member companies, namely, Vanderbilt and Engelhard undertake analytical studies on both crude and products.

I informed the group that our research lab will be in the process of moving and their help might be somewhat limited.

There are several things we must consider. First of all, this group is still rather intent on proving to OSHA people that Tremolite is not an asbestosiform mineral. This concept seems contrary to every known text written on the subject.

I am not personally acquainted with any of the physicians. Dr. Kleinfelt certainly has a good reputation and it is my understanding that he is still connected with a state agency. Dr. Klingerman is a dermatologist and would be of limited value in pulmonary work. The attached CV for Dr. Schepers is rather impressive. However, the also attached reprint leaves much to be desired. Since Dr. Schepers has spent some time at Saranac Lake, perhaps George Wright could evaluate his usefulness in this area.

The one decision which must be made before June 15, is whether J-M wants to continue to participate at a cost of \$300. It is my recommendation that we participate in this group at least until they are able to better define their goals.

W. B. Reitze

cc:w/attach

W. L. Vanderbeek - Dvr
H. Kranich - Dvr
E. M. Fenner - Dvr
T. M. Jackson - Dvr

Hugh Robinson

*Amelaine Vitar
employment record*

CRMC-MAD-000907

LA112

*Copy held for
minutes of mtg
held 6/11/72 - nyc
and return file
JPR*

Celita DRQ
May 10, 1972

W. L. VanDerbeek

MEETING OF TALC PRODUCERS

W. B. Reitze's Letter of April 28, 1972 to H. M. Jackson

The writer has reviewed with E. M. Fenner subject report. It was agreed with Mr. Fenner that nothing further would be done prior to the next meeting of the group in the R. T. Vanderbilt offices in New York City early in June.

I am giving a copy of Mr. Reitze's report to A. B. Marchant. For Mr. Reitze's information, I believe that the matter of consideration and follow-up on environmental control, dust control, workmen's compensation, etc. have been initiated with Mr. Marchant's people and the work that has been initiated will be closely followed.

P. A. Martinson

CC:

H. M. Jackson
W. B. Reitze
E. M. Fenner
T. M. Jackson
H. Kranich
A. B. Marchant w/attachment
D
C

CRMC-MAD-000908

1 A 112

Mr. Peter McCarthy, Exec. V. P.
International Talc Company
420 Lexington Avenue
New York, N. Y. 10017

Mr. Frank Kuchl
International Talc Company
420 Lexington Avenue
New York, N. Y. 10017

Mr. Robert McCarthy
International Talc Company
420 Lexington Avenue
New York, N. Y. 10017

Mr. William Stephenson
Director of Marketing
R.P.M. Division
Rizer, Inc.
155 East 42nd Street
New York, N. Y. 10017

Mr. Alan J. Dankworth
Product Manager, Industrial Products
Engelhard Minerals & Chemicals Corp.
Lenox Park
Edison, New Jersey 08817

Mr. Page Gentch
United Sierra Division
Cyprus Mines Corporation
180 Scotch Road
Monton, New Jersey 08628

Mr. Woodward Glenn
Southern Talc Company
Chatsworth, Georgia

Mr. Peter Bixby
American Talc Company
Summit, New Jersey

Mr. Donald Ferry, Vice President
American Talc Company
Summit, New Jersey

Mr. Lawrence Driscoll
Whittaker, Clark & Daniells
1000 Coolidge Street
So. Plainfield, N. J. 07080

Mr. Frank Zimmerman
National Gypsum Company
325 Delaware Avenue
Buffalo, New York

Mr. Earl Smith, Exec. V. P.
Desert Minerals
1891 South Coast Highway
Laguna Beach, California 92651

Mr. Norman Scheffel, V. P.
Technical Service
Desert Minerals
1891 South Coast Highway
Laguna Beach, California 92651

Mr. Roger Miller
Windsor Minerals
P. O. Box 680
Windsor, Vermont 05080

Mr. William B. Reitze, Manager
Accident Prevention & Health
Administration
Johns-Manville Corporation
270 Madison Avenue
New York, N. Y.

Mr. H. B. Vanderbilt Exec. V. P.
R. T. Vanderbilt Company, Inc.
230 Park Avenue
New York, N. Y. 10017

Mr. R. C. Bacon
R. T. Vanderbilt Company, Inc.
230 Park Avenue
New York, N. Y. 10017

Mr. Paul B. Gibney, Attorney
Davis, Gilbert, Levine & Schwartz
500 Fifth Avenue
New York, New York

CRMC-MAD-000909

R. T. VANDERBILT COMPANY, INC.
33 WINFIELD STREET
EAST NORWALK, CONNECTICUT 06855

CABLE ADDRESS
BILTVAN NEW YORK

April 18, 1973

Mr. Richard Carter
Counsel
Johns-Manville Corporation
5680 South Syracuse Circle
Denver, Colorado 80217

Dear Dick:

Paul Gibney asked me to send you our latest revision of the
FDA talc comment. Attached are all documents except the book of microphotographs
and Dr. W. E. Smith's report, which I believe you already have.

Very truly yours,

R. T. VANDERBILT COMPANY, INC.

al

Allan M. Harvey, Manager
Patent and Legal Liaison Department

AMH: sb
Enclosure

RECEIVED
APR 19 1973
LEGAL SERVICES
CRMCMAD-000910

R. T. VANDERBILT COMPANY, INC.

33 WINFIELD STREET

EAST NORWALK, CONNECTICUT 06855

April 17, 1973

CABLE ADDRESS
BILTVAN NEW YORK

Mr. Alan T. Spiher, Jr.
Chief, GRAS Review Branch
Division of Petitions Processing
Bureau of Foods
200 C Street, S. W.
Washington, D. C. 20204

Dear Mr. Spiher:

We are sending you the attached documents pertaining to the "Proposal Regarding Regulation of Prior-Sanctioned Food Ingredients" (37 F.R. 16407) at the request of Dr. Corbin Myles, with whom we have been in telephone contact regarding our petition for an extension of time for comment.

We sincerely appreciate the opportunity to elaborate on the question of possible health hazards of industrial talcs. It is important that the true medical and mineralogical facts of the situation be known and well understood.

In the discussion preceding the proposed talc amendment it is stated that it is prudent to require that talc which is to be used in the manufacture of food and food packaging be free of "asbestos-form particles". Certain medical reasons for this judgment are given. Our studies of talc have shown that great care must be taken to define the term "asbestos-form particle" in order to avoid a prejudicial attitude toward the majority of the industrial talcs sold today, especially when so little evidence of physiological harm has been exhibited.

It is true that no firm mineralogic definition of commercial talc exists today, but the majority of talcs that are useful in food packaging materials consist essentially of the two minerals, talc and tremolite. Talc mines almost always contain a wide variety of silicate minerals, some of which are considered asbestos, as defined in the discussion to follow. When true asbestos minerals are present, it is often possible to selectively mine the talc portion of the orebody without extracting the asbestos minerals, and this is being done. The tremolitic talcs used in food packaging materials can be considered to be truly free of fibrous particles, and therefore, by inference, free of hazard in the particular context under discussion.

What has confused the issue, both here and in the reasoning behind regulations promulgated by other government departments, is the peculiar placement of the mineral tremolite in the category of asbestos. Unfortunately tremolite has been portrayed as a fibrous mineral more as a result of its similarity in chemical composition to true asbestos minerals than because of any similarity in physical form. A study of the attached set of photomicrographs and a consideration of the following interpretation of asbestos mineralogy will prove that tremolite should not be categorized as asbestos without some sort of qualification such as "tremolite asbestos" or "fibrous tremolite", with the true meaning of "fibrous" and "asbestos" properly defined.

CRMC-MAD-000911

Mr. Alan T. Spiher, Jr.

- 3 -

April 17, 1973

non-fibrous varieties of the other asbestos minerals, i.e. antigorite, riebeckite and cummingtonite from the asbestos standard, that if special names had existed for the fibrous varieties of the remaining amphiboles, they would have been included as well, and anthophyllite, tremolite and actinolite would also have been omitted. This distinction between the fibrous and non-fibrous forms of serpentine and the amphiboles under discussion, is substantiated by the references cited in Appendix A-1.

The accompanying set of photomicrographs (Appendix A-2) illustrates conclusively the inaccurate placement of the mineral tremolite per se in the category of asbestos. It would make as much sense to include the minerals riebeckite and cummingtonite in the category of asbestos, since the shape and distribution of their crystal shapes are almost identical with those of actinolite, tremolite and non-fibrous anthophyllite.

If we turn to a consideration of the medical aspects of the talc situation, some light can be thrown on the reasons behind the indictment of talc as a suspicious mineral and tremolite as a "bad actor". As far back as 1955 Dr. G. W. H. Schepers reported on the effects of talc dust on the human lung in a study of tremolitic talc miners in Western New York State. Later, in the 1960's Dr. Morris Kleinfeld made epidemiological studies of talc miners and millers in New York State. Although their findings were not conclusive, and no scientific evidence of any carcinogenicity of talc per se was disclosed, they did throw a certain amount of suspicion on tremolite and talcs in general. Unfortunately, these studies not only have cast a prejudicial light on the question of biological response to commercial talcs, but have resulted in the lumping together of tremolite and the "fibrous" form of talc with dangerous types of asbestos such as crocidolite, that have been proven definitely harmful.

It was because of the uncertainties of various epidemiological studies that Dr. W. E. Smith, working in the Health Research Institute at Fairleigh Dickinson University in Madison, New Jersey, embarked on a project to study the carcinogenicity of various mineral dusts, using the hamster as a suitable, experimental animal model. A copy of Dr. Smith's report is enclosed as Appendix B. The tremolite talc (#14) in Dr. Smith's project is a New York State talc containing 50% tremolite, 10% antigorite, 2-5% chlorite, and 35% talc, with a median particle size of 8.5 microns. A photomicrograph of the sample reveals the usual distribution of rods, nodules, plates and short acicular particles characteristic of New York State talcs. The lack of pleural tumors in animals injected with this talc is significant when a comparison is made with the results from animals injected with true asbestos.

More recently, Dr. Schepers, now Chief, Medical Services, at the Veterans Hospital, Lebanon, Pennsylvania, has come forth with a new consideration of the relative hazards of various silicate minerals. Dr. Schepers has written a letter (see Appendix C) to Mr. R. C. Bacon, former Director of Mining Operations, R. T. Vanderbilt Company, Inc., in answer to a request for the chest surgeon's latest opinions on talc and asbestos in the light of all the investigations that have taken place in this area since the early 1950's. You will note that Dr. Schepers applies

R. T. VANDERBILT COMPANY, INC.

Mr. Alan T. Spiher, Jr.

- 4 -

April 17, 1973

different ratings of hazard to each type of silicate mineral, and that tremolite comes closer to talc than to the true asbestos minerals. We find the same regard for the degree of hazard indicated in regulations concerning silicate and asbestos minerals in Great Britain, where experience with various forms of asbestos is probably greater and of a longer time period than any other industrial nation. It is not surprising that Dr. Smith finds a varied biologic response to different types, dosages and shapes of silicate mineral dusts, but it is surprising and unfortunate that hygienists and medical consultants in this country continue to disregard the wide differences in degree of hazard of the substances for which government regulations are laid down.

In conclusion, it should be stressed that a valuable, economic product is in jeopardy of being penalized for lack of adequate definition when no conclusive evidence of hazard has been disclosed. We maintain that the tremolite found in tremolitic talcs is not asbestos and, therefore, no more hazardous than talc itself. However, unless a realistic definition of the term "asbestos-form particle" is rendered, not only a great portion of the pure talc being sold today but also those talc products containing even the slightest proportion of the talc-like mineral tremolite will be eliminated from food packaging materials. It is even possible to foresee the elimination of all mineral dusts from the role of fillers and coatings for these materials if the term "asbestos-form particle" is misinterpreted or stretched to include particles of certain shapes regardless of chemical composition.

Very truly yours,

R. T. VANDERBILT COMPANY, INC.

Allan M. Harvey, Manager
Patent and Legal Liaison Department

AMH: sb

Enclosures

P.S. In our original request for additional time in which to comment on the proposed talc amendment, we referred to proposed studies of talcs by x-ray diffraction techniques. Considerable work was done but no meaningful contribution to the problem of defining "asbestos-form particles" was generated since this means of identification does not differentiate between asbestos-form and non-asbestos-form minerals. However, since the proper identification of various types of minerals to be found in talcs normally used in food packaging materials is critical, our opinion regarding a satisfactory method is expressed in the accompanying statement (Appendix D).

CRMC-MAD-000913

Bibliography of Asbestos Terms

1. "In the mineralogical sense the term asbestos is extended in part also to other fibrous minerals, without reference to composition, structural constitution, properties, and technical-industrial significance. Two main groups are differentiated with respect to origin, mode of formation, mineralogical relationships, structure, composition, and properties of the asbestoses: namely, the serpentine asbestoses (chrysotiles) and the amphibole asbestoses. The fibrous crystalline variants of the minerals have in part been given individual names to which, in the interest of a precise terminology, the word asbestos must not be appended. For example, the fibrous form of serpentine is called chrysotile, serpentine-asbestos, or fibrous serpentine - but NOT chrysotile asbestos. The accepted names of the five asbestoses used commercially are given as follows:

<u>Group</u>	<u>Designation of Mineral</u>	<u>Designation of Asbestos</u>
Serpentine Asbestos	Serpentine	Chrysotile
Amphibole Asbestos	Riebeckite	Crocidolite, Blue Asbestos
	Gruenerite	Amosite
	Anthophyllite	Anthophyllite Asbestos*
	Tremolite	Tremolite Asbestos*

*These varieties have no special designation."

(Reference: Berger, Hans, trans. by Ralph E. Osper, Asbestos Fundamentals - Origins, Properties, Mining, Processing, Utilization Chemical Publishing Company, Inc., New York, 1963.)

* * * * *

2. "Asbestos is the common name given to a number of inorganic, fibrous, silicate minerals that possess a crystalline structure. Chrysotile, the most abundant of these fibrous silicates and the one most extensively used in industry, belongs to the serpentine group of rock-forming minerals and is mined mainly in Canada, Russia, and Rhodesia. The other forms of asbestos belong to the amphibole group. They are crocidolite, commonly known as 'blue asbestos' which is found in South Africa; Western Australia and Bolivia; amosite which occurs only in South Africa; anthophyllite, the fibrous form of which is found in Finland and Africa; and the fibrous forms of tremolite (available in Italy) and actinolite, which has been found in South Africa."

"'Asbestos' means any of the following minerals, that is to say, crocidolite, amosite, chrysotile, fibrous anthophyllite and any mixture containing any of the said minerals."

(Reference: Health and Safety at Work #44, Asbestos Health Precautions in Industry, Department of Employment, HM Factory Inspectorate, United Kingdom, 1971.)

* * * * *

CRMC-MAD-000914

3. "Asbestos, 'amphibole' asbestos, 'hornblende' asbestos, and 'Italian' asbestos are various terms given to the monoclinic amphiboles, tremolite $\text{Ca}_2\text{Mg}_5(\text{Si}_8\text{O}_{22})(\text{OH},\text{F})_2$ and actinolite, $\text{Ca}(\text{Mg},\text{Fe})_2(\text{SiO}_3)_4$, when they occur in fine silky fibers."

(Reference: Ladoo, Raymond Bardeen, Non-Metallic Minerals, 1st Edition, McGraw-Hill, New York, 1925.
Ladoo, Raymond Bardeen, and W. M. Myers, Non-Metallic Minerals, 2nd Edition, McGraw-Hill, New York, 1951.)

* * * * *

4. "Actinolite. Calcium-magnesium-iron amphibole.....In crystals, either short- or long-bladed, as in tremolite; columnar or fibrous; granular massive.... The fibrous and radiated kinds are often called asbestiform actinolite and radiated actinolite.....ASBESTOS. Asbestos. Tremolite, actinolite, and other varieties of amphibole, excepting those containing much alumina, pass into fibrous varieties, the fibers of which are sometimes very long, fine, flexible, and easily separable by the fingers, and look like flax. These kinds are called asbestos (from the Greek for incombustible).....CROCIDOLITE. Blue Asbestos -- Probably to be considered as a fibrous variety of riebeckite. Fibrous, asbestos-like; fibers long but delicate and easily separable."

(Reference: Dana, Edward Salisbury, A Textbook of Mineralogy with an Extended Treatise on Crystallography and Physical Mineralogy, John Wiley & Sons, Inc., New York, 1947.)

* * * * *

5. "Serpentine occurs in two distinct forms: (1) a platy variety, antigorite, which conforms in its properties to those of the phyllosilicates, and (2) a fibrous variety, chrysotile."..."The variety chrysotile is the chief source of asbestos. The uses of asbestos depend upon its fibrous, flexible nature, which allows it to be made into felt and woven into cloth and other fabrics, and upon its incombustibility and slow conductivity of heat. Asbestos products, therefore, are used for fireproofing and as an insulation material against heat and electricity. Massive serpentine, which is translucent and of a light to dark green color, is often used as an ornamental stone and may be valuable as building material."

(Reference: Hurlbut, Cornelius S. Jr., Dana's Manual of Mineralogy, 18th Edition, John Wiley & Sons, Inc., New York, 1971.)

* * * * *

6. "Amosite: A commercial term for an iron-rich, asbestiform variety of amphibole occurring in long fibers. It may consist of an orthorhombic amphibole (anthophyllite or gedrite) or of a monoclinic amphibole (cummingtonite or grunerite)."

"Asbestos: A commercial term applied to a group of highly fibrous silicate minerals that readily separate into long, thin, strong fibers of sufficient flexibility to be woven,.....certain fibrous varieties of amphibole..."

"Crocidolite: A lavender-blue, indigo-blue, or leak-green asbestiform variety of riebeckite, occurring in silky fibers and in massive and earthy forms. Syn: Blue asbestos: Krokidolite."

(Reference: Gary, Margaret, R. McAfee, Jr., and C. L. Wolf, Glossary of Geology, American Geological Institute, Washington, D. C., 1972.)

* * * * *

7. "Riebeckite also occurs as an extremely fibrous mineral, when it is known as blue asbestos or crocidolite. The best known occurrences of blue asbestos are in South Africa where it occurs in bedded ironstones, the seams of crocidolite conforming to the bedding of the ironstones. The composition of the crocidolite is remarkably similar to that of the ironstone and the crystallization of the amphibole, initially in the form of massive riebeckite, occurred with little or no addition of material under conditions of moderate temperature and pressure consequent on the burial of the ironstones to moderate depth."...."Both Peacock (1928) and Hall (1930) favour the hypothesis that Na_2O was originally uniformly distributed throughout the ironstone and subsequently concentrated in certain bands. The later transformation of the massive riebeckite to the fibrous crocidolite may result from the instability of the riebeckite during a period when the ironstones were subjected to shearing stress.".....The members of the cumingtonite-grunerite series are typically found in both regionally and contact metamorphosed rocks. The more magnesian members are found also in some igneous rocks, including those of hybrid origin. The asbestiform varieties amosite and montasite are of economic importance."...."The characteristic habit of the members of the cumingtonite-grunerite series is acicular or fibrous. The asbestiform variety, amosite, when fresh is ash-grey in colour; the mineral, however is frequently coated with iron oxides, when the colour is brown to yellow. The fibres of the montasite variety are less harsh than amosite and are often soft and silky in texture."...."The habits of the anthophyllite minerals vary from fibrous and asbestiform to bladed and prismatic. The fibers of anthophyllite asbestos generally do not have any great tensile strength and are of less economic importance than the amosite and crocidolite fibres."....."Mass-fiber anthophyllite asbestos occurs as a replacement mineral in ultrabasic rocks at Kamiah, Idaho (Anderson, 1931).".....Laudermilk and Woodford (1930) have described an asbestiform anthophyllite in veins in serpentinite at Coffe Creek, Carville, California."

(Reference: Deer, W. A., R. A. Howie, and J. Zussman, Rock Forming Minerals, Volume 2, Longman Group Ltd., London, 1963.)

* * * * *

8. "The principal minerals of the serpentine group all have the approximate composition $H_4Mg_3Si_2O_{10}$, and comparatively little substitution of other irons is found to occur in natural specimens. The most well known serpentine mineral, chrysotile, often occurs in veins of silky fibers and is the most important source of commercial asbestos."

(Reference: Deer, W. A., R. A. Howie, and J. Zussman, Rock Forming Minerals, Vol. 3, Logmans, Green and Co. Ltd., London 1962.)

* * * * *

9. "Mineralogically, asbestos includes the fibrous forms of amphibole; the fibers are generally very long, fine, flexible, and easily separated by the fingers; the color..... The term asbestos in the strictest sense is confined to the fibrous forms of actinolite, but the asbestos of commerce includes fibrous varieties of a number of silicates...."

(Reference: Read, H. H., Rutley's Elements of Mineralogy, 25th Edition, Thomas Murby & Co., London, 1953.)

* * * * *

10. "Tremolite does not break down into fibers that approach a uniform rectangular cross section, as crocidolite does. Two samples (figs. 9 and 10) indicate that the fibers break into fragments. Some of the fragments are quite thin, while others are rather thick. The fragments are composed of thin sheets. Some of the small sheets (fig. 9) are so thin that they are almost translucent to the electron beam. Dark streaks are again noticeable in the thin sheets of tremolite, as they are slightly wrinkled for Bragg reflections. The thin sheets are probably less than 100 A. in thickness."

"Actinolite is generally considered the basic amphibole asbestos member. The fibers of actinolite are quite poor; and, because it rarely has commercial value, it is not very well known. The sample examined was splintery and very brittle. It was not expected that the mineral would break down into fibers for electron microscopic study, but we felt it worth the effort to try, since it is the basic member of the amphibole group. Figure 11 reveals that it did not break into single fibers. Low magnification was used, as the material broke into large, opaque pieces."

(Reference: Huggins, Charles W., Electron Micrographs of Asbestiform Minerals, Report of Investigations 5551, Bureau of Mines, U. S. Department of The Interior, 1959.)

* * * * *

11. "The name 'asbestos' is used to describe any mineral that breaks down into fibers when it is crushed or processed."

(Reference: Gaze, Richard, "The Physical and Molecular Structure of Asbestos," Ann. N.Y. Acad. Sci., Art. 1, 132, pp. 23-30 1965.)

* * * * *

12. "Asbestos: 'Asbestos' is the name given to a group of hydrous magnesium silicate minerals which have a fibrous texture. The crystal structure of these minerals is characterized by the presence of long chains of silicate tetrahedra which can be readily cleaved in directions parallel to the silicate chains but not in directions that cut the chains, with the result that these minerals can be shredded into fibers..."

(Reference: Kingery, W. D., Introduction to Ceramics, John Wiley and Sons, Inc., New York, 1963.)

* * * * *

13. "Asbestos is not a distinct material but a commercial term used to express the fibrous nature of several minerals."

(Reference: United States Bureau of Mines, Foreign Minerals Division, Mineral Raw Materials, p. 16, McGraw-Hill Book Company, Inc., New York, 1937.)

* * * * *

14. "Asbestos, any of several varieties of fibrous minerals whose fibres may be spun or felted to make fabrics, panels, or coatings that are resistant to heat and chemical action. Asbestos is also valued for its electrical insulating properties."

(Reference: Colliers Encyclopedia - 1972.)

* * * * *

15. "Asbestos, general name for a group of silicate minerals that occur as fibers or fibrous masses and that can be woven into heat resistant materials. The fibers are separated mechanically and pressed, spun, or woven, often with cotton, wire, rubber, or cement, to produce fireproof articles of all types: clothing, curtains, electric cable insulation, brake linings and clutch facings, insulating boards, sheets, shingles and talcs."

* * * * *

16. "Asbestos is a fibrous mineral substance... In its natural state, asbestos is found encased in rocks. Its fibrous quality makes it a remarkable mineral. Asbestos is as dense as the rock in which it is encased, but it is a mass of tiny fibers that become as fluffy and light as thistledown when separated mechanically from rock."

(Reference: Encyclopedia Americana - International Edition - 1959.)

* * * * *

17. "Fibre - A fibre may be defined as a unit of matter of hair-like dimensions whose length is at least 200 times greater than its width."

(Reference: Enclyopedia Britannica - 1971.)

* * * * *

March 23, 1973

S. Lincoln Avenue
Lebanon, PA 17042

R. C. Bacon
Director, Research and Development
R. T. Vanderbilt Company, Inc.
33 Winfield Street
East Norwalk, Connecticut 06855

Dear Mr. Bacon

RE: Talc (0) Tremolite (10), Chrysotile (2+),
Anthophyllite (3+), Amosite (4+),
Crocidolite (10+) etc

Thanks for consulting me about these items. As you know from my publications I have had considerable experience in decoding the biological action of the fibrous silicates. This is based both on elaborate inhalation experiments, human exposures with necropsy studies, and of course review of the literature.

The order in which I have listed these fibrous minerals represents my interpretation as to their capacity for inducing biological responses. Talc is listed first and given a zero rating since it is in pure form, practically innocuous except for overwhelming prolonged exposure. The latter is no longer permissible in the USA so, for practical purposes, this substance is harmless.

Crocidolite, by contrast, is listed last and given a 10+ or maximal rating. It can with relatively minor exposure, produce exceedingly serious and progressive changes in the lungs or wherever it becomes lodged. One of these effects is the capacity to produce neoplastic disease.

Talc, Tremolite and Chrysotile need to be discussed a little more fully.

Pure mineral talc of the non-tremolite kind, does not induce a tissue response of any clinical significance. If there is prolonged exposure the lung alveoli and some lymphatics can trap phagocytic cells which ingested the talc particles and this may block out their functions temporarily. This type of pathology is called a thesaurosis or storage effect. It is usually reversible on cessation or decrease of exposure and no significant permanent after-effects result.

The same applies for tremolite talc. It is inert like Georgia talc and induces only a thesaurosis effect when there is excessive prolonged exposure. However, Tremolite sometimes is "contaminated

R. C. Bacon

March 23, 1973

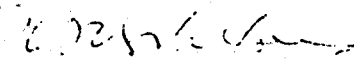
with chrysotile or other true asbestos type fibrous minerals. When this is the case, the thesaurosis becomes a thesaurismosis ie. the alveolar walls and perilymphatic tissues begin to react, and fibrous tissue forms. This is due to the asbestos fibers and not the tremolite component. The fibrotic response is directly proportional to the ratio of asbestos fibers admixed with the tremolite. You will note from one of my experiments that when small quantities of chrysotile were mixed with gypsum the chrysotile effect never-the-less prevailed despite dilution with the inert gypsum.

This sounds like I make chrysotile out to be a bad actor. It is true that prolonged exposure to chrysotile will produce asbestosis but of a relatively mild kind. In comparison, however, with what Crocidolite does, Chrysotile is a relatively tame beast. There are a number of persons currently making excessive propaganda about Chrysotile. Their noise tends to drown out the voices of sanity. The hullabaloo will of course go on for some time. Progressively, however, the evidence is coming in that Chrysotile causes only a fine interstitial fibrosis without blocking off the respiratory surfaces. The patient develops some disability because of stiffening of his lungs, but can survive for a long time with fairly good gas exchange. I have never yet seen a case of lung cancer caused by Chrysotile alone and no one else has ever been able to show me a case either. In mixed sequential exposure experiments with beryllium sulfate as a potent carcinogen and Chrysotile as a potential co-carcinogen, the surprise finding was that Chrysotile acted as an anti-carcinogen.

Of course, if one mixes Chrysotile with Amosite, Crocidolite or Silica exposures, bad effects follow - read bad. Possibly this is why Chrysotile got a bad name.

I hope this summary is of help to you. If I can provide more detail, please let me know.

Sincerely,


GERRIT W. H. SCHEPERS, M.D., D.Sc.

CRMC-MAD-000921

APPENDIX D

X-RAY DIFFRACTION ON TALCS AND TALC MINERALS

X-ray diffraction studies of the serpentine polymorphs, chrysotile, antigorite, and lizardite indicate that the presence of this group can be detected at levels of approximately 1% in spiked samples but this presence in an unknown mixture cannot be verified until levels approximate 3-5%, particularly with the presence of chlorite group minerals. The individual polymorphs cannot be distinguished, fibrous vs. non-fibrous forms, until much higher levels are obtained (25%) and even then with difficulty.

The same holds true for the amphibole group. At the 1% level, the presence of a member of this group could be detected (or at least suspected) but higher levels must be present before specific species could be identified. In particular, it is very difficult to distinguish between fibrous and non-fibrous forms of the same mineral by this method, i.e., crocidolite vs. riebeckite.

Yet, X-ray diffraction is the only generally available method of qualitative and quantitative mineral phase determinations of industrial minerals. It is, therefore, strongly urged that X-ray diffraction scanning be designated as the primary screening instrument in the detection of suspected asbestos minerals. If reflection peaks are present in areas which are indicative of serpentine or amphibole group minerals, light microscopy with a petrographic microscope should be used to identify the particular phase present and determine, if possible, its general morphology, i.e. fibrous or non-fibrous. Further identification and morphological determination could be gained using dispersion staining and phase contrast microscopy.



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
FOOD AND DRUG ADMINISTRATION
WASHINGTON, D.C. 20204

March 2, 1973

Dr. Lucile Adamson, Staff Scientist
Mr. Scott Lang, Washington Counsel
Environmental Defense Fund
1712 N Street, N.W.
Washington, D.C. 20036

Dear Dr. Adamson and Mr. Lang:

I regret the long delay in replying to your letter about asbestos in talc. Part of the delay was due to a heavy load of other responsibilities, and part was due to a hope that events might have proceeded to the point of resolution of the various questions involved. Even though this hope has not yet been realized, the lapse of time has been great enough to impel me to write as follows in response to your specific questions.

Your remarks on the health hazards of asbestos are of course well-founded; this has been of concern to us for some time. In August 1971 I organized a discussion session at FDA on asbestos in talc, which was attended by almost fifty representatives of industry, universities, and government. A major topic at the meeting was the analytical methodology for detecting small amounts of asbestos in talc. This was recognized as a difficult problem which is best attacked by a battery of four methods (optical microscopy, X-ray diffraction, electron microscopy, and electron diffraction) and possibly a fifth method, elemental analysis by electron microprobe. However, it was noted that the combined use of all the methods would be almost prohibitively expensive.

One of those in attendance at the meeting was Prof. Seymour Z. Lewin of New York University, a recognized expert on mineralogical chemistry and analysis. Some time after the meeting, I asked Dr. Lewin to undertake the analysis of samples of commercial talcum powder products for asbestos (particularly the chrysotile and tremolite varieties) by means of the X-ray diffraction technique primarily, with additional work by optical microscopy as needed. He carried out most of this work during 1972; to date he has examined 195 samples of talcum powders plus some miscellaneous samples for others at FDA.

Dr. Lewin has given us reports on his results from time to time, but we do not yet have a truly final report from him. Until we receive it, we cannot publicize the incomplete information in our possession. Dr. Lewin has written that the final report will be ready "within a few weeks" but he is a very busy man and our past experience suggests that it may not arrive until a few months from now.

CRMC-MAD-000923

I hold a high regard for Dr. Lewin and the scientific quality of his work; of course, it is always necessary to maintain a critical attitude towards the results obtained by sophisticated analytical techniques. This has been particularly true in the present case, where the small amounts of asbestos involved, and the presence of transitional and altered mineralogical species, led to ambiguities in the data. In his eagerness to protect the public interest to the fullest extent, Dr. Lewin in certain cases interpreted borderline results as showing the presence of asbestos, in his earlier reports, but he later used a more conservative interpretation. He has spent a lot of time and energy in creative scientific work aimed at resolving the ambiguities (for which the public and FDA owe him a debt of gratitude) and he has succeeded for the most part. As you may know, some discussion of Dr. Lewin's earlier interpretation of the data was included in an article on asbestos in the Wall Street Journal of February 26, 1973.

Inasmuch as Dr. Lewin's results are judged acceptable, subject to the above comments, we have not undertaken a repeat survey. Because of the possibility that optical microscopy alone may constitute an acceptable technique for the detection of asbestos in talc (and is more generally available than X-ray diffraction) we are currently making a comparison between Dr. Lewin's results on selected samples and the results obtained by in-house FDA microscopists. After this comparison work is completed, a decision will be made as to the preferred procedure for detection of asbestos in talc. Details of the analytical procedure are needed for the official statement which FDA plans to issue on asbestos contamination of talc.

One more point should be noted, that FDA activities have already led to a substantial upgrading of the quality of talc used in cosmetic products. This is evident both from the results obtained by Dr. Lewin upon re-analyses of a given product where repeat purchases were made at retail over a period of time, and also from discussions with a principal supplier of talc who indicates that he now sells only asbestos-free grades of talc to the cosmetics industry.

With reference to your last question, FDA has undertaken extensive literature surveys on the carcinogenicity of asbestos and of talc, but the results thus far do not establish that talc itself is carcinogenic. We also have had discussions with members of the National Cancer Institute, where work is currently underway on carcinogenesis by fibers and minerals as well as other chemicals. As you probably realize, the mission and facilities of the National Cancer Institute are more appropriate than those of FDA for resolving the question of the possible carcinogenicity of pure talc; also, a period of many years will be needed to obtain the answer.

CRMC-MAD-000924

LA112

11 0550

Page 3 - Dr. Lucile Adamson and Mr. Scott Lang

I trust that the above information satisfies your needs, and again express regret for the delay.

Sincerely yours,

Alfred Weissler

Alfred Weissler, Ph.D.

Acting Director

Division of Colors and Cosmetics Technology

Office of Product Technology

CRMC-MAD-000925

LA112

11 0551

Mr. Smith,

I have single for you at Greenwood Inn - arrival October 2, departure October 4.

Celite DHQ
September 22, 1972

Kay

W. L. VanDerbeek
E. M. Fenner
H. M. Jackson
W. B. Reitze
~~E. B. Smith~~ - Long Beach
N. B. Scheffel - Philadelphia
R. P. Carter
S. Speil
H. G. Donovan

EJE		RSL	X	RFB	
FBS	X	NBS		SRM	
TER		JEC		DEN	
SEP 20 1972					
DDT		AJM		KJB	
RON		DHM		TJF	

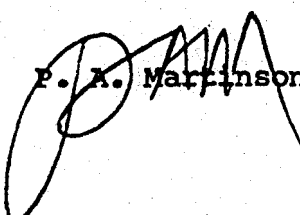
*Hand del'd to
EBS in
Wenue*

MEETING CALL
Talc: FDA-OSHA Matters

Celite Conference Room - Plaza West - Second Floor
1:30 PM Monday, October 2, 1972
~~Agenda to be issued by E. B. Smith, Chairman.~~

Of particular concern:

1. Action to take (J-M alone or in concert with other talc industry people i.e., R. T. Vanderbilt, Sierra, International Talc, etc.) on proposed FDA regulations.
2. Further industry action related to OSHA regulations (asbestos fiber, tremolite, etc.)
3. Technical consideration for issuing statement to customers covering Desertalc relative to tremolite presence and vs. competitive products. FDA related.


P. A. Martinson

D
C

CRMC-MAD-000926

To: E. M. Fenner - 4N ~~←~~

Date: June 19, 1973

From: Richard Carter

Copies: See below.

Subject:

98

Enclosed is a copy of a letter dated June 13, 1973 from the Environmental Protection Agency to the National Paints and Coatings Association, a copy of which was sent to me by Bob Bacon of R. T. Vanderbilt.

It is my understanding that we were previously informed by the EPA that it was not their intention to apply their new asbestos emission standards to talc. The attached letter now affirms at least part of this understanding and states that the standards were never intended to cover the manufacturing of paints or coatings when commercial or industrial talc is used as an ingredient.
→ Bob Bacon has advised me that the EPA is presently drafting a similar letter stating that the standards were never intended to cover talc mining and milling operations. As soon as Bob Bacon receives this latter letter, he will forward a copy to me and I will distribute it.

Bob Bacon indicated to me in a telephone conversation last week, that he is planning to meet with OSHA this week to obtain a similar modification to the OSHA asbestos dust standard.

R.G. RIEDE C.A. CARLSON R.F. BASSETT

[Handwritten signature]

cc: D. E. Hillier
H. R. Keefe
E. F. Marriner
W. B. Reitze
E. B. Smith
F. J. Solon, Jr.
W. C. Streib
G. W. Wright

These documents for your further information. It appears that talc operations may yet be ruled exempt from EPA Asbestos Standards through amendment of NESHAPS (40 CFR 61).

In the interim, it is probably advisable that we cover ourselves by submittal of Compliance Status Reports according to the instructions we received from Mr. O'Connell of Region IX; especially since we need to make no control commitment beyond the project already in progress at Dunn.

If the Asbestos Standard is amended, our reports will become obsolete.

[Handwritten signature]

Desert Minerals, Inc. - Long Beach
October 17, 1972

E. M. Fenner
H. M. Jackson
W. B. Reitze
P. A. Martinson
H. R. Keefe
R. P. Carter
R. F. Bassett
R. S. Lamar
E. J. Ellsworth

R. L. VANDERBILT LETTER TO FDA RE POSTPONEMENT PROPOSED
REGULATIONS.

Here is a copy of the letter submitted to the FDA by Mr. Paul Gibney
representing R. L. Vanderbilt concerning their request for an extension
of 120 days in which to file comments.

Earl B. Smith
EBS:jec
Encls.

A. M. DAVIS (1906-1971)
A. M. GILBERT
JOSHUA LEVINE
PHILIP K. SCHWARTZ
PATRICIA HATRY
THEODORE A. KAUFMAN
PHILIP S. REISS
PAUL B. GIBNEY, JR.
ROSS L. GILBERT
LEONARD ORKIN
SOLOMON P. FRIEDMAN
MARTIN A. REMNITZ
GERALD B. SCHWARTZ
MILES BAUM
ALAN D. KROLL
STUART LEE FRIEDEL
MICHAEL D. DITZIAN

* MEMBER OF MARYLAND & D.C. BARS ONLY

DAVIS, GILBERT, LEVINE & SCHWARTZ

500 FIFTH AVENUE, NEW YORK, N.Y. 10036

E.E.	☒	FOL	☒	RFB	
EFS	☒	-	☒	SPM	
TER		JEC		DEN	
OCT 18 1972					
T		AJM		KIB	
UN		DHM		TJF	

HOWARD P. PECK
COUNSEL

CABLE ADDRESS
"DAVANOIL"

TELEPHONE
AREA CODE 212
664-0500

October 5, 1972

+ Xerox to: EMF
HMS
WBR
DAM
HRT
RFB
RFB
RSL

Hearing Clerk
Department of Health, Education and Welfare
Room 6-88
5600 Fishers Lane
Rockville, Maryland 20852

Dear Sir:

We are attorneys for R. T. Vanderbilt Company, Inc. and its subsidiaries, Gouverneur Talc Company, Inc. and Western Talc Company, Inc., with offices at 230 Park Avenue, New York, N. Y., and for International Talc Co., Inc., a corporation with offices at 420 Lexington Avenue, New York, N. Y. Vanderbilt and International are unrelated to one another. Each of the afore-said companies is a miner and producer of talc.

Reference is made to the "Proposal Regarding Regulation of Prior-Sanctioned Food Ingredients" (21 CFR Part 121), published in the Federal Register of August 12, 1972 (37 F.R. 16407).

Our clients have noted with great interest the proposal to ban talc "containing asbestos-form particles" from food packaging. We note from the September 22, 1972 letter of the Director of the Office of Product Technology to Mr. P. F. McCarthy that the afore-said proposal is directed against fibrous forms which distinguish asbestos from talc.

Talc produced in the United States generally contains tremolite, and this mineral has too often been classified with asbestos, which is truly a fibrous material. Our clients wish to establish, not only for the benefit of the Food and Drug Administration, but also for the benefit of other federal agencies asserting jurisdiction on the general question of asbestos, that the tremolite contained in talc seldom occurs in a fibrous form. Assuming the establishment of this fact to your satisfaction, non-fibrous tremolitic talcs should therefore be without the field of your concern.

Furthermore, it seems that there exists a great deal of confusion over the mineralogical natures of true asbestos and other minerals

CRMC-MAD-000929

DAVIS, GILBERT, LEVINE & SCHWARTZ

October 5, 1972

Hearing Clerk
Department of Health, Education and Welfare
Page 2

which historically have been classed as asbestos. Modern scientific techniques can, we believe, demonstrate the mineralogical and physical differences between true asbestos, which is fibrous, and those other minerals. Our clients have, prior to the publication of the aforesaid proposal, begun research designed to establish the nature of a fiber and to establish that tremolite, as found in most U.S.-produced talcs, is not in fact fibrous. The results of this research should be of enormous value to the Food and Drug Administration both in evaluating the aforesaid proposal regarding talc in food and food packaging, and also in its inquiry into the uses of various talcs and talc components in cosmetics.

Our clients' research is divided into two parts. Our clients have undertaken first a microscopic study to determine the shape factors of asbestos and of the various components of talc products. An indication of the proportions of the various shapes found within the subject materials will also be ascertained. This study will include talc products representative of the entire line that may be destined for use in food and food packaging, as well as other industrial talc products. Other producers of talc have undertaken to send samples of their ores and products to our clients in order that a thoroughly representative study may be made. The results of this research will be incorporated in a written report which will include numerous photomicrographs.

The second phase of our clients' research will constitute studies by X-ray diffraction techniques. The same talc products as used in the microscopic study will be examined by X-ray diffraction for qualitative identification and quantitative determination of their various components. The quantitative part of this work involves considerable effort in the development of standards for the relevant mineralogical components.

As stated above, this research is already under way. However, it will be impossible to conclude same within the period set forth for comment in the aforesaid proposal. Accordingly, we respectfully request an extension of 120 days within which to file written comments to the aforesaid proposal. We submit that this extension will benefit all parties concerned by permitting the formulation of precise mineralogical definitions of so-called "asbestos" substances used in food and cosmetics and by identifying with particularity the exact minerals, the characteristics of which may render them possibly injurious to health.

CRMC-MAD-000930

DAVIS, GILBERT, LEVINE & SCHWARTZ

October 5, 1972

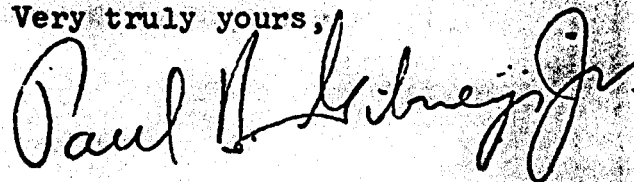
Hearing Clerk
Department of Health, Education and Welfare
Page 3

Furthermore, it is our understanding that other producers of talc are undertaking research to show that there can be no migration of talc particles, as used in food packaging, into the food itself, thereby avoiding the possibility of ingestion of those particles. We further understand that other producers intend to produce medical evidence that, contrary to the assumption of the aforesaid proposal, there is no carcinogenic effect which results from the ingestion of talc. These studies also should be of great value to the Food and Drug Administration in determining the validity of the aforesaid proposal, and we believe that no action should be taken on said proposal until those studies have been submitted and evaluated.

Lastly, we note with interest the statement in the proposal that "talc can be processed to remove asbestos-form particles". Our clients know of no commercially feasible process to remove such particles. We should appreciate a description of the process referred to in order that we may have the opportunity to comment on same.

Your prompt attention to our request for an extension of 120 days within which to comment on the aforesaid proposal will be greatly appreciated.

Very truly yours,



PBGibney, Jr./rde

CRMC-MAD-000931

October 9, 1974

Mr. H. B. Vanderbilt
President
Chief Executive Officer
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 08855

Dear Mr. Vanderbilt:

This is in reply to your letter of September 26, concerning your request for relief from the asbestos standard for your talcs containing non-fibrous tremolite, actinolite, and anthophyllite.

My letter of August 6 stated that non-fibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the asbestos standard and, therefore, the provisions of that standard do not apply to talc containing non-asbestiform minerals.

NIOSH is currently conducting a thorough investigation into the exact minerals to which talc workers were exposed in those studies where asbestosis or other adverse medical effects were found.

Pending the receipt and evaluation by OSHA of the report by NIOSH on this investigation, if you have scientific evidence that the naturally occurring talcs, prior to processing by milling or crushing, do not contain fibrous or asbestiform tremolite, anthophyllite, actinolite or other asbestiform minerals, you may certify to your customers that the talc does not contain asbestos.

Fibrous, asbestiform minerals such as fibrous tremolite means naturally occurring asbestiform minerals which prior to or after crushing and processing, contain fibers made up of fibrils.

Sincerely,

/s/ John H. Stender

John H. Stender
Assistant Secretary of Labor

CRMC-MAD-000932

*Specifications*C O P Y

October 9, 1974

Mr. H. B. Vanderbilt
President
Chief Executive Officer
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 08855

Dear Mr. Vanderbilt:

This is in reply to your letter of September 26, concerning your request for relief from the asbestos standard for your talcs containing non-fibrous tremolite, actinolite, and anthophyllite.

My letter of August 6 stated that non-fibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the asbestos standard and, therefore, the provisions of that standard do not apply to talc containing non-asbestiform minerals.

NIOSH is currently conducting a thorough investigation into the exact minerals to which talc workers were exposed in those studies where asbestosis or other adverse medical effects were found.

Pending the receipt and evaluation by OSHA of the report by NIOSH on this investigation, if you have scientific evidence that the naturally occurring talcs, prior to processing by milling or crushing, do not contain fibrous or asbestiform tremolite, antophyllite, actinolite or other asbestiform minerals, you may certify to your customers that the talc does not contain asbestos.

Fibrous, asbestiform minerals such as fibrous tremolite means naturally occurring asbestiform minerals which prior to or after crushing and processing, contain fibers made up of fibrils.

Sincerely,

/s/ John H. Stender

John H. Stender
Assistant Secretary of Labor

CRMC-MAD-000933

INDEX OF TEST METHODS

1963

1.0 Safety - General

- 1.1 Chemical & Laboratory Safety
- 1.2 Table of common hazardous chemicals
- 1.3 Limits of inflammability of gases and vapors
- 1.4 Safety - Industrial Solvents.
- 1.5 The Industrial Environment - its evaluation and Control
- 1.6 Caution Labels and I.C.C. other regulations
- 1.7 Lead Determination
- 1.10 Dust Count
- 1.11 Determination and Control of Industrial Dust
- 1.12 Smoke Scale - Ringelmann Air Pollution
- 1.13 Cleaning Dust Protectors
- 1.14 CO-Gasdon Workside Tester - Mine Safety Appliances
 - 1.14.2 Clutch Bearings Rot Spin Tester - Calibration of
Check of Tachometer
- 1.15 Davis Combustible Gas Indicator & Holden Meter
- 1.16 Dust in Gases - Collection Methods Covered by Standards
(See 2.30.4)
- 1.17 Water & Air Pollution Abatement Manuals - Mfg. Consultants, Inc.
- 1.18 Pump for Dust Sampling - Wilson Products Inc.
- 1.19 Static Electricity

CRMC-MAD-000934

07692

09 19 11

GEN. M.T.'S & ASSO. TESTS

07693

CRMC-MAD-000935

09 1912

File

METHOD OF TEST INDEX

2.0 General Materials & Associated Tests

2.1 Asbestos Fiber - General

2.1.1 Mill Method & Quebec Shaker Tests

2.1.2 Rotap Screen Tests

2.1.3 Fiber Length - General

2.1.3.1 Badollet Air Analysis

2.1.3.2 Badollet Uniflow Filtration Tests

2.1.3.3 Determination of Crudy Fiber & Rock Badollet

2.1.3.4 Asbestos Fiber-Aspiration Test on Short Fiber

2.1.3.5 McNett Test

2.1.4 Buoyancy Test

2.1.5 Analysis of High Temp. Insulation-Ignition Loss on Fiber

2.1.6 Microscopic Identification of Chrysotile

2.1.7 Blue & Amosite Fiber - Wet Screen Test

2.1.8 Asbestos Fiber - Comp. Analysis of "C" Fiber by Fusion Method vs. Boiling with Conc. HCl.

2.1.9 Fiber in 85% Magnesia Blocks

2.1.10 Iron in Chrysotile Asbestos Fiber

2.1.11 Asbestos Fiber in No. 1150 Cement

07694

CRMC-MAD-000936

METHOD OF TEST INDEX

- 2.1 Asbestos Fiber - General - continued
 - 2.1.12 Asbestos Fiber Diameter Tester
 - 2.1.13 Asbestos Fiber Moisture
- 2.2 Coal & Coke - General
 - 2.2.1 Sulphur in Coal & Coke
 - 2.2.2 Moisture in Coal
 - 2.2.3 Heat Value of Combustible Fuel
 - 2.2.4 Coal & Coke Particles
- 2.3 Gasoline - Naphtha & Petroleum Products - organic solvents
 - 2.3.1 Gasoline - Evaporation Method for Naphthas
 - 2.3.2 Aniline Point of Petroleum Solvents & Solubility of Coal Tar Resins.
 - 2.3.2.1 Aniline Points of Hydrocarbons
 - 2.3.3 Method of Gaging in Storage
 - 2.3.4 Sulfur - chlorine in Gasoline Naphtha & Kerosene

07695

CRMC-MAD-000937

METHOD OF TEST INDEX

2.4 Mineral Oils

Glossary of Petroleum Terms

Gravity

Flash & Fire

Color

Viscosity

Kinematic Viscosity

Viscosity Index SAE

SAE Numbers

Dilution of Crankcase Oils

Cloud & Pour Points

Neutralization and Saponification Nos.

Steam Emulsion Number

Precipitation Number

Ash Content

Carbon Residue

Sulphur Content

Corrosion

Oxidation Test

Distillation

Reid Vapor Pressure

Octane Number

Cetane Number

Gum in Gasoline

Thermal Value of Fuel Oils

Penetration

Dropping Point of Grease

Melting Point - Paraffin

Oil Content - Paraffin

Carbonizable Substances

Dielectric Strength

Aniline Point

METHOD OF TEST INDEX

- 2.5 Lubricants & Liquid Fuels - Misc. Pamphlets
- 2.6 Commercial Fats & Oils - Sampling & Analysis - Ind. & Eng. Chemistry
 - 2.6.1 Grease - Determination of Soap
 - 2.6.2 Detection of Fish Oils in Vegetable Oils
 - 2.6.3 Characteristics of Fatty Acids
 - 2.6.4 Linseed Oil
- 2.7 Tall Oil
- 2.8 Sulphonated Oils - Method of Test
- 2.9 Resin - Determination of Resin Acids in Resin Oils
- 2.10 Resins - Plastics ^{General} _^ V119 Resin (Barrett) M.O.T.
 - 2.10.1 Gumar - Barrett M.O.T. for Floor Tile Resins
 - 2.10.2 Vinylite - Resin Bakelite Method of Test
 - 2.10.3 Plastic Coated Fabrics and All Plastic Sheeting
 - 2.10.4 Hercules Test Methods - Vinsol Resins
 - 2.10.5 Epoxy Resins - General
 - 2.10.5.1 Ciba Company
 - 2.10.5.2 Shell Chemical Company
 - 2.10.5.3 Union Carbide - Bakelite
 - 2.10.5.4 Res Plastics Inc.
 - 2.10.5.5 General Mills
 - 2.10.5.6 Johns Dabney

METHOD OF TEST INDEX

- 2.10.6 Fluoroethylene Resins (Teflon)
- 2.10.7 Polyamide Resins (Versamid)
- 2.10.8 Polyvinyl Chloride
- 2.10.9 Cardolite Resins (formerly 8.1.12)
2.10.9.1 - 3M Co.
.2 - Colloid Chem.
- 2.10.10 Phenol-Formaldehyde Synthetic Resins (Durez, Bakelite, Polyrez, Schenectady, Varcum) (formerly 8.5 series)
 - 2.10.10.1 Screen Test - Dry Method
 - 2.10.10.2 Grit Test on Powdered Resins for Foreign Matter
 - 2.10.10.3 Hot Plate Cures
 - 2.10.10.4 Melting Point Determinations (Capillary Tube)
 - 2.10.10.5 Percentage of CL & SO in Spent Catalyst - 1911
 - 2.10.10.6 Jell Time at 250°F. on Liquid Resins
 - 2.10.10.7 Specific Gravity by Hydrometer
 - 2.10.10.8 Viscosity in Centipoises
 - 2.10.10.9 pH by Beckman pH Meter
 - 2.10.10.10 Non-Volatile Matter by Weight - ASTM Method D-115
 - 2.10.10.11 Vinyl Chloride-Acetate Resins - Bakelite Specs. & Methods
 - 2.10.10.12 Moulded Compound
 - 2.10.10.13 Molds for Resin Testing
 - 2.10.10.14
 - 2.10.10.14.1 Durez
 - 2.10.10.14.2 Bakelite
 - 2.10.10.14.3 Schenectady
 - 2.10.10.14.4 Polyrez
 - 2.10.10.14.5 Varcum

CRMC-MAD-000940

07698

METHOD OF TEST INDEX

- 2.11 Ribbers - (See File 8.3)
- 2.12 Alcohols & Polyhydric alcohols - General - organic chemicals
 - 2.12.1 Methyl, Ethyl and Isopropanol alcohol
 - 2.12.2 Glycerine on the road to Glycerol
 - 2.12.3 Sorbitol substitute for glycerine
 - 2.12.4 Freezing Point of various mixtures - Alcohol, ethylene, glycol, glycerine
 - 2.12.5 Polyhydric Alcohol Esters
 - 2.12.6 Nitrocellulose
- 2.13 Yarn and Cloths
 - 2.13.1 Cotton yarns - Single U Plied
 - 2.13.2 Cotton Fabrics
 - 2.13.3 Cotton in Asbestos Yarns (See File 3.4)
 - 2.13.4 Monograph for determining cotton in asbestos textiles
 - 2.13.5 Textiles - Test Methods - Fed. Spec. CCC-T-191b
- 2.14 Paints & Pigments & Corrosion (See File: 13.4.4)
 - 2.14.1 Sub-cut tests - Pigments
 - 2.14.2 Control tests for Pigments in Asbestos Shingles
 - 2.14.3 Wet film thickness - Gage
 - 2.14.4 Imoguer (Mervales Powder Co.)
 - 2.14.5 Bonderite
 - 2.14.6 Parkerizing
 - 2.14.7 Degreasing

METHOD OF TEST INDEX

- 2.15 Metal Powders - Metals Powder Association
- 2.16 Nails
 - 2.16.1 Plate on Nails & Bolts
- 2.17 Soaps, Detergents - Wetting Agents - cleaning
 - 2.17.1 Aerosol
 - 2.17.2 Calgon
 - 2.17.3 Tergitol
- 2.18 Water - General
 - 2.18.1 Boiler, Feed & Process Water Tests (Current)
 - 2.18.2 Boiler, Feed & Process Water Tests (Obsolete)
 - 2.18.3 W & L.D. Data Handbook & Supplements
 - 2.18.4 Boiler Water Treatment - Miscellaneous
 - 2.18.5 Boiler Plate Embrittlement, Corrosion & Cracking
 - 2.18.6 Water Pollution Abatement & Control Tests
 - 2.18.6.1 Millipore Analysis and Controls

INDEX OF NAME INDEX

2.1.9 Fortland Court - Council

2.19.1 Bag Cake Testing - General

2.19.2.1 Sag Coll: test procedure

2.19.1.2 Check on any equipment

2.15.1.3 Shown during Bag Case operations

2.12.2.4 Substrate for stone cutting up to 100

2.1.7.2 Adaptor circuit pinouts associations

2.19.3 Date of last release by current photo

2.12.4 - Setting time of Portland Cement controlling by
wet thermometer

2.2.6.3. Sharp test - correction

2-28-67 President Lyndon B. Johnson, White House, Washington, D.C.

7-10-71 SAC, San Antonio (100-100000) - 100-100000

2-10-70 Portland Canal - 12 to 14 ft. deep 12-31-70

8.10.3 Penelope Bird - Wagner Endowment

METHOD OF TEST INDEX

2.20 Gases - General

- 2.20.1 Method of Operation of Infrared Gas (Grubb) Analyser for CO_2 , C_2 , and CO
- 2.20.2 Mass Spectrometric Analysis of Hydro-carbon and Gas Mixtures
- 2.20.3 CO_2 by means of a Rastbach apparatus
- 2.20.4 Velocity, volume, flow and mass content of gases
- 2.20.5 Hydrogen and Ethylene in air streams
- 2.20.6 Compressed gases
- 2.20.7 Determination of (30) Carbon Monoxide
- 2.20.8 Mass Spectrographic Determination of H_2 , C_2 , CO

2.21 Mass - General

- 2.21.1 Gravimetric Analysis and Volumetric Analysis

2.22 Gas Evol. (G.E.)

2.23 Water, General (See also 2.20)

- 2.23.1 Gas Evol. Method (Foster) for H_2O in air
- 2.23.2 Mass & Gravimetric Method of Estimating H_2O

2.24 Carbon Dioxide in Gases and Liquids

2.25 Nitrogen

2.26 Analysis of Gaseous Hydrocarbons using O_2

2.27 Carbon Dioxide Estimating Apparatus and Other Apparatus

SCOTT WELD (See also 2.20.1)

METHOD OF TEST INDEX

2.30 Sodium Silicate

2.30.1 Sodium and Potassium Tests

2.40 Silica

2.40.1 SiO_2 in High Silica Materials

2.40.2 SiO_2 Rapid method in Cements and Slag

2.40.3 SiO_2 Free Silica in Transite Pipe

2.50 Zinc Oxide

2.60 Silicenes

2.60.1 Dev

2.70 Waxes

2.80 Chemicals - (Also see File: 2.12)

2.80.1 Acids

2.80.2 New Type of liquid Amines

2.81 Sulfamic Acid

2.90 Murex

METHOD OF TEST INDEX

- 3.0 General Analytical Methods and Reagents
 - 3.1 Fisher Electrophotometer
 - 3.2 Fisher Titrator & pH
 - 3.3 Special Analytical Reagents & Techniques
 - 3.3.1 Cerate Oxidimetry
 - 3.3.2 Periodic Acid and Iodic Acid and their Salts
 - 3.3.3 Perchloric Acid and Wet Ashing Methods
 - 3.3.4 Phenanthraline and substituted Phenanthroline Indicators
 - 3.3.5 Eastman Indicators
 - 3.3.6 8-Hydroxyquinoline
 - 3.3.7 Decomposition of Aluminous Silicate
 - 3.3.8 Platinum Ware
 - 3.3.9 Nickel, Iron and Other Ware
 - 3.3.10 Celite Analytical Filter Aid
 - 3.3.11 Testing of glass volumetric equipment
 - 3.3.12 Anhydrous Magnesium Perchlorate
 - 3.3.13 Copper Reagents: Cuproins, Neocuproins, Bathocuproins
 - 3.3.14 Karl Fisher Reagent - Determination of Water
- 3.4 National Bureau of Standards - Samples and Procedures for Analysis and Calibration. Also, Labelled Compounds
ALSO IN C. CALIBRATION.

METHOD OF TEST INDEX

3.5

General Electric Chemical Methods

- E2005-02- Ash Determinations Plastic Materials
- E2006-04- Extractions Plastic Materials
- E2012-02- Freezing Point Ethanol
- E2013-01- Percent Phenol For Acids
- E2013-01- Alcohol Bior Test Dyes
- E2025-02- Percent Formaldehyde Formal in
- E2026-03- Methanol Content Formaldehyde Solutions
- E2029-01- Percent Ortho-Cresol For Acid H₂SO₄ Test
- E2030-01- Percent Meta-Cresol For Acids
- E2032-01- Free Steric Acid Etha Steroids
- E2033-01- Total & Water Insoluble Ash Insoluble Steroids
- E2011-02- Sampling Plastic Material Engine/Labor
- E2014-02- Percent Moisture Plastic Materials
- E2024-01- Acidity or Alkalinity Plastic Materials
- E2025-01- Soil Plastic Materials
- E2026-01- Soil Moisture Plastic Materials
- E2027-01- Total Moisture Plastic Materials
- E2028-01- Gels Plastic Materials
- E2029-02- Gels
- E2031-01- Ammonia Content Ammonia Hydroxide
- E2032-01- Ammonia Content Ammonia
- E2033-01- Ammonia Content Ammonia
- E2034-01- Ammonia Content Ammonia
- E2035-01- Ammonia Content Ammonia
- E2036-01- Ammonia Content Ammonia
- E2037-01- Ammonia Content Ammonia
- E2038-01- Ammonia Content Ammonia
- E2039-01- Ammonia Content Ammonia
- E2040-01- Ammonia Content Ammonia
- E2041-01- Ammonia Content Ammonia
- E2042-01- Ammonia Content Ammonia
- E2043-01- Ammonia Content Ammonia
- E2044-01- Ammonia Content Ammonia
- E2045-01- Ammonia Content Ammonia
- E2046-01- Ammonia Content Ammonia
- E2047-01- Ammonia Content Ammonia
- E2048-01- Ammonia Content Ammonia
- E2049-01- Ammonia Content Ammonia
- E2050-01- Ammonia Content Ammonia
- E2051-01- Ammonia Content Ammonia
- E2052-01- Ammonia Content Ammonia
- E2053-01- Ammonia Content Ammonia
- E2054-01- Ammonia Content Ammonia
- E2055-01- Ammonia Content Ammonia
- E2056-01- Ammonia Content Ammonia
- E2057-01- Ammonia Content Ammonia
- E2058-01- Ammonia Content Ammonia
- E2059-01- Ammonia Content Ammonia
- E2060-01- Ammonia Content Ammonia
- E2061-01- Ammonia Content Ammonia
- E2062-01- Ammonia Content Ammonia
- E2063-01- Ammonia Content Ammonia
- E2064-01- Ammonia Content Ammonia
- E2065-01- Ammonia Content Ammonia
- E2066-01- Ammonia Content Ammonia
- E2067-01- Ammonia Content Ammonia
- E2068-01- Ammonia Content Ammonia
- E2069-01- Ammonia Content Ammonia
- E2070-01- Ammonia Content Ammonia
- E2071-01- Ammonia Content Ammonia
- E2072-01- Ammonia Content Ammonia
- E2073-01- Ammonia Content Ammonia
- E2074-01- Ammonia Content Ammonia
- E2075-01- Ammonia Content Ammonia
- E2076-01- Ammonia Content Ammonia
- E2077-01- Ammonia Content Ammonia
- E2078-01- Ammonia Content Ammonia
- E2079-01- Ammonia Content Ammonia
- E2080-01- Ammonia Content Ammonia
- E2081-01- Ammonia Content Ammonia
- E2082-01- Ammonia Content Ammonia
- E2083-01- Ammonia Content Ammonia
- E2084-01- Ammonia Content Ammonia
- E2085-01- Ammonia Content Ammonia
- E2086-01- Ammonia Content Ammonia
- E2087-01- Ammonia Content Ammonia
- E2088-01- Ammonia Content Ammonia
- E2089-01- Ammonia Content Ammonia
- E2090-01- Ammonia Content Ammonia
- E2091-01- Ammonia Content Ammonia
- E2092-01- Ammonia Content Ammonia
- E2093-01- Ammonia Content Ammonia
- E2094-01- Ammonia Content Ammonia
- E2095-01- Ammonia Content Ammonia
- E2096-01- Ammonia Content Ammonia
- E2097-01- Ammonia Content Ammonia
- E2098-01- Ammonia Content Ammonia
- E2099-01- Ammonia Content Ammonia

3.6

Solway Process Methods of Analysis

3.7

Miscellaneous Methods of Analysis

3.8

Use of Radiometric Methods

3.9

Qualitative and Spectroscopic Methods of Analysis

CRMC-MAD-000947

METHOD OF TEST INDEX

4.0

Specific Chemical Methods for various Elements & Materials

4.1 FREE SULFUR

4.2 Parr Bomb Colorimeter for Sulfur and other determinations

4.3 Na_2O K_2O Determination

4.4 Chemical Analysis of Slags - General Procedures.

Rocks
4.5 ANALYSIS OF CAST IRON *Silica*

4.6 GRAPHITE AND AMORPHOUS CARBON

4.8 MgO and CaO bearing materials

4.9 Determining of iron in Nuodrex driers.

4.10 Photo-Sensitization

4.11 Chloroanilate Reagents for chemical analysis.

4.12 Spot tests for plastics.

4.13 Determination of chloride in water and water leachings by
Mercuric Nitrate Titration

4.14 Determination of Alumina in Presence of Impurities
(Niteratory Fibre)

INDEX OF TEST ITEMS

5.0 Laboratory Aids

5.1 St'd abbreviations for Scientific & Engineering Terms

5.2 George Ellinwood's notebook.

5.3 pH - Range Chart

5.5 St'd weights and measures.

5.6 St'd density and volumetric tables

5.7 Hand Tools - Navy Training Course.

5.8

5.9 Controlling accuracy of screens for screen tests
(Note: 6.20 - particle size general.)

5.10 Slide Rule - General

5.10.1 Bender Rule for Control Limit

5.10.2 Bender Graph for Distribution

5.10.3 Portland Cement Composition

5.11 Glass Clearing Solution - Single Still

5.11.1 Sulfuric Acid and potassium dichromate clearing solution.

5.12 A single still for purifying Hexaver.

5.13 Revere's Handy Label Indicator

5.14 National No. 34. Mergins (gas, air or water)

5.15 CONVERSION TABLE KILOS TO POUNDS

5.16 FRIDEN CALCULATOR

INDEX OF TEST EQUIPMENT

6.0 Test Equipment and Associated Tests

6.1 Hardness - Comparison - General

- 6.1.1 Brinell
- 6.1.2 Vickers
- 6.1.3 Puckey Jones Plastometer - Conversion Chart B. 10.11
- 6.1.4 Henry D. Scott Co., Plastometer
- 6.1.5 Rockwell
- 6.1.6 Riehle
- 6.1.7 Durometer and Kinstomaster
- 6.1.8 Gage

6.2 Temperature, Relative Humidity, Barometers - General

- 6.2.1 Operation and Calibration of Thermometers
- 6.2.2 Operation of Thermometer
- 6.2.3 Weather Instrument
- 6.2.4 Optical Pyrometer
- 6.2.5 Therm & Humidity Potentiometer
- 6.2.6 Thermoregulator (Water Bath)
- 6.2.7 High Temp. Oven Crt. No. 5500A-B
- 6.2.8 Large Hot Plate
- 6.2.9 Electric Vacuum Oven
- 6.2.10 High Vacuum Prod. Co., Oven
- 6.2.11 Electric Thermoregulator & Relay
- 6.2.12 Lab. Standard Pyrometer
- 6.2.13 Humidity - Hy Gage
- 6.2.14 Precision Barometer

CRMC-MAD-000950

METHOD OF TEST

- 6.2.15 Vapor Transmission
- 6.2.16 Linberg Combustion Furnace
- 6.2.17 Method of Measuring thermal conductivity at Furnace temps.
- 6.2.18 Huppert Furnace
- 6.2.19 Instructions for assembling and operating Sargent (Sargent) Thermoregulator
- 6.2.20 Humidity Oven
- 6.2.21 Cenco Air Agitator for Oven
- 6.2.22 Pyro-Magnestir
- 6.2.23 Bottom Plate Trent Electric Furnace
- 6.2.24 Precision Infra-dry Cabinet
- 6.2.25 Globar Elements
- 6.2.26 Cenco Drying Ovens

METHOD OF TEST INDEX

- 6.3 Viscosity - General
 - 6.3.1 Viscosity and Viscosity Index
 - 6.3.2 Viscosity vs. Temperature charts for Petroleum Products
 - 6.3.4 Stormer Viscosimeter
 - 6.3.5 Zahn Viscosity cups
 - 6.3.5 Marsh Funnel (See 9.2.3)
 - 6.3.6 Brookfield Viscometer
 - 6.3.7 Bendix Ultra Viscosometer
 - 6.3.8 Sunshine Scientific Instrument's Gel-Time Tester
 - 6.3.9 Gardner Bubble Viscometers
- 6.4 Stiffness - Olsen (Also see 12.3.3)

METHOD OF TEST INDEX

- 6.5 Tensile Testers General - Modulus - Deflection - Compressive Strength
 - 6.5.1 Scott Tensile Tester
 - 6.5.2 Schopper Tensile Tester Machine Inc.
 - 6.5.3 Tinius Olsen Tensile Tester
 - 6.5.4 Richle Tensile Tester
 - 6.5.5 Proving Rings
 - 6.5.6 Dillon Tester
 - 6.5.7 Nesting house Brake Tester
- 6.7 Refractometer - Fisher
- 6.8 Thickness - Magne - Gage -(Also see 12.7.1, 12.1.1, 12.1.12)
- 6.9 Color - Electronic Measurement
- 6.10 Pressures, Flows, Vacuum, Regulators - General
 - 6.10.1 Pressure Regulators (N-10 Cone)
 - 6.10.2 Flow - Rator - Air
 - 6.10.3 Vacuum Compressor Pump
 - 6.10.4 ASME-API Metal Code
 - 6.10.5 Marsh Gauges
 - 6.10.6 Vacuum Regulators (manostat)

METHOD OF TEST INDEX

- 6.11 Centrifuge
- 6.12 Electronic Relay
- 6.14 X-ray - Methods
- 6.15 Volt Ohmmeter
- 6.16 Microscope - Use and Care
 - 6.16.1 Microscope Lamp
- 6.17 Laboratory Balances, Analytical, Westphal Triple Beam
 - 6.17.1 Calibration of Analytical Weights
 - 6.17.2 Scales
 - 6.17.3 ~~Mettler~~ Mettler Balance
- 6.18 Varisc
- 6.19 Carver and other Presses
- 6.20 Particle Size - General (See File 5.9 for checking across)
 - 6.20.1 Blaine
 - 6.20.2 Portable Paper Jogger for Blaine Tests on Colloid
 - 6.20.3 Tyler Rotap - Screens
 - 6.20.4 *Wagner Turbidimeter*
- 6.22 Anderson Extensometer

METHOD OF TEST INDEX

- 6.23 Water Still - Precision
- 6.24 Hansen Tacker
- 6.25 Photographic Equipment
- 6.26 Rexograph Duplicator
- 6.28 Adding Machine
 - 6.28.1 Monroe Adding Calculator Instructions
- 6.29 Electric Typewriter
- 6.30 Statigun - to check static charge
- 6.31 Polarographic Analysis & Epectrographic Analysis
- 6.32 Sander - Sears - instructions
- 6.33 ~~PARTICLE SIZE -~~
Screens and Screen Testing
- 6.34 Timers
- 6.35 Conductivity
- 6.36 Torque Wrench

METHOD OF TEST INDEX

6.37 Stroboscopes

6.38 Micrometers - Surface

6.39 mixers & mixing

6.40 Calibration of metering container (can)

6.41 Surface Finish Measurements

opened
7/12/66

6.42 Roy fan Duplication

6.43 "Buffalo" Drill Presses

6.44 Compressed Gases

6.45 Megohmmeter

6.46 ~~EDDY CURRENT TESTERS~~ DAVE HYDRAULIC PRESS

6.47 ~~RIVET SETTING MACHINES~~ ULTRASONIC DETECTION

6.48 INFRARED ANALYSIS

6.49 ATOMIC ABSORPTION

6.50 X-RAY ANALYSIS

6.51 FIRESTONE DENSIMETER

6.52 RIVET SETTING MACHINES

6.53 Beckman Aquimeter

7.0 PACKING

7.1 Compressed Asbestos Sheet Packings

- 7.1.1 Compressed Asbestos Sheet Packing AIS-3231 Oil Immersion Tests
- 7.1.2 Compressed Asbestos Sheet Packing AIS-3231 Oil Resisting
- 7.1.5 RAPID SWIFT TEST FOR SHEET PACKING
- 7.1.3 Modified 50 Sheet Packing Wright Spec. 5951
- 7.1.4 CATERPILLAR METHOD FOR IMMERSION TESTS FOR 16 874
- 7.2 Rubber Sheet Packing - Res. Report No. 11-7537
~~7.2.1 Surface Lubricant for Compressed Asbestos Sheet Packing~~
- 7.3 Braided Packings - Analysis of Asb. Packing in Ring or Coil Form.
- 7.4 SURFACE LUBRICANT (PARTING AGENT)
 - 7.4.1 CATERPILLAR ASSEMBLY RELEASE
 - 7.4.2 FLANGE TESTS; WITH BOLT STRESS CALCULATIONS

7.7 Chlorine in 76 Sheet Packing

7.8 Agerite & Neozone "D" Spec.

7.9 MEC in Service Sheet - Qualitative Test

7.10 Tools and Solvents used for testing Service Sheet and Release

7.11 No. 76 Compressed Asbestos Sheet Packing to AIS-3232.

7.12 Gap for Jarrett Corp. grade penetration.

7.13 Caterpillar Assembly Release

7.13 SPECIFICATION METHODS

13.1 ASTM

13.2 SAE

13.3 FEDERAL

13.4 DEPT OF DEFENSE 1. MIL-A-70218

PICTIO

METHOD OF TEST INDEX

8.0

FRICTION MATERIALS

8.1 Brake Linings General, Bendix Cor. Eng. Spec. BS-0846 and Ford.

8.1.1 Brake Linings - Phenol-Formaldehyde Resins & Pallet Press

8.1.1.1 Test Methods for Cashew Nut Derivative Materials

8.1.2 Brake Linings - Alloy Analysis of Brass Chips

8.1.3 Brake Linings - Copper and/or Brass Wire

8.1.4 Brake Linings - Neoprene Compounds

8.1.5 Brake Linings & Blocks - Dry Mix acetone extract & ignition loss

8.1.6 Brake Linings - wear tester - flexibility tester.

8.1.7 Inspection of Lining for Firestone Tire & Rubber Co.

8.1.8 Brake Lining 1136-B - Chrysler

8.1.9 Chart for determining rejection of milled #704

8.1.9.1 Thermal swell and blistering

8.1.10 Barret - Minot Lining Bonder - Bonding of Friction Materials

8.1.11 Plaston V-119 Resin (Barrett) M. of T. (See File: 2.10)

8.1.12 Carbolite Resins - See File 2.10.9)

CRMC-MAD-000959

07721

METHOD OF TEST INDEX

8.0 FRICTION MATERIALS

8.1 Brake Linings General - continued

8.1.13 Shear Test for Bonded Lining

8.1.14 Transmission Bands - In-Process and finished product

8.1.15 Activated Alumina

8.1.16 FORD Procedures General

8.1.16.1 FORD DTA

8.1.16.2 FORD EAST

8.1.16.3 FORD PAC

8.1.17 DENS - MORGAN

8.2 Clutch Facing General

8.1.18 Denco DRUM LINING TEST

8.1.19 Hot Compressibility D/K rubber
Lining

8.2.2 Clutch Facings - Ignition Loss

8.2.3 Hot Spin Tester and Associated Equipment

8.2.4 Weight Loss of Dry Mix Lining Slabs or heating at 300°F.

8.3 Rubber - Elastomers

8.3.1 Solvent for use on Vulcanized Rubber

8.3.2 Flexing Tests for Rubber Products

8.3.3 Rubber - Adhesion of Vulcanized Rubber to Metal

8.3.4 Accelerated Aging of Vulcanized Rubber

METHOD OF TEST INDEX

8.0 FRICTION MATERIALS

8.3 Rubber - Elastomers - continued

- 8.3.5 U. S. Government General Spec. & Method of Physical Test and Chemical Analysis
- 8.3.6 Rubber & Synthetic Rubber Compound Freeze Resistance
- 8.3.7 Specification for GR-S and FR-M Synthetic - Natural Rubber
- 8.3.8 Glossary Rubber Compounding Ingredients
- 8.3.9 Effect of Emp. of Resilience of Natural & Syn. Rubber
- 8.3.10 Method Test Reclaimed Rubber
- 8.3.11 Scott Rubber & Fabric Testing Direction
- 8.3.12 Hycar 1411 Powder
- 8.3.13 Accelerator, Auto Oxidant, etc. R. T. Vanderbilt
- 8.3.14 Crumb Rubber - Ash test for percent Talc
- 8.3.15 Cycleweld Flow - Test Procedure
- 8.3.16 Chemical Analysis of Natural Rubber
- 8.3.17 Chemical Resistance of Various Rubbers

CRMC-MAD-000961

07723

METHOD OF TEST INDEX

8.0 FRICTION MATERIALS

8.3 Rubber Elastomers - continued

8.3.18 Latex Rubber

8.3.19 Synthetic Elastomers

8.3.19.1 Viton

8.3.19.2 Nardel - Ethylene - Propylene (Dupont)

8.3.19.3 Phillips Petroleum

8.3.19.4 Texas U. S. Chemical

8.3.19.5 Goodrich Gulf

8.3.19.6 Goodyear

8.3.19.7 Neoprene

8.3.20 Plasticizers for Rubbers and Resins

METHOD OF TEST INDEX

8.0 FRICTION MATERIALS

8.4 Metallic Chips or Particles, Brass, Copper, Zinc, Cast Iron

8.5 FRICTION PARTICLES

8.5 Synthetic Resins (Durez and Schenectady Bakelite) - also,
See 2.10.10 Series

8.5.1 Screen Test - Dry Method

8.5.2 Grit Test on Powdered Resins for foreign Material.

8.5.3 Hot Plate Cures

8.5.4 Melting point determinations (Capillary Tube Method)

8.5.5 Percentage of Cl & SO in Spent Catalyst - 1011

8.5.6 Jell time at 250°F. on Liquid Resins

8.5.7 Specific Gravity by Hydrometer

8.5.8 Viscosity in Centipoises

8.5.9 pH by Beckman pH Meter

8.5.10 Non-Volatile Matter by weight - ASTM Method D-115

8.5.11 Vinyl Chloride-Acetate Resins - Bakelite Specs. & Methods

8.5.12 Moulded Compound

CRMC-MAD-000963

07725

METHOD OF TEST INDEX

8.0 FRICTION MATERIALS

8.5 Synthetic Resins - continued

8.5.13 Molds for Resin Testing

8.6 Brake Blocks

8.7 Solvent Recovery Tests and Methods

8.7.1 Activated Carbon Test Methods

8.8 Carbon Black

8.9 Sulphur

8.10 Graphite

MAJESTIA

CRMC-MAD-000965

0

METHOD OF TEST INDEX

9.0 MAGNESIA

9.1 Magnesia - General Control Tests

- 9.1.1 Control Tests on Solution at Mixing Room
- 9.1.3 Determination of Diatomaceous Earth in Mag. Insulation
- 9.1.4 Magnesia - Sand Density Tests & Standards & Wet Density
- 9.1.5 Determination of Asb. in Mag. Blocks & Covering
- 9.1.6 Magnesia in Resaturated Lime
- 9.1.7 Calcium in Magnesia Block

9.1.9 Percent Solids in Slaked Dolomite Slurry

9.1.10 Water Absorption

9.1.11 Magnesia in Magnesia Insulation

9.2 Superex - General Control Tests

- 9.2.1 Superex - Shrinkage
- 9.2.2 Magnesia in Superex
- 9.2.3 Gel value on Marsh Funnel - Bentonite Gel Value
- 9.2.4 Charts for simplifying calculation of MR on P/C
- 9.2.5 Charts for estimation of MFC in Superex
- 9.2.6 Description of Method for Making Insulation Blocks

9.3 Magnesia - Superex Pipe Covering & Blocks Method of Test

9.4 Viscosimeter tests for Bentonite (See 10.1.2)

9.6 Investigation of the Determination of Calcium and Magnesium

9.7 Tests on Sil-O-Cell and Microcell

9.8 Zonolite (Unexpanded Vermiculite)

9.10 Control Tests for presence of Midex 617 for P. Ins. Jacketing Cloth

9.11 Analysis of Variance and Acceptance Sampling Plan for Celite Blaine Surface Areas

9.12 Compressive Strength - Magnesia and Superex Blocks

0123456789

CRMC-MAD-000967

0123456789

METHOD OF TEST INDEX

10.0 CEMENTS

10.1 Refractories - General Control Tests

- 10.1.1 Refractories No. 24 Calcine Clay
- 10.1.2 Refractories, Bentonite (See 9.4)
- 10.1.3 Refractories, Analysis for High Alumina Refractories
- 10.1.4 Cross Section Constants for M.R. Calculations
- 10.1.5 Lompoc Insulating Brick

10.2 Insulating - General Control Tests

- 10.2.1 Insulating-Proposed ASTM Methods for Testing Thermal Insulating Cements.
- 10.2.2 Insulating - Expanded Vermiculite
- 10.2.3 Benzidene test for Bentonite

10.3 Plaster of Paris - General

- 10.3.1 Control Tests

10.4 Insulating Brick - General

- 10.4.1 Fireclay Brick - Bur. of Stds.

10.5 Clays - Miscellaneous Pamphlets

10.6 Wet Cements - General

- 10.6.1 Consistency - Free Fall Method of Tests (Marville)
- 10.6.2 Consistency of Insulkote

10.8 Linear Shrinkage of Modulus of Rupture - Gas Vent Cement

10.9 Sprayed Asbestos Fireproofing - Proposed Tentative Product and Inspection Standards

BOOK NO. 1

CRMC-MAD-000969

METHOD OF TEST INDEX

11.0 ROCK WOOL - REFRACTORY WOOL

11.1 Rock Wool - General

11.1.1 Control Tests

11.1.2 Determination of Thickness of Resilient Batts

11.1.3 Determination of Shot

11.1.4 Quebec/Shaker Tests

11.1.5 Stability

11.1.6 Determination of Sulphur

11.1.7 Waterproofness

11.1.8 Determination of Solubility of Mineral Wool

11.1.9 Gain in weight during loss on ignition

11.1.10 Determination of Out-of-Carton thickness of resilient batts

11.1.11 Slag & Melt Analysis

11.1.12 Determination of Fe_2O_3 in Slags & Melts

11.1.13 MUF Rib Coated Backing Paper - striking thru

11.1.14 Fiber Diameter Measurement by Klaine Fineness Tester and Microscope

11.1.15 Volumetric Determination of Aluminas in presence of H_2O_3 Impurities - Research Report 492-INT-70

METHOD OF TEST INDEX

11.0 ROCK WOOL - REFRACTORY WOOL

11.2 Rock Cork - General

11.3 Insulating Board - General

11.3.1 Insulating Board moisture control tests

11.3.2 Insulating Board - U. S. Dept. of Commerce Tests

METHOD OF TEST INDEX

12.0 PAPER MILL - MILLBOARD

12.1 Paper Testing - General - Conditioning & Weathering of Paper

12.1.1 Measuring Thickness of Paper

12.1.2 Kerosene Test

12.1.3 Saturating Efficiency of Roofing Felts

12.1.4 Gel Test Starch - Glue

12.1.5 Sponge Waste

12.1.6 Microscopic Examination

12.1.6.1 Pulp & Paper Fiber
Composition Stads. Bur. of Stds.

12.1.7 Testing Pulp

12.1.8 Bags - Slide Rule for Dry Weight

12.1.9 Bags - Grading & Moisture

12.1.10 Apparatus for determining vapor, etc.

12.1.13 T.A.P.P.I. Methods General (All in one Book)

.1 Moisture in Wood Chips and Sawdust by Toluene T-3

.2 Species Identification of Wood & Wood Fibers T-8

.3 Conditioning and weathering of Paper

.4 Sampling and Preparing Wood for Analysis T-11

.5 Dirt in Wood Chips T-14

.6 Sampling Paper for Testing T-400

.7 Fiber Composition of Paper T-401

.8 Conditioning Paper and Paperboard for Testing T-402.

.9 Bursting Strength of Paper T-403

.10 Tensile breaking strength of paper and paperboard T-404

.11 Paraffin in Paper T-405

.12 Thickness and Density of Paper T-411

.13 Moisture in Paper and Paperboard T-412

.14 Ash in Paper T-413

.15 Internal Tearing Resistance of Paper T-414

.16 Starch in Paper T-419

.17 Qualitative Analysis of Mineral Filler and Mineral Coating of Paper T-421.

.18 Saturating Properties of Roofing Felt T-427

.19 Alpha Beta & Gamma Cellulose in Paper T-429

.21 Wet Tensile Breaking Strength of Paper and Paperboard

.22 Surface Wettability of Paper T-458

.23 Wax Test for Surface Strength of Paper - T-499

.24 Flammability of Treated Paper and Paperboard T-451

.25 Water Vapor Permeability of sheet materials at high temperature and humidity T-464

.26 Analysis of Formaldehyde T-600

.27 Analysis of Resin Size T-628

.28 Melting Point of Paraffin Wax T-630

.29 Standard Drainage time of pulp for Insulating Board T-1002951

- 12.1.14 Rag Felts - General
- 12.1.15 Asbestos Papers - General
- 12.1.16 Mullen Tester
- 12.1.17 Bonding of Hoist Brake Lining (No. 1 Paper Machine)
- 12.1.18 Determination of Chloride in Water and Water Leakings in Paper
- 12.2 Laboratory Apparatus for Making Paper
- 12.3 Miscellaneous Equipment for Testing Paper
 - 12.3.1 Tear Tester
 - 12.3.2 Gurley Densometers
 - 12.3.3 Stiffness Testers - General
 - 12.3.3.1 Minus Olsen Stiffness Testers
 - 12.3.3.2 Gurley Stiffness Tester
 - 12.3.3.3 Stiffness Tester - Clark
 - 12.3.4 William Freeman Tester
 - 12.3.5 Equipment Testing Paper (Fenimore's)
 - 12.3.6 Determination of Bennett Size and Starch
 - 12.3.7 Slimicide Residual Test (Malco & Dowicide)
- 12.4
 - 12.4.2 Bennett Size
- 12.5 Robertson Felts
 - 12.5.2 Permit Fork-Discharge to Sanitary Sewers
- 12.6 Savall System
- 12.7 Millboard General
 - 12.7.1 Millboard Thickness
 - 12.7.2 Millboard Deflection
 - 12.7.3 Millboard - "Friton D" Reagent
 - 12.7.4 Millboard Glass Marks
 - 12.7.5 Millboard - Alkalinity Tests
 - 12.7.6 Millboard Starch Tests - American Thomas Products Co.
- 12.8 Labels on Cartons

METHOD OF TEST INDEX

13.0 PIPE COVERING - SEIGELITE - SANACOUSTIC

13.1 Pipe Covering - General

13.1.1 Preshrunk Asbestocal & Preshrunk Indented Wool Felt

13.1.2 Shrinkage Tests

13.1.3 Conductivity Apparatus

13.1.3.1 White Glazed Wrappers - P/C

13.1.3.2 White Glazed P/C Underwriters' fire test

13.1.4 Gravity of Seigelite Saturants

13.2 Seigelite General

13.2.1 Seigelite (Plant Fiber Sheet Packing)

13.2.1.2 Navy Leakage Tests

13.3 Glue for Seigelite

13.4 Control Tests on Sanacoustic Coating

13.4.1 Salt spray test for corrosion of painted surfaces

13.4.2 Tin Plate

13.4.3 Test solutions for Parker Rust Proofing Test Unit (Sanacoustic)

13.4.4 Paint Testing (See file 2.14)

13.4.5 Holding Power in T Bars (Sanacoustic Pens Type L&S)

METHOD OF TEST INDEX

14.0 ROOFING

14.1 General - Analysis & Testing

- 14.1.1 Texas Roofing Co.
- 14.1.2 The Ruberoid Company
- 14.1.3 Flintkote - Granule Test
 - 14.1.3.1 Flintkote Co. Cone Penetration Test
- 14.1.4 U. S. Gypsum Co.
- 14.1.5 Bird & Son
- 14.1.6 Phillip Carey
- 14.1.7 Certain-Teed Co.
- 14.1.8 Asphalt Roofing Industry Bureau
- 14.1.9 Underwriters' Laboratories

14.2 Slates - General

- 14.2.2 Slates - Adhesion of Roofing Granules
- 14.2.3 Roofing Granule Efflorescence
- 14.2.4 Roofing Granule Asphalt Stain
- 14.2.5 Roofing Granule - Asphalt adhesion J.M. Method
- 14.2.6 Roofing Granule Acid Resistance
- 14.2.7 Roofing Granule Blistering
- 14.2.8 Roofing Granule Sulfide Discoloration
- 14.2.9 Roofing Granules Screen Grading
- 14.2.10 Roofing Granule Surface Alkalinity
- 14.2.11 Roofing Granule Surface Deformation
- 14.2.12 Roofing Granule Pigment Fixation
- 14.2.13 Roofing Granule Hardness
- 14.2.14 Roofing Granule Steam Leach Test
- 14.2.15 Roofing Porosity of Granules

METHOD OF TEST INDEX

14.0 ROOFING - continued

14.3 Tests on Bituminous Materials

- 14.3.1 Softening Point of Bit. Material Ring and Ball Method
- 14.3.2 Asphalt Products - Solubility in Carbon Tetrachloride of CS_2
- 14.3.3 Asphalt Products - Loss on Heating
- 14.3.4 Asphalt Products - Specific Gravity
- 14.3.5 Particle Size of Asphalt Emulsion (Insulkote)
- 14.3.6 Photo-sensitivity of Asphalt coating - Res. Test 11738
- 14.3.7 Filler in Coating Asphalts for Roofing
- 14.3.8 Livering Test
- 14.3.9 Viscosity Chart
- 14.3.10 Film Preparations and Bird Applicator
- 14.3.11 Masticoko
- 14.3.12 Chromatographic separation of asphalt components
- 14.3.13 Barrett Slide Tests (Underwriters' Procedure R-99)

14.4 Flash Point - Various Methods

14.5 Penetration

- 14.5.1 Penetration - Stove Putty Needle
- 14.5.2 Precision Universal Penetrometer
- 14.5.3 Precision Junior Penetrometer

14.6 Foam Test

14.7 Stain

- 14.7.1 Compatibility Test

14.8 Weight per gallon

- 14.8.1 Weight per gallon and Specific Gravity

14.9 Consistency

- 14.9.1 Consistency of Silento Saturant

CRMC-MAD-000976

07741

METHOD OF TEST INDEX

14.0 ROOFING - continued

- 14.10 Tensile Strength and Laminar Strength
- 14.11 Mullen Strength
- 14.12 Flexibility at 77 degrees F.
 - 14.12.1 Flexibility at 30 degrees F.
- 14.13 Kerosene Test
- 14.14 Saturation Efficiency
- 14.15 Extraction of Roofings - Marrero
 - 14.15.1 Extraction of Roofing - Pittsburgh
 - 14.15.3 Percent Desaturation - Tar Saturated Felts
 - 14.15.4 N.A.C.E. Asbestos Pipe Line Felts Inorganic Content
- 14.16 15 lbs. Asbestos Pipe Line Felts
 - 14.16.1 Hot Tensile Strength
- 14.17 Perforated Felt
- 14.18 Silento Felts
- 14.19 Insulkote
- 14.20 Approximate Analysis of Aggregate from Masticoke
- 14.21 Dash Liners - Insulation Tests
- 14.22 Oliensis Heterogeneity of Asphalt
- 14.23 Investigation of Black Line Products for Red Label and Flash
- 14.24 Accelerated Weathering Tests
- 14.25 Laboratory Asphalt Still ~~Blowing Procedures~~
 - ~~14.25.1 Standard Oil Blowing Procedures~~
- 14.26 Slam Tests
- 14.27 Still Room Products Specifications
- 14.28 Paint Shop Product Specifications
- 14.29 Exposure Decks

METHOD OF TEST INDEX

14.0 ROOFING - continued

- 14.30 White Top - Firetard Rfg. Effectiveness of Waterproofing
- 14.31 Analysis of Industrial Flooring Mastics
- 14.32 Asphalt Roofing or Waterproofing Felts - Loss on Heating
- 14.33 Volume Calibration of Roofing Plant Still
- 14.34 Back Coating Thickness
- 14.35 Water Absorption
- 14.37 Foamite Solution Tests
- 14.38 Asphalt in Tar
- 14.39 Insulation Board Brick Siding
- 14.40 Roofing - Repairs and Utilities - War Dept. Manual TM-5-617
- 14.41 Merrill Oil - Percent Solids
- 14.42 Insulated Brick Siding
 - Slump Test
 - Coating Weight
 - Shrinkage
 - Blistering Test
- 14.43 Dye Test for Felt Saturation
- 14.45 Proposed Method of Test - Coal Tar Saturant
- 14.46 Seal-O-Matic Splitting and Sealing Demonstration
- 14.47 Grays Ferry Accelerated Clawing Test (Barrott)
- 14.48 Tar Saturated Felts
- 14.49.1 DESATURATION OF TAR FOR FELTS



CRMC-MAD-000979

07744

METHOD OF TEST INDEX

15.0 FLOOR TILE (See 2.10.1 for Resin Test Methods)

15.1 Asphalt Tile - General Asphalt Tile Institute

15.1.1 Heavy Duty Tile

15.2 Inspection and Testing

15.3 Brittleness

15.4 Color Comparison of Base Compounds

15.5 Olsen Special Tile Testing Machine

15.6 Riehle Hardness Tester

15.7 Floor Tile - Miscellaneous

15.11 Methods and Specs. for Soap used on Floor Tile

15.12 Floor Tile Binder Content

15.13 Care and operation of McBurney Identification Tester

15.14 Specification for Asphalt Tile Adhesive

15.15 Methods of Test - Vinyl Resin

15.16 Solids in Tile Wax

METHOD OF TEST INDEX

16.0 SHINGLES

16.1 Asbestos Siding Shingles - General

16.1.1 Control Tests on 105 Siding Shingles - Wet and Dry Process

16.1.2 Ground Scrap for Rigid Shingles

16.1.3 Impact Apparatus

16.1.4 Acid Dipping

16.1.5 Density by Mercury Displacement

16.1.6 Chemical Analysis

16.1.7 Washing No. 607 Shingles

16.1.8 Method of Test

16.1.9 Dye for Stamping Asbestos Shingles

16.1.10 Silicone Tests

16.2.1 Sag Test Procedure

16.3 FLEXBOARD AND WALLBOARD GENERAL

METHOD OF TEST INDEX

17.0 TRANSITE WOOD AND FLEXBOARD

17.1 Asbestos Vainscoting

17.2 Flat Transite - General

17.2.1 Encased Transite

17.2.2 Transite Core Plates

17.2.3 Perforated Transite Panels and Acoustical Tile

17.2.4 Ebony, Olmstone and Cheurstone

17.2.5 Modulus of Rupture Corrugated Transite and Density

17.3 Corrugated Transite - Freezing and Thawing Resistance

17.4 Ground Flexboard Scrap

METHOD OF TEST INDEX

18.0 TRANSITE PIPE

- 18.1 Transite Pressure Pipe and Couplings - General
- 18.2 Transite Conduit - General
 - 18.2.1 Conduit Couplings - Plastic
- 18.3 Rubber Rings - General
 - 18.3.1 Hardness of Rubber
- 18.5 Protective Coatings on Corrugated Transite Bolts and Fasteners
- 18.6 Asbestos Lumber (Transite) General Electric Co.
- 18.7 Alkalinity in Asbestos Cement Pipe
 - 18.7.1 Sulfuric Acid Extraction Test
 - 18.7.2 Free Lime Test for Transite Pipe
- 18.8 Rapid Method to determine percent solids in Vat
 - 18.8.1 Determination of moisture in Asbestos Cement Products using Alcohol as Absorbent
- 18.9 Transite Air Duct Corrosion Resistance, non-disintegrating and fire resistance.
- 18.10 Ring - Tite Lubricant
- 18.11 Hardness of Raw Transite Pipe Plant Sands by grinding comparison
- 18.12 Gas Vent Soil Resistance Test
- 18.13 Calgon Content - Mold Shower Water
- 18.14 Plant 325 Mesh Screen Analysis for Silica Flour
- 18.15 Crushing Strength - Three Edge Bearing Method

Factory
July 29, 1936

**TINCTURE OF MERCURIC CHLORIDE
FOR CLEANING DUST PROTECTORS
FOR FIRST AID**

Mercuric Chloride Corrosive	11.00 gm.
Chrysoidin Y	2.00 gm.
Hydrochloric Acid	7.50 cc.
Acetone	100.00 cc.
Alcohol	525.00 cc.

Distilled H₂O to make 1000.00 c.c.

CRMC-MAD-000984

07753

October 9, 1974

Mr. H. B. Vanderbilt
President
Chief Executive Officer
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, Connecticut 08855

Dear Mr. Vanderbilt:

This is in reply to your letter of September 26, concerning your request for relief from the asbestos standard for your talcs containing non-fibrous tremolite, actinolite, and anthophyllite.

My letter of August 6 stated that non-fibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the asbestos standard and, therefore, the provisions of that standard do not apply to talc containing non-asbestiform minerals.

NIOSH is currently conducting a thorough investigation into the exact minerals to which talc workers were exposed in those studies where asbestosis or other adverse medical effects were found.

Pending the receipt and evaluation by OSHA of the report by NIOSH on this investigation, if you have scientific evidence that the naturally occurring talcs, prior to processing by milling or crushing, do not contain fibrous or asbestiform tremolite, anthophyllite, actinolite or other asbestiform minerals, you may certify to your customers that the talc does not contain asbestos.

Fibrous, asbestiform minerals such as fibrous tremolite means naturally occurring asbestiform minerals which prior to or after crushing and processing, contain fibers made up of fibrils.

Sincerely,

/s/ John H. Stender

John H. Stender
Assistant Secretary of Labor

CRMC-MAD-000985

SUT0020

1544