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FIELD INVESTIGATIONS OF UNCONTROLLED HAZARDOUS WASTE SITES

FIT PROJECT

TASK REPORT TO THE ENVIRONMENTAL PROTECTION AGENCY CONTRACT NO. 68-01-6056

AIRBORNE ASBESTOS SURVEY - JOHNS MANVILLE

WAUKEGAN, IL

4/28/82

TDD#F5-8203-2-03

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ecology and environment, inc.

International Specialists in the Environmental Sciences

Airborne Asbestos Survey - Johns Manville, Waukegan, IL

4/28/82

TDD#F5-8203-2-03

Introduction

On April 28, 1982 an airborne asbestos survey was conducted at Johns Manville Company waste site located in Waukegan, Illinois. The purpose of this survey was to develop data to be used in hazard ranking of this site. With this goal in mind, a limited air sampling plan for airborne asbestos was prepared. The comparison of upwind asbestos concentrations to downwind concentrations was used as an indicator of asbestos fibers leaving this site. No attempt was made for compliance style (1) sampling, nor will comparisons be made between sample results with any legal standards.

Sampling Technique

Airborne asbestos samples were collected at upwind, midsite and downwind locations. Collections was on mixed cellulose ester membrane filters (type AA with 0.8µm(2) pore size) and were drawn by Sierra/Andersen Virtual Impactors. These series #240 dichotomous samplers (Virtual Impactor) were calibrated before use with a GCA wet test meter. This type of sampler separates collected particles by their aerodynamic size, or "cuts the sample". Particles, or fibers with an aerodynamic size of 2.5µm to 15µm are collected on the coarse filter. Those with aerodynamic size less then 2.5µm are collected on the fine filter. Particles with aerodynamic sizes greater than 15µm are rejected and are not collected. Sample collection rate was at 1.67lpm(3) for coarse collection and 15.03lpm for fine. Power for the sampling equipment was provided by three separate 3KW(4) gasoline powered generators.

[1]Generally considered long duration sampling. In addition at this time no standard environmental airborne asbestos sampling technique has been published.

[2]µm = micrometers or microns

[3]lpm = Liters per minute

[4]KW = Kilowatt

Survey Data

Meteorological conditions for the day of this survey were as follows:

Sky - Clear

Winds - 10 to 15mph from northwest

Temperature - 45°

Rainfall - None within preceding 24 hours

Sample stations were located in upwind, midsite, and downwind areas (see attached map). At the upwind, and midsite locations, the dichotomous sampling tripods were placed on the ground, giving an intake elevation of approximately 5 feet. The downwind sampling tripod was placed on top of the FIT van, giving an intake elevation of approximately 14 feet.

Average sample time was 7.5 hours, starting at approximately 10:00 a.m. and stopping at 5:30 p.m. Following sampling, filter cassettes were removed at the Johns Manville Laboratory, and carefully cut in half. This was done in order to split the sample with Johns Manville.

Analytical Technique

Analysis of samples were conducted by EMS Laboratories, Inc. Analytical Technique involved ashing of the half filters, and redistribution onto 0.1 μm nucleopore filters, using a modified Jaffe Wick Method. Grid square counting was completed using transmission electron microscopy with a X20000magnification.

Upwind Sample-Coarse #A1613

(Corrected for half filters)

Chrysotile Concentration:

Calculated Mass 38ng/m^3

Calculated fibers 0.7 fibers/cc

Chrysotile fibers (All sizes): 73

Detection Limits: 15 fibers/mm^2

Amount of Air Filtered: 0.685 cubic meters

Fields Examined: 20

Total Filter Area: 960mm^2

Size Distribution

(Chrysotile only)

Particle Length-µm	0-0.49	0.50-0.99	1.00-1.49	1.50-1.99	2.00-2.49	2.5 up
Number of Particles	4	34	14	4	6	9
Particle Width-µm	0-0.04	0.05-0.09	0.10-0.14	0.15-0.19	0.20-0.24	0.25 up
Number of Particles	0	55	12	2	1	1
Aspect Ratio-L/W	0-9.9	10-19.9	20-29.9	30-39.9	40-49.9	50 up
Number of Particles	15	34	10	3	5	4

µm micrometres
10^{-6} meters

Upwind Sample-Fine #A1614

(Corrected for half filters)

Chrysotile Concentration:

Calculated Mass 0.9 ng/m^3

Calculated fibers 2 x 10^{-2} fibers/cc

Chrysotile fibers (All sizes): 17

Detection Limits: 15 fibers/mm^2

Amount of Air Filtered: 6.15 cubic meters

Fields Examined: 20

Total Filter Area: 960mm^2

Size Distribution

(Chrysotile only)

Particle Length-μm	0-0.49	0.50-0.99	1.00-1.49	1.50-1.99	2.00-2.49	2.5 up
Number of Particles	1	5	6	1	4	0
Particle Width-μm	0-0.04	0.05-0.09	0.10-0.14	0.15-0.19	0.20-0.24	0.25 up
Number of Particles	0	13	4	0	0	0
Aspect Ratio-L/W	0-9.9	10-19.9	20-29.9	30-39.9	40-49.9	50 up
Number of Particles	3	7	5	0	2	0

Midsite Sample-Coarse #1615
(Corrected for half filters)

Chrysotile Concentration:

Calculated Mass 450 ng/^{3}

Calculated fibers 12 fibers/cc

Chrysotile fibers (All sizes): 144

Detection Limits: 150 fibers/mm^2

Amount of Air Filtered: 0.752 cubic meters

Fields Examined: 2

Total Filter Area: 960mm^2

Size Distribution
(Chrysotile only)

Particle Length-μm	0-0.49	0.50-0.99	1.00-1.49	1.50-1.99	2.00-2.49	2.5 up
Number of Particles	10	55	42	14	11	12
Particle Width-μm	0-0.04	0.05-0.09	0.10-0.14	0.15-0.19	0.20-0.24	0.25 up
Number of Particles	0	110	29	1	4	0
Aspect Ratio-L/W	0-9.9	10-19.9	20-29.9	30-39.9	40-49.9	50 up
Number of Particles	29	62	30	7	9	7

Midsite Sample-Fine #A1616
(Corrected for half filters)

Chrysotile Concentration:

Calculated Mass 270 ng/m^3

Calculated fibers 0.2 fibers/cc

Chrysotile fibers (All sizes): 118

Detection Limits: 21 fibers/mm^2

Amount of Air Filtered: 6.75 cubic meters

Fields Examined: 14

Total Filter Area: 960mm^2

Size Distribution
(Chrysotile only)

Particle Length-μm	0-0.49	0.50-0.99	1.00-1.49	1.50-1.99	2.00-2.49	2.5 up
Number of Particles	6	38	32	13	11	18
Particle Width-μm	0-0.04	0.05-0.09	0.10-0.14	0.15-0.19	0.20-0.24	0.25 up
Number of Particles	0	77	33	5	0	3
Aspect Ratio-L/W	0-9.9	10-19.9	20-29.9	30-39.9	40-49.9	50 up
Number of Particles	26	48	25	8	1	10

Downwind Sample-Coarse #A1617

(Corrected for half filters)

Chrysotile Concentration:

Calculated Mass 1.9×10^3 ng/m^3

Calculated fibers 21 fibers/cc

Chrysotile fibers (All sizes): 250

Detection Limits: 150 fibers/mm^2

Amount of Air Filtered: 0.752 cubic meters

Fields Examined: 2

Total Filter Area: 960mm^2

Size Distribution

(Chrysotile only)

Particle Length-μm	0-0.49	0.50-0.99	1.00-1.49	1.50-1.99	2.00-2.49	2.5 up
Number of Particles	23	115	64	10	15	23
Particle Width-μm	0-0.04	0.05-0.09	0.10-0.14	0.15-0.19	0.20-0.24	0.25 up
Number of Particles	0	196	42	7	3	2
Aspect Ratio-L/W	0-9.9	10-19.9	20-29.9	30-39.9	40-49.9	50 up
Number of Particles	61	104	51	12	14	8

Downwind Sample-Fine #A1618

(Corrected for half filters)

Chrysotile Concentration:

Calculated Mass below detection limits

Calculated fibers below detection limits

Chrysotile fibers (All sizes): 0

Detection Limits: 6.8 fibers/mm^2

Amount of Air Filtered: 6.8 cubic meters

Fields Examined: 20

Total Filter Area: 960mm^2

Size Distribution

(Chrysotile only)

Particle Length-µm	0-0.49	0.50-0.99	1.00-1.49	1.50-1.99	2.00-2.49	2.5 up
Number of Particles	0	0	0	0	0	0

Particle Width-µm	0-0.04	0.05-0.09	0.10-0.14	0.15-0.19	0.20-0.24	0.25 up
Number of Particles	0	0	0	0	0	0

Aspect Ratio-L/W	0-9.9	10-19.9	20-29.9	30-39.9	40-49.9	50 up
Number of Particles	0	0	0	0	0	0

Blank #A1619

(Corrected for half filters)

Chrysotile Concentration:

Calculated Mass NA

Calculated fibers NA

Chrysotile fibers (All sizes): 1

Detection Limits: 15 fibers/mm^2

Amount of Air Filtered: 0 (blank)

Fields Examined: 20

Total Filter Area: 960mm^2

Size Distribution

(Chrysotile only)

Particle Length-µm	0-0.49	0.50-0.99	1.00-1.49	1.50-1.99	2.00-2.49	2.5 up
Number of Particles	0	0	0	0	1	0

Particle Width-µm	0-0.04	0.05-0.09	0.10-0.14	0.15-0.19	0.20-0.24	0.25 up
Number of Particles	0	1	0	0	0	0

Aspect Ratio-L/W	0-9.9	10-19.9	20-29.9	30-39.9	40-49.9	50 up
Number of Particles	0	0	0	0	1	0

Discussion

Two major analytical techniques are presently used in the determination of airborne asbestos collected on sampling filters. Transmission electron microscopy was chosen for this work because it comes closest to obtaining an absolute fiber count, and it's great ability to identify fibers types. These enhanced characteristics over the alternate technique of phase contrast microscopy (optical microscope) is in great part due to it's very high resolution. With electron microscope use, every fiber observed is counted and its length and width measured. With phase contrast microscopy particles are observed for shape and size. Any particle having a length to width (or aspect) ratio greater than 3:1, and a length of 5 micrometers or greater, is counted as a fiber. This technique is not specific for asbestos fiber only. Results are presented as the number of fibers per cubic centimeter of air (f/cm^3). In addition the 5 um lower cut-off for fiber length precludes identification of a much larger population of fibers which may be present and which are of biologic significance.

The conversion of data obtained by one method to units of the other is not generally considered appropriate in the case of airborne asbestos measurement. The optical technique counts not only asbestos but all fibers, while electron microscopy is mineral specific. Fiber size range visible by electron microscopy is essentially complete, while that seen optically is truncated both physically and by regulation.

Currently established occupational exposure levels are of minimal comparitive value for this work and analytical technique. These occupational exposure levels are all based in the use of phase contrast microscopy. In addition they are not intended for the general public.

Conclusions

Sample results would indicate that a measurable airborne concentration of chrysotile asbestos fibers is leaving this site. A high concentration of 21 fibers/cubic centimeter was noted in the downwind sample as determined with transmission electron microscopy. Minor amounts of asbestos where noted in the upwind samples. This might be explained by previous deposition by wind in these now upwind areas. These deposits would then be continually reentrained and redeposited.

For the above reason this site would appear to meet the requirement for a positive air emission in the hazard ranking model.

DW:vh

312

JUN 1 6 1982

ERS LABORATORIES INC
Contract Lab

A 1616
Sample Number

AMBIENT AIR
Industrial Category

MIDSITE (FINE)
Sample Point Description

5-27-82
Date Analyzed

4289
Blank Number

4196
Standard Number

ANALYSIS INFORMATION:

Detection Limit: 21 Fibers per mm^2

Ashed sample X yes ___ no

Amount of Air Filtered: 6.75 cubic meters

Fields Examined 14

Total Filter Area 960 mm^2

Chrysotile Fibers (all sizes): 119

Chrysotile Concentration:

Calculated Mass 270 ng/m^3

Calculated Fibers 0.2 $fibers/cc^3$

SCC USE ONLY

DATA INTERPRETATION

___ Shows positive indication of chrysotile asbestos in the ambient air.

___ Shows no indication of chrysotile asbestos in the ambient air.

___ Cannot be interpreted because of the limited number of chrysotile fibers counted.

JUN 16 1982

Enviro Guidelines Division

ASBESTOS DATA REPORT

EPA Sample No: A1616
Industrial Category: AMBIENT AIR
Page 1 of 6

SAMPLE DATA

Laboratory: EMS LABORATORIES INC.
Lab ID Number: 4284
Date analyzed: 5-27-82
Analyst: B. TURNER
Filter Type: 0.1 μ nuclepore
Preparation technique: modified Jaffe Wick
Method of counting: grid square
Volume of field sample filtered: 6.75 m³

OPERATING CONDITIONS

Mode: TEM
Beam current μA: 35
Sample tilt (°): 0°
Actual screen magnification: ≈ 20,000
Av. grid area (mm²): 0.0075
No. of grid squares counted: 14
Address for grid storage: 95-2-GHI

GRID NUMBER I, II, III, IV (circle one)

SQUARE NUMBER	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION: (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE: (mm) DIAMETER	(mm) LENGTH	ASPEC
1	1	✓	✓					1	10	10
	2	✓	✓					1	12	12
	3	✓	✓					1.3	40	1[illegible]
	4	✓	✓					2	12	6
	5	✓	✓					1.5	11	7
	6	✓	✓					1.5	20	13
	7	✓	✓					40	225	5.
	8	✓	✓					1.5	15	1[illegible]
	9					✓		1.5	18	1[illegible]
	10	✓	✓					2.5	12	4
	11	✓	✓					1.5	150	10
	12	✓	✓					1	22	2[illegible]
	13	✓	✓					1.5	45	3
	14	✓	✓					1.5	25	1[illegible]
	15	✓	✓					1	37	3
	16	✓	✓					1.5	10	1
	17	✓	✓					2	8	[illegible]
	18	✓	✓					2	9	4
	19	✓	✓					2	18	[illegible]
	20	✓	✓					1	20	[illegible]
	21	✓	✓					1	14	[illegible]
	22	✓	✓					2	13	[illegible]
	23			✓				2	12	[illegible]
	24	✓	✓					2	8	[illegible]
	25							2	12	6
TOTALS		22	22	1		1				

ADDITIONAL PAGES FOR COMMENTS, IF NECESSARY

Industrial Category: AMBIENT AIR
Page 2 of 6

GRID NUMBER: I, II, III, IV (circle one)

RE ER	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE (mm) DIAMETER	(mm) LENGTH	ASPECT
2MT	1	✓	✓					3	63	4
	2					✓		1.5	8	5
	3	✓	✓					1	14	14
	4	✓	✓					1	27	2
	5	✓	✓					1	8	8
	6	✓	✓					1.5	30	2
	7	✓	✓					1	17	1
	8	✓	✓					1	22	2
	9			✓				2.5	40	1
	10	✓	✓					1	15	1
	11			✓				2	10	5
	12	✓	✓					1	20	2
	13	✓	✓					1	17	1
D	14	✓	✓					1.5	23	1
	15	✓	✓					1	26	2
	16	✓	✓					1	14	1
	17					✓		1	16	1
	18	✓	✓					1.5	14	
	19	✓	✓					1	22	
	20					✓		1	26	
	21	✓	✓					1.5	22	1
	22	✓	✓					1.5	8	
	23	✓	✓					1.5	12	
	24			✓				4	160	
D	25	✓	✓					2	20	1
OTALS		19	19	3	0	3				
ULATIVE TOTALS		41	41	4	1	4				

MMENTS:

Industrial Category: AMBIENT AIR
Page 3 of 6

GRID NUMBER: I, II, III, IV (circle one)

JARE MBER	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION: (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE: (mm) DIAMETER	(mm) LENGTH	ASPEC
Cont	1			✓				2	80	4
	2			✓				1	18	1
	3			✓				1	20	2
	4	✓	✓					.5	65	1
	5	✓	✓					1.5	55	
	6	✓	✓					2	44	2
	7	✓	✓					1	16	1
	8				✓			2	22	1
	9				✓			1	14	1
	10	✓	✓					1	27	[illegible]
	11	✓	✓					2.5	54	1
	12	✓	✓					1	10	1
	13	✓	✓					1	14	[illegible]
	14	✓	✓					1.5	38	2
	15	✓	✓					1.5	170	11
	16	✓	✓					1	32	[illegible]
	17	✓	✓					1	95	[illegible]
	18	✓	✓					1	10	1
	19	✓	✓					1	45	[illegible]
	20	✓	✓					2	18	
	21	✓	✓					2	25	1
	22	✓	✓					2	45	[illegible]
	23	✓	✓					1.5	30	[illegible]
	24									
	25									
TOTALS		18	18	3	2	0				
CUMULATIVE TOTALS		59	59	7	3	1				

COMMENTS:

HUGE BUNDLE FOUND IN GRID SQUARE #5 OF GRID #1.

(cont d)

EPA Sample No. [illegible]
Industrial Category: AMBIENT AIR
Page 4 of 6

GRID NUMBER: I, II, III, IV (circle one)

QUARE UMBER	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION: (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE: (mm) DIAMETER	(mm) LENGTH	ASPEC
1	1			✓				3	24	8
	2			✓				2	14	7
	3			✓				3	16	5.
	4				✓			1	19	1
	5	✓	✓					1.5	33	2
	6	✓	✓					1.5	24	1
	7	✓	✓					2	15	7
	8	✓	✓					2.5	22	8
	9	✓	✓					2	34	
	10	✓	✓					1.5	23	1
	11	✓	✓					1	142	1
	12	✓	✓					1	12	
	13	✓	✓					1	17	1
2	14				✓			1.5	19	1
	15	✓	✓					1.5	12	2
	16	✓	✓					1	10	
	17	✓	✓					2	18	
	18	✓	✓					1	8	
3	19	✓	✓					1	35	
	20	✓	✓					2	102	
	21	✓	✓					1.5	386	2
	22	✓	✓					1.5	26	1
	23	✓	✓					1	56	
	24	✓	✓					2	40	
	25	✓	✓					1.5	42	
TOTALS		20	20	3	2	0				
CUMULATIVE TOTALS		79	79	10	5	4				

COMMENTS:

ASBESTOS DATA REPORT
(cont'd)

EPA Sample No: 111616
Industrial Category: AMBIENT AIR
Page 5 of 6

GRID NUMBER: I, (II), III, IV (circle one)

QUARE UMBER	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE (mm) DIAMETER	(mm) LENGTH	ASPEC
3 (CONT	1	✓	✓					1	17	1
4)	2					✓		1.5	7	4
	3	✓	✓					1.5	10	6
	4	✓	✓					1	11	
	5	✓	✓					2	19	9
	6	✓	✓					1.5	90	6
5)	7	✓	✓					2	24	
	8					✓		1	9	
	9	✓	✓					1.5	56	3
	10	✓	✓					.3	30	
	11	✓	✓					1	58	
(6)	12	✓	✓					1	23	
	13	✓	✓					.2	20	
	14	✓	✓					1.5	11	
	15	✓	✓					1	28	
	16	✓	✓					.5	23	
(7)	17	✓	✓					.2	36	
	18	✓	✓					.3	32	
	19	✓	✓					1.5	40	
	20	✓	✓					.2	32	
	21			✓				1.5	19	
	22					✓		1	10	
	23	✓	✓					1.5	55	
	24	✓	✓					1	22	
	25	✓	✓					.2	21	
TOTALS		21	21	1	0	3				
CUMULATIVE TOTALS		100	100	11	5	7				

COMMENTS:

(cont'd)

EPA Sample No: 111610
Industrial Category: AMBIENT AIR
Page 6 of 6

GRID NUMBER: I, (II), III, IV (circle one)

ARE BER	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION: (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE: (mm) DIAMETER	(mm) LENGTH	ASPEC
ONE	1	✓	✓					1	26	2
	2	✓	✓					3	54	18
	3	✓	✓					1.5	55	36
	4	✓	✓					2	40	20
	5	✓	✓					2	24	1
	6	✓	✓					2	15	7
	7	✓	✓					1.5	24	16
	8			✓				2	10	5
	9	✓	✓					2.5	12	4
	10	✓	✓					2	32	1
	11	✓	✓					1.5	50	3
	12			✓				1.5	9	0
	13	✓	✓					2.5	30	1
	14	✓	✓					2	46	2
	15	✓	✓					1	15	1
	16	✓	✓					2	30	1
	17	✓	✓					1.5	82	5
	18	✓	✓					1	15	1
	19	✓	✓					1	13	1
	20			✓				3	24	
	21	✓	✓					1.5	24	1
	22	✓	✓					1	20	0
	23					✓		1	18	
	24			✓				2	94	
	25									
TOTALS		19	19	4	0	1				
CUMULATIVE TOTALS		119	119	15	5	8				

COMMENTS:

EMS LABORATORIES INC
Contract Lab

A1147	AMBIENT AIR	DOWNWIND (COARSE)
Sample Number	Industrial Category	Sample Point Description

5-27-82	4289	4196
Date Analyzed	Blank Number	Standard Number

ANALYSIS INFORMATION:

Detection Limit: 150 Fibers per mm^2

Ashed sample X yes ___ no

Amount of Air Filtered: .752 cubic meters

Fields Examined 2

Total Filter Area 960 mm^2

Chrysotile Fibers (all sizes): 250

Chrysotile Concentration:

Calculated Mass 1.9×10^3 ng/m^3

Calculated Fibers 21 $fibers/cc^3$

SCC USE ONLY

DATA INTERPRETATION

___ Shows positive indication of chrysotile asbestos in the ambient air.

___ Shows no indication of chrysotile asbestos in the ambient air.

___ Cannot be interpreted because of the limited number of chrysotile fibers counted.

JUN 1 0 1982

(A. ESTOS DATA REPORT (

Industrial Category: AMBIENT AIR

SAMPLE DATA

Laboratory: EMS LABORATORIES, INC
Lab ID Number: 42391
Date analyzed: 5-27-82
Analyst: B TOOPER
Filter Type: 0.1 μ nuclepore
Preparation technique: modified Jaffe Wick
Method of counting: grid square
Volume of field sample filtered: 0.752

OPERATING CONDITIONS

Mode: TEM
Beam current μA: 35
Sample tilt (°): 0°
Actual screen magnification: x 20,000
Av. grid area (mm²): 0.0079
No. of grid squares counted: 2
Address for grid storage: 92-2-JKL

GRID NUMBER: (I), II, III, IV (circle one)

E R	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION: (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE: (mm) DIAMETER	(mm) LENGTH	ASPECT R
	1	✓	✓					1	16	16
	2	✓	✓					1.5	17	11.3
	3	✓	✓					1	13	13
	4	✓	✓					1	20	20
	5	✓	✓					4	93	23.3
	6			✓				5	45	9
	7	✓	✓					1	22	22
	8	✓	✓					3	25	8.3
	9	✓	✓					3	27	9
	10	✓	✓					4	25	6.3
	11	✓	✓					1	46	46
	12	✓	✓					1	25	25
	13	✓	✓					3	75	25
	14	✓	✓					2	40	20
	15			✓				2	12	6
	16	✓	✓					3	580	193
	17			✓				2	25	12
	18	✓	✓					2	20	10
	19	✓	✓					1.5	10	6
	20	✓	✓					1	25	25
	21			✓				2	18	9
	22	✓	✓					1	20	20
	23	✓	✓					1	14	14
	24	✓	✓					2.5	180	72
	25	✓	✓					1	25	25
TOTALS		21	21	4	0	0				

USE ADDITIONAL PAGE FOR COMMENTS, IF NECESSARY

(cont'd)

Industrial Category: AMBIENT AIR
Page 2 of 12

GRID NUMBER: I, II, III, IV (circle one)

ARE IBER	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE (mm) DIAMETER	(mm) LENGTH	ASPEC
NT	1	✓	✓					2	14	7
	2	✓	✓					1	12	12
	3	✓	✓					1	48	48
	4	✓	✓					3	25	[illegible]
	5	✓	✓					1.5	18	12
	6	✓	✓					1	40	4
	7	✓	✓					1	18	1
	8	✓	✓					1	17	1
	9	✓	✓					1	25	2
	10	✓	✓					1	14	1
	11	✓	✓					1	22	2
	12	✓	✓					1	12	12
	13	✓	✓					1	14	1
	14	✓	✓					1	8	[illegible]
	15	✓	✓					1	10	10
	16	✓	✓					1	14	1
	17	✓	✓					1	17	1
	18	✓	✓					1	25	2
	19	✓	✓					2.5	15	[illegible]
	20			✓				2	16	[illegible]
	21	✓	✓					1	18	1
	22	✓	✓					1.5	20	1
	23	✓	✓					1	15	1
	24	✓	✓					4	60	1
	25	✓	✓					1	8	
TOTALS		24	24	1	0	0				
MULATIVE TOTALS		45	45	5	0	0				

OMMENTS:

TWO ENORMOUS BUNDLES WERE FOUND IN GRID # I

A FEW LARGE BUNDLES WERE FOUND IN GRID # II

(cont d)

Industrial Category: AMBIENT AIR

GRID NUMBER 1, II, III, IV (circle one)

E R	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION: (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE: (mm) DIAMETER	(mm) LENGTH	ASPECT
I	1	✓	✓					1	10	10
	2	✓	✓					1	16	16
	3	✓	✓					1	13	13
	4	✓	✓					1	45	45
	5	✓	✓					2.5	110	44
	6	✓	✓					1	45	45
	7	✓	✓					1	48	48
	8	✓	✓					2	28	14
	9	✓	✓					2	18	9
	10	✓	✓					1	15	15
	11	✓	✓					1	12	12
	12	✓	✓					1	14	14
	13	✓	✓					1	16	16
	14	✓	✓					1	45	45
	15	✓	✓					1.5	30	20
	16	✓	✓					2.5	28	11
	17	✓	✓					1	10	10
	18	✓	✓					1.5	16	10
	19	✓	✓					1	8	8
	20	✓	✓					2	12	6
	21	✓	✓					1	8	8
	22	✓	✓					1	35	35
	23	✓	✓					1.5	8	5
	24	✓	✓					1	16	16
	25	✓	✓					2	12	6
TALS		25	25	0	0	0				
LATIVE TOTALS		70	70	5	0	0				

MENTS:

(cont'd)

EPA Sample No: [illegible]
Industrial Category: AMBIENT AIR
Page 4 of 12

GRID NUMBER (I) II, III, IV (circle one)

(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION: (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE: (mm) DIAMETER	(mm) LENGTH	ASPECT
1	✓	✓					1	18	18
2	✓	✓					2	22	11
3	✓	✓					1	18	18
4	✓	✓					1	20	20
5	✓	✓					1	12	12
6	✓	✓					1	16	16
7	✓	✓					1	18	18
8	✓	✓					1	18	18
9	✓	✓					1.5	8	5
10	✓	✓					2	42	21
11	✓	✓					2.5	27	10
12	✓	✓					1	25	25
13	✓	✓					1	28	28
14	✓	✓					1	48	48
15	✓	✓					1	18	18
16	✓	✓					1	40	40
17	✓	✓					1	15	15
18	✓	✓					2.5	22	8
19	✓	✓					1	55	55
20	✓	✓					1.5	10	6
21	✓	✓					1	42	42
22	✓	✓					1	16	16
23	✓	✓					1.5	180	120
24	✓	✓					1.5	14	9
25	✓	✓					1	53	53
ALS	25	25	0	0	0				
ATIVE TOTALS	95	95	3	0	0				

MENTS:

(cont'd)

Industrial Category: AMBIENT AIR

GRID NUMBER: I, II, III, IV (circle one)

	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE (mm) DIAMETER	(mm) LENGTH	ASPECT
II	1	✓	✓					1.5	10	6.7
	2	✓	✓					1	12	12
	3	✓	✓					1	22	22
	4	✓	✓					1	20	20
	5	✓	✓					1	45	45
	6	✓	✓					1	14	14
	7	✓	✓					1	25	25
	8	✓	✓					2	25	12
	9	✓	✓					2	250	125
	10	✓	✓					2	26	13
	11	✓	✓					1.5	20	13.3
	12	✓	✓					2	8	4
	13	✓	✓					1	10	10
	14	✓	✓					1.5	12	8
	15	✓	✓					2	18	9
	16	✓	✓					1	16	16
	17	✓	✓					2	15	7.5
	18	✓	✓					1	8	8
	19	✓	✓					1	10	10
	20	✓	✓					1.5	10	6.7
	21	✓	✓					2	10	5
	22	✓	✓					1	22	22
	23	✓	✓					1	16	16
	24	✓	✓					2	9	4.5
	25	✓	✓					1.5	14	9.3
TALS		25	25	0	0	0				
LATIVE TOTALS		120	120	5	0	0				

MENTS:

(cont'd)

EPA Sample No: H161T
Industrial Category: AMBIENT AIR
Page 6 of 12

GRID NUMBER: I, II, III, IV (circle one)

(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE (mm) DIAMETER	(mm) LENGTH	ASPECT RA
1	✓	✓					2	12	6
2	✓	✓					1	18	18
3	✓	✓					1	18	18
4	✓	✓					1	50	50
5	✓	✓					1	25	25
6	✓	✓					1	65	65
7	✓	✓					1	18	18
8	✓	✓					1	14	14
9	✓	✓					1	16	16
10	✓	✓					1.5	65	43.3
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
S	10	10	0	0	0				
VE TOTALS	130	130	5	0	0				

NTS:

GRID NUMBER: I, (II) III, IV (circle one)

	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION				POSSIBLE EXDRA ID	FIBER SIZE		ASPECT
			(✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN		(mm) DIAMETER	(mm) LENGTH	
	1	✓	✓					1	22	22
	2	✓	✓					3	12	4
	3	✓	✓					1	5	5
	4	✓	✓					2	8	4
	5	✓	✓					1	8	8
	6	✓	✓					1.5	42	28
	7			✓				1	16	16
	8	✓	✓					2	28	14
	9	✓	✓					1.5	30	20
	10	✓	✓					2	8	4
	11	✓	✓					1.5	10	6.[illegible]
	12	✓	✓					1	14	14
	13	✓	✓					1	16	16
	14	✓	✓					2	65	32.[illegible]
	15	✓	✓					2	15	7.[illegible]
	16	✓	✓					1.5	12	8
	17			✓				10	45	4.[illegible]
	18	✓	✓					1.5	8	5.[illegible]
	19	✓	✓					1	14	14
	20	✓	✓					1	10	10
	21	✓	✓					1	25	25
	22	✓	✓					1	20	20
	23	✓	✓					1.5	18	15
	24	✓	✓					1	16	16
	25	✓	✓					1	38	38
ALS		23	23	2	0	0				[illegible]
ATIVE TOTALS		153	153	7	0	0				[illegible]

MENTS:

(cont d)

Industrial Category: AMBIENT AIR
Page 8 of 12

GRID NUMBER: I (II) III, IV (circle one)

E R	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION: (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE: (mm) DIAMETER	(mm) LENGTH	ASPECT
T.	1	✓	✓					1	8	8
	2	✓	✓					1	22	22
	3	✓	✓					1.5	14	9.3
	4	✓	✓					1.5	18	12
	5	✓	✓					1	10	10
	6			✓				1	8	8
	7	✓	✓					1	8	8
	8			✓				1	10	10
	9	✓	✓					1	14	14
	10	✓	✓					1	45	45
	11	✓	✓					6	38	6.3
	12	✓	✓					1.5	50	33.3
	13	✓	✓					1	20	20
	14			✓				2	45	22
	15	✓	✓					1.5	14	9.3
	16	✓	✓					3	60	20
	17	✓	✓					1	22	22
	18	✓	✓					2	18	9
	19	✓	✓					1	30	30
	20	✓	✓					1	12	12
	21	✓	✓					2	14	7
	22	✓	✓					2	20	10
	23	✓	✓					1	18	18
	24	✓	✓					1	25	25
	25	✓	✓					1	14	14
TALS		22	22	3	0	0				
LATIVE TOTALS		175	175	10	0	0				

MENTS:

GRID NUMBER: I (II) III, IV (circle one)

	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE (mm) DIAMETER	(mm) LENGTH	ASPECT
	1	✓	✓					1	25	25
	2	✓	✓					1	22	22
	3	✓	✓					1.5	18	12
	4	✓	✓					1	22	22
	5	✓	✓					1	10	10
	6	✓	✓					2.5	52	20
	7	✓	✓					1	18	18
	8	✓	✓					1	14	14
	9	✓	✓					1.5	16	10
	10	✓	✓					2	18	9
	11	✓	✓					1.5	12	8
	12	✓	✓					1	25	25
	13	✓	✓					1	20	20
	14	✓	✓					1.5	22	14
	15	✓	✓					1.5	22	14
	16	✓	✓					1	30	30
	17	✓	✓					1	8	8
	18	✓	✓					1	20	20
	19	✓	✓					1	22	22
	20	✓	✓					1	20	20
	21	✓	✓					1	8	[illegible]
	22	✓	✓					1	25	2[illegible]
	23	✓	✓					1	10	10
	24	✓	✓					1	14	1[illegible]
	25	✓	✓					1	16	16
TALS		25	25	0	0	0				
LATIVE TOTALS		200	200	10	0	0				

MENTS:

GRID NUMBER: I, II, III, IV (circle one)

	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION: (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE: (mm) DIAMETER	(mm) LENGTH	ASPECT
T.	1	✓	✓					1.5	200	133.
	2	✓	✓					1	8	8
	3	✓	✓					2	55	27.
	4	✓	✓					1	10	10
	5			✓				1	16	16
	6	✓	✓					1	6	6
	7			✓				1	18	18
	8	✓	✓					1	17	17
	9	✓	✓					1.5	22	14.
	10	✓	✓					1.5	52	34.
	11	✓	✓					1.5	50	33.
	12	✓	✓					2	60	30
	13	✓	✓					1	14	14
	14	✓	✓					1	22	22
	15					✓		1	15	15
	16	✓	✓					1	20	20
	17	✓	✓					1	12	12
	18	✓	✓					1	12	12
	19	✓	✓					1.5	8	5.
	20	✓	✓					1.5	14	9.
	21	✓	✓					2	20	10
	22	✓	✓					1	18	18
	23	✓	✓					1	14	14
	24	✓	✓					1	16	16
	25	✓	✓					1	12	12
S		22	22	2	0	1				
IVE TOTALS		222	222	12	0	1				

ENTS:

Industrial Category: AMBIENT AIR
Page 11 of 12

GRID NUMBER: I (II) III, IV (circle one)

	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION: (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE: (mm) DIAMETER	(mm) LENGTH	ASPECT R
T.	1	✓	✓					1	12	12
	2	✓	✓					1	8	8
	3	✓	✓					1	6	6
	4	✓	✓					1.5	18	12
	5	✓	✓					1	25	25
	6	✓	✓					1.5	14	9.[illegible]
	7	✓	✓					1.5	25	16.[illegible]
	8	✓	✓					1.5	28	18.[illegible]
	9	✓	✓					1	35	35
	10	✓	✓					1.5	18	12
	11	✓	✓					1	20	20
	12	✓	✓					2	18	9
	13	✓	✓					2	20	10
	14	✓	✓					1	18	18
	15	✓	✓					1	22	22
	16	✓	✓					1	18	18
	17	✓	✓					1.5	38	25
	18	✓	✓					2	18	9
	19	✓	✓					14	8.5	6
	20	✓	✓					1.5	28	18.[illegible]
	21	✓	✓					1	22	2[illegible]
	22	✓	✓					1	18	18
	23	✓	✓					2	18	[illegible]
	24	✓	✓					1.5	15	10
	25	✓	✓					1	20	20
TALS		25	25	0	0	0				
LATIVE TOTALS		247	247	12	0	1				

MENTS:

JUN 1 6 1992

EMS LABORATORIES INC
Contract Lab

DAWNWINS FINE
Sample Point Description

4196
Standard Number

s per mm^2

meters

RESERVED

/m^3

ers/cc^3

s in the ambient air.
he ambient air.
mber of chrysotile fibers

7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25							
																	0	1							
																	0	0							
																	0	12							
																	3	250							
																	3	250							

OTALS
UMULATIVE TOTALS
OMMENTS:

DATA SUMMARY SHEET

JUN 1 6 1982.

EMS LABORATORIES INC.
Contract Lab

A1619
Sample Number

AMBIENT AIR
Industrial Category

BLANK
Sample Point Description

5-29-82
Date Analyzed

4289
Blank Number

4196
Standard Number

ANALYSIS INFORMATION:

Detection Limit: 15 Fibers per mm^2

Ashed sample X yes ___ no

Amount of Air Filtered: 0 (BLANK) cubic meters

Fields Examined 20

Total Filter Area 960 mm^2

Chrysotile Fibers (all sizes): 1

Chrysotile Concentration:

Calculated Mass NA ng/m^3

Calculated Fibers NA $fibers/cc^3$

SCC USE ONLY

DATA INTERPRETATION

___ Shows positive indication of chrysotile asbestos in the ambient air.

___ Shows no indication of chrysotile asbestos in the ambient air.

___ Cannot be interpreted because of the limited number of chrysotile fibers counted.

ASBESTOS DATA REPORT
(cont'd)

EPA Sample No: A1619
Industrial Category: BLANK
Page 2 of 2

GRID NUMBER: I, (II), III, IV (circle one)

E R	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXTRA ID	FIBER SIZE (mm) DIAMETER	(mm) LENGTH	ASPECT R
	1									
	2			✓				1.5	10	6.7
	3									
	4									
	5									
	6									
	7									
	8									
	9									
	10									
	11									
	12									
	13									
	14									
	15									
	16									
	17									
	18									
	19									
	20									
	21									
	22									
	23									
	24									
	25									
ALS		0	0	1	0	0				
ATIVE TOTALS		1	1	1	0	0				

MENTS:

JUN 1 0

EMS LABORATORIES INC.
Contract Lab

A 1613
Sample Number

AMBIENT AIR
Industrial Category

UPWIND (COARSE)
Sample Point Description

5-24-82
Date Analyzed

4289
Blank Number

4196
Standard Number

ANALYSIS INFORMATION:

Detection Limit: 15 Fibers per mm^2

Ashed sample X yes ___ no

Amount of Air Filtered: 0.685 cubic meters

Fields Examined 20

Total Filter Area 960 mm^2

Chrysotile Fibers (all sizes): 73

Chrysotile Concentration:

Calculated Mass 38 ng/m^3

Calculated Fibers 0.7 $fibers/cc^3$

SCC USE ONLY

DATA INTERPRETATION

___ Shows positive indication of chrysotile asbestos in the ambient air.

___ Shows no indication of chrysotile asbestos in the ambient air.

___ Cannot be interpreted because of the limited number of chrysotile fibers counted.

1 6 1982

ASBESTOS DATA REPORT

EPA Sample No: A1613
Industrial Category: AMBIENT AIR
Page 1 of 6

SAMPLE DATA

Laboratory: EMS LABORATORIES INC
Lab ID Number: 42334
Date analyzed: 5-24-82
Analyst: B. TOOPER
Filter Type: 0.1 nanuclepore
Preparation technique: modified Jaffe Wick
Method of counting: grid square
Volume of field sample filtered: 0.635

OPERATING CONDITIONS

Mode: TEM
Beam current μA: 35
Sample tilt (°): 0°
Actual screen magnification: x20,000
Av. grid area (mm²): 0.0175
No. of grid squares counted: 20
Address for grid storage: 92-1-JKL

GRID NUMBER: (I) II, III, IV (circle one)

E R	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION: (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE: (mm) DIAMETER	(mm) LENGTH	ASPECT RAT
	1	✓	✓					2	10	5
	2	✓	✓					1.5	14	9.3
	3			✓				2.5	11	4.4
	4	✓	✓					1.5	16	10.6
	5	✓	✓					1	14	14
	6	✓	✓					1	12	12
	7			✓				1	8	8
	8	✓	✓					2	23	11.5
	9	✓	✓					1.5	9	6
	10	✓	✓					2.5	102	40.8
	11			✓				2.5	14	5.6
	12					✓		1.5	10	6.7
	13	✓	✓					1.5	18	12
	14	✓	✓					1.5	25	16.7
	15	✓	✓					1.5	23	15.3
	16	✓	✓					1	25	25
	17				✓			1	18	18
	18	✓	✓					1	67	6.7
	19	✓	✓					1	22	22
	20			✓				2	8	4
	21			✓				3	28	9.3
	22			✓				1.5	10	6.7
	23				✓			1.5	15	10
	24	✓	✓					1.5	12	8
	25	✓	✓					1	40	40
TOTALS		16	16	6	2	1				

USE ADDITIONAL PAGES FOR COMMENTS, IF NECESSARY

(cont'd)

EPA Sample No: [illegible]
Industrial Category: AMBIENT AIR
Page 2 of 6

GRID NUMBER (I) II, III, IV (circle one)

	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION				POSSIBLE EXDRA ID	FIBER SIZE		ASPECT
			(✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN		(mm) DIAMETER	(mm) LENGTH	
	1			✓				1	12	12
	2	✓	✓					1	10	10
	3	✓	✓					1	12	12
	4	✓	✓					1	73	73
	5					✓		1.5	40	26.7
	6	✓	✓					1	14	14
	7	✓	✓					2	13	6.5
	8	✓	✓					1.5	13	8.7
	9	✓	✓					1	13	13
	10	✓	✓					1	14	14
	11			✓				3	14	4.7
	12	✓	✓					1	40	40
	13	✓	✓					1	38	38
	14			✓				1	11	11
	15	✓	✓					1	47	47
	16			✓				2.5	12	4.8
	17	✓	✓					2	17	8.5
	18			✓				2	40	20
	19			✓				1	14	14
	20	✓	✓					2	60	30
	21	✓	✓					1.5	20	13.3
	22	✓	✓					2	50	25
	23	✓	✓					1.5	40	26.7
	24	✓	✓					2	10	5
	25	✓	✓					1.5	14	9.3
LS		13	18	6	0	1				
IIVE TOTALS		34	34	12	2	2				

IENTS:

EPA Sample No: N1C1-
Industrial Category: AMBIENT AIR
Page 3 of 6

GRID NUMBER: I, II, III, IV (circle one)

ARE IBER	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION: (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE: (mm) DIAMETER	(mm) LENGTH	ASPEC
...T.	1	✓	✓							
	2							1.5	20	13
	3									
	4									
	5									
	6									
	7									
	8									
	9									
	10									
	11									
	12									
	13									
	14									
	15									
	16									
	17									
	18									
	19									
	20									
	21									
	22									
	23									
	24									
	25									
ALS		1	1	0	0	0				
ATIVE TOTALS		35	35	12	2	2				

MENTS:

(cont'd)

EPA Sample No: [illegible]
Industrial Category: AMBIENT AIR
Page 6 of 6

GRID NUMBER: I, II, III, IV (circle one)

RE R	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE (mm) DIAMETER	(mm) LENGTH	ASPECT
	1	✓	✓					1	27	27
	2	✓	✓					1	10	10
	3			✓				1	12	12
	4	✓	✓					1	17	17
	5	✓	✓					1	15	15
	6	✓	✓					2	10	5
	7	✓	✓					1	24	24
	8			✓				1.5	8	5.3
	9	✓	✓					1	43	43
	10									
	11									
	12									
	13									
	14									
	15									
	16									
	17									
	18									
	19									
	20									
	21									
	22									
	23									
	24									
	25									
TALS		7	7	2	0	0				
LATIVE TOTALS		73	73	29	9	4				

IMENTS:

EMS LABORATORIES INC
Contract Lab

614
le Number

AMBIENT AIR
Industrial Category

UPWIND AIR SAMPLE (FINE)
Sample Point Description

25-82
Analyzed

4289
Blank Number

4196
Standard Number

SIS INFORMATION:

Detection Limit: 15 Fibers per mm^2

Ashed sample X yes ___ no

Amount of Air Filtered: 6.15 cubic meters

Fields Examined 20

Total Filter Area 960 mm^2

Chrysotile Fibers (all sizes): 17

Chrysotile Concentration:

Calculated Mass 0.9 ng/m^3

Calculated Fibers 2×10^{-2} $fibers/cc^3$

SE ONLY

DATA INTERPRETATION

Shows positive indication of chrysotile asbestos in the ambient air.

Shows no indication of chrysotile asbestos in the ambient air.

Cannot be interpreted because of the limited number of chrysotile fibers counted.

USE ADDITIONAL PAGES IF NECESSARY · COMMENTS, IF NECESSARY

0
0
3
15
15
24
25
TOTALS

(cont'd)

EPA Sample No: [illegible]
Industrial Category: AMBIENT AIR
Page 2 of 2

GRID NUMBER: I, (II), III, IV (circle one)

RE ER	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE (mm) DIAMETER	(mm) LENGTH	ASPEC
	1			✓				1	12	12
	2	✓	✓					1.5	17	11.3
21)	3									
	4					✓		1	20	20
	5									
	6	✓	✓					2	14	7
	7			✓				1	7	7
	8									
	9					✓		2	33	16.5
	10									
	11									
	12									
	13									
	14									
	15									
	16									
	17									
	18									
	19									
	20									
	21									
	22									
	23									
	24									
	25									
OTALS		2	2	2	0	2				
ULATIVE TOTALS		17	13	5	0	2				

MMENTS: BUNDLES OF FIBERS FOUND IN SQUARES 8, 9, AND 10 OF GRID # I.

DATA SUMMARY SHEET

JUN 1 0 1982

EMS LABORATORIES INC
Contract Lab

A1615
Sample Number

AMBIENT AIR
Industrial Category

MIDSITE (COARSE)
Sample Point Description

5-26-82
Date Analyzed

4289
Blank Number

4196
Standard Number

ANALYSIS INFORMATION:

Detection Limit: 150 Fibers per mm^2

Ashed sample X yes ___ no

Amount of Air Filtered: 0.752 cubic meters

Fields Examined 2

Total Filter Area 960 mm^2

Chrysotile Fibers (all sizes): 144

Chrysotile Concentration:

Calculated Mass 450 $ng/^3$

Calculated Fibers 12 $fibers/cc^3$

SCC USE ONLY

DATA INTERPRETATION

___ Shows positive indication of chrysotile asbestos in the ambient air.

___ Shows no indication of chrysotile asbestos in the ambient air.

___ Cannot be interpreted because of the limited number of chrysotile fibers counted.

Laboratory: [illegible]
Lab ID Number: 42B9
Date analyzed: 5-26-87
Analyst: B. Toope
Filter Type: 0.1 μ nuclepore
Preparation technique: modified Jaffe Wick
Method of counting: grid square
Volume of field sample filtered: 0.752

Mode: TEM
Beam current μA: 5
Sample tilt (°): 0°
Actual screen magnification: x 20,000
Av. grid area (mm²): 0.0075 mm²
No. of grid squares counted: 2
Address for grid storage: 9.2-.2-DEF

GRID NUMBER: (I) II, III, IV (circle one)

ARE BER	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION: (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE: (mm) DIAMETER	(mm) LENGTH	ASPECT RA
	1	✓	✓					1	10	10
	2			✓				1.5	8	5.3
	3	✓	✓					1	22	22
	4	✓	✓					1	30	30
	5	✓	✓					1.5	15	10
	6	✓	✓					1.5	25	16.7
	7	✓	✓					1	10	10
	8	✓	✓					1	14	14
	9	✓	✓					1	10	10
	10	✓	✓					2	90	45
	11	✓	✓					1.5	65	43.3
	12	✓	✓					1	45	45
	13	✓	✓					1	20	20
	14	✓	✓					1.5	7	4.7
	15	✓	✓					2	10	5
	16	✓	✓					4	12	3
	17	✓	✓					1.5	20	13.3
	18	✓	✓					1	85	85
	19	✓	✓					1	14	14
	20	✓	✓					1.5	100	66.7
	21	✓	✓					4	12	3
	22	✓	✓					1.5	14	9.3
	23	✓	✓					1	20	20
	24	✓	✓					1.5	15	10
	25		✓					4	14	3.5
TOTALS		24	24	1	0	0				

USE ADDITIONAL PAGES FOR COMMENTS, IF NECESSARY

(cont'd)

EPA Sample No. _____
Industrial Category: AMBIENT AIR
Page 3 of 7

GRID NUMBER (1) II, III, IV (circle one)

QUARE UMBER	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION: (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE: (mm) DIAMETER	(mm) LENGTH	ASPE
CONT.	1	✓	✓					1	.28	2
	2	✓	✓					1	.60	6
	3	✓	✓					1	.12	1
	4	✓	✓					1.5	.27	1
	5	✓	✓					1	.35	3
	6	✓	✓					1	.14	1
	7	✓	✓					2	.20	1
	8	✓	✓					2	.30	1
	9	✓	✓					1	.22	2
	10	✓	✓					1	.20	2
	11	✓	✓					1	.10	1
	12	✓	✓					1	.14	1
	13	✓	✓					1.5	.16	10
	14	✓	✓					1	.45	4
	15	✓	✓					1	.32	[illegible]
	16	✓	✓					1	.17	1
	17	✓	✓					1	.28	[illegible]
	18	✓	✓					1.5	.30	[illegible]
	19	✓	✓					1	.14	[illegible]
	20	✓	✓					1.5	.12	[illegible]
	21	✓	✓					1	.16	1
	22	✓	✓					1	.10	1
	23	✓	✓					1	.14	1
	24	✓	✓					1	.55	5
	25	✓	✓					1	.20	2
TOTALS		25	25	0	0	0				
CUMULATIVE TOTALS		73	73	2	0	0				

COMMENTS:

GRID NUMBER: I, II, III, IV (circle one)

SRE IER	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE (mm) DIAMETER	(mm) LENGTH	ASPEC
SAT.	1	✓	✓					1	20	20
	2	✓	✓					2	72	3
	3	✓	✓					1	20	2
	4	✓	✓					1	14	14
	5	✓	✓					6.5	68	4
	6	✓	✓					1	48	4
	7	✓	✓					1	60	6
	8	✓	✓					1	45	4
	9	✓	✓					1	20	2
	10	✓	✓					2.5	26	10.
	11	✓	✓					2	22	11
	12	✓	✓					1.5	14	9.
	13	✓	✓					1.5	25	16.
	14	✓	✓					1	20	2
	15	✓	✓					1	8	8
	16									
	17									
	18									
	19									
	20									
	21									
	22									
	23									
	24									
	25									
OTALS		15	15	0	0	0				
ATIVE TOTALS		88	88	2	0	0				

MENTS:

GRID NUMBER: I (II) III, IV (circle one)

SQUARE NUMBER	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION: (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE: (mm) DIAMETER	(mm) LENGTH	AS
1	1	✓	✓					1	16	
	2	✓	✓					1.5	24	
	3	✓	✓					1.5	16	
	4					✓		1	14	
	5	✓	✓					1.5	21	
	6	✓	✓					1	13	
	7	✓	✓					1	8	
	8	✓	✓					4	34	
	9	✓	✓					1.5	40	
	10	✓	✓					2	33	
	11	✓	✓					1.5	28	
	12	✓	✓					2	65	
	13	✓	✓					2	36	
	14	✓	✓					2	17	
	15	✓	✓					1.5	22	
	16					✓		1	14	
	17	✓	✓					1.5	14	
	18	✓	✓					1.5	15	
	19	✓	✓					2	20	
	20	✓	✓					1	37	
	21	✓	✓					1	27	
	22	✓	✓					1	12	
	23	✓	✓					2	44	
	24	✓	✓					1.5	10	
	25	✓	✓					2.5	20	
TOTALS		23	23	0	0	2				
CUMULATIVE TOTALS		111	111	2	0	2				

COMMENTS:

(cont'd)

Industrial Category: AMBIENT AIR
Page 6 of 7

GRID NUMBER: I, (II), III, IV (circle one)

JARE MBER	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE (mm) DIAMETER	(mm) LENGTH	ASPECT
ONT	1	✓	✓					1.5	33	25.3
	2	✓	✓					2	27	13
	3	✓	✓					2	22	11
	4					✓		2	23	11.5
	5			✓				2	18	9
	6	✓	✓					3	24	8
	7	✓	✓					2	22	11
	8	✓	✓					1.5	13	8.
	9	✓	✓					2	11	5
	10			✓				3	16	5.
	11			✓				3	12	4
	12					✓		1	7	7
	13	✓	✓					1	8	8.
	14	✓	✓					1.5	22	14.
	15	✓	✓					1.5	10	6.3
	16	✓	✓					2	30	15
	17	✓	✓					1	17	17
	18	✓	✓					1	10	10
	19	✓	✓					1	9	9
	20	✓	✓					1	17	17
	21	✓	✓					2	45	22
	22	✓	✓					1	8	8
	23	✓	✓					1	12	1
	24	✓	✓					2	7	3.
	25	✓	✓					2	22	11
TOTALS		20	20	3	0	2				
MULATIVE TOTALS		131	131	3	0	7				

OMMENTS:

ASBESTOS DATA REPORT
(cont'd)

EPA Sample No: 41612
Industrial Category: AMBIENT AI
Page 1 of 1

GRID NUMBER: I, II, III, IV (circle one)

SQUARE NUMBER	(✓) FIBER NUMBER	(✓) CHRYSOTILE MORPHOLOGY?	POSITIVE DIFFRACTION PATTERN IDENTIFICATION (✓) CHRYSOTILE	(✓) OTHER FIBERS (NON-CHRYSOTILE)	(✓) AMBIGUOUS PATTERN	(✓) NO SAED PATTERN	POSSIBLE EXDRA ID	FIBER SIZE (mm) DIAMETER	(mm) LENGTH	ASPI
DCONT	1	✓	✓					1	11	1
	2	✓	✓					1	20	2
	3	✓	✓					1	30	3
	4					✓		1	15	1
	5	✓	✓					2	100	3
	6	✓	✓					1	9	
	7					✓		2	9	
	8	✓	✓					1	19	
	9	✓	✓					1	28	
	10	✓	✓					2	18	
	11	✓	✓					1	15	
	12	✓	✓					1	9	
	13	✓	✓					1	13	
	14	✓	✓					2	14	
	15	✓	✓					1	29	
	16			✓				2	15	
	17									
	18									
	19									
	20									
	21									
	22									
	23									
	24									
	25									
TOTALS		13	13	1	-0-	2				
CUMULATIVE TOTALS		144	144	6	-0-	6				

COMMENTS: