FILE NAME: General Dynamics (GED)

DATE: 1972-1975

DOC#: GED003

DOCUMENT DESCRIPTION: Notes on Airborne Asbestos Samples

CALIBRATION OF 3.0 LITER ORIFICE

9.60	9.35	
9.40	9.35	Average 9.475 sec./500 ml
9.40	9.50	Soap bubble flow meter
9.45	9.30	
9.45	9.35	

9.45 : 500 = 60 : V

V = 3186 ml

CALIBRATION OF 1.0 LITER ORIFICE

37.30	37.45	
37.80	36.80	Average 3730
37.55	37.10	
37.55	36.90	
37.60	36.95	

37.30 : 500 = 60 : V

V = 804 ml

CALIBRATION OF 4.9 LITER ORIFICE

7.40	7.55	
7.45	7.40	Average 7.40
7.30	7.45	
7.25	7.35	
7.40	7.45	

7.40 : 500 = 60 : V

V = 4054 ml

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CALIBRATION OF 10.0 LITER ORIFICE

3.28	3.35	
3.30	3.40	Average 3.33
3.30	3.38	
3.40	3.26	
3.30	3.30	

3.33 : 500 = 60 : K

K = 9011 ml

CALIBRATION OF 14.0 LITER ORIFICE

2.40	2.45	
2.35	2.45	Average 2.45
2.45	2.50	
2.55	2.40	
2.50	2.45	

2.45 : 500 = 60 : K

K = 12,245 ml

EFFECTIVE FILTERING AREA 35MM DIA FILTER

$A = 0.7854\, d^2$

$= 0.7854\,(35)^2$

$= 962\ mm^2$

EB-CAM-002407

TOTAL OPTICAL FIELD AT 400 X (R-D ANALYX Microscope)

$A = 0.7854 d^2$

$= 0.7854 (0.28)^2$

$= 0.061 \text{ mm}^2$

GRADUATED RETICULE 1 UNIT = 2.33 μ

$\frac{\text{FILTER AREA mm}^2}{\text{FIELD AREA mm}^2} = \frac{962}{0.061} = 15,770 \text{ (K)}$

$\frac{\text{TOTAL NUMBER COUNTED} \times 15,770}{\text{NUMBER FIELDS COUNTED}} = \text{FIBERS/ml}$

$\text{ml/min} \times \text{TIME (min)}$

12-21-72 0820 [70000] LAGGING SHOP M. HEBB (12555) SUPERVISOR

SAMPLE #1 SOUTH END OF SHOP — STOWAGE AREA — WALK THRU TO TOILETS

3.0 L ORIFICE - 30 MINUTES

$\frac{\frac{17}{28} \times 15,770}{3186 \times 30} = \frac{9572}{95,580} = 0.1 \text{ FIBERS/ML}$

12/21/72 0855 [70001]

SAMPLE #2 WEST SIDE STOWAGE ROOM

3 PEOPLE — 30 MIN.

$\frac{\frac{17}{28} \times 15,770}{3186 \times 30} = \frac{9572}{95,560} = 0.1 \text{ FIBERS/ML}$

4

12/21/72 Sample #3 Middle Work Bench
0930 12 People working - Vent off
90002 30 min.

$$\frac{\frac{14}{31} \times 15,770}{3186 \times 30} = \frac{7121}{95,580} = .07 \text{ fibers/ml}$$

12/21/72 Sample #4 Felt Asbestos Work Bench
1010 North End - 2 People working
90003 Vent off - 30 min

$$\frac{\frac{34}{33} \times 15,770}{3186 \times 30} = \frac{16,243}{95,580} = 0.17 \text{ fibers/ml}$$

12/21/72 Sample #5 Lay out Table - North End
1045 Vent off - 6 People working
90004 30 min.

$$\frac{\frac{3}{26} \times 15,770}{3186 \times 30} = \frac{1813}{95,580} = 0.002 \text{ fiber/ml}$$

12/21/72 Sample #6 Mud mixing area - 1 man
1240 winding wire in area -
90005 30 min sample

$$\frac{\frac{15}{26} \times 15,770}{3186 \times 30} = \frac{8988}{95,580} = 0.09 \text{ fiber/ml}$$

EPA CAM 002409

12/21/72 Sample #7 Cutting asbestos on band saw
1325 North end of shop
90006 R. St. Martin 246-2370 (cutter)
G. Martel 246-5492 1 (helper)
Both men wearing respirators
Over the shoulder sample on
St. Martin - 16 min.

$$\frac{\frac{37}{28} \times 15,770}{3186 \times 16} = \frac{20,500}{50,976} = 0.4 \text{ fiber/mL}$$

12/21/72 Sample #8 Sewing table - down wind of
1350 cutting saw Beaulieu 246-2076
90007 30 min.

$$\frac{\frac{17}{28} \times 15,770}{3186 \times 30} = \frac{9462}{95,580} = 0.1 \text{ fiber/mL}$$

12/21/72 Sample #9 Badge #6 No one in shop
1430 Sample at south end band saw
30 min.

$$\frac{\frac{1}{32} \times 15,770}{3186 \times 30} = \frac{3469}{95,580} = 0.04 \text{ fiber/mL}$$

12/21/72 SAMPLE #10 BARGE #6
1505 OFFICE AREA - ONE MAN
90,009 30 MIN

$$\frac{\frac{14}{28} \times 15,770}{3186 \times 30} = \frac{7885}{95,580} = 0.08 \text{ FIBER/ML}$$

12/22/72 SAMPLE #11 BARGE #6
0810 STOWAGE AREA BELOW DECKS
90010 NO PERSONNEL — 30 min

$$\frac{\frac{10}{26} \times 15,770}{3186 \times 30} = \frac{5992}{95,580} = 0.06 \text{ FIBER/ML}$$

12/22/72 SAMPLE #12 BARGE #6
0815 LOCKER RM - NO PERSONNEL
90011 30 min.

$$\frac{\frac{3}{36} \times 15,790}{3186 \times 30} = \frac{1262}{95,580} = 0.001 \text{ FIBER/ML}$$

3/29/73 Sample #1 685 Boat Engine Room Lower Level
1046 Main Turbine Lagging

$$\frac{\frac{30}{50} \times 15,770}{3186 \times 30} = \frac{10,408}{95,580} = 0.11 \text{ Fiber/ml}$$

3/29/73 Sample #2 685 Boat Engine Room Lower Level
1315 Main Turbine Lagging

$$\frac{\frac{5}{47} \times 15,770}{3186 \times 30} = \frac{1671}{95,580} = 0.02 \text{ Fiber/ml.}$$

Asbestos samples by D. Eastes, Bio Environmental Health Center Industrial Hygienist —

Date	Sample Period Began	Sample Period Ended	Sampler Location	Asbestos Concentration (fibers/ml >5μ)
5/21/73	10:20	1535	Bldg. 154, 1st Floor, N. end	0.02
5/21/73	10:30	15:20	Bldg. 154, 2nd Floor, RAD-Control office	0.03
5/21/73	1025	1517	Bldg. 154, 3rd Floor, Pipe covering shop Suspended over Table. E. of supervisor's office	0.21
5/22/73	1410	1640	Barge #6, on storage shelf on W. side, approximately 6 feet high	0.05

Date	Sample Period Began	Sample Period Ended	Sampler Location	Asbestos Concentration (Fibers/ml >5μ
5/23/73	0805	1605	Bldg. 154, 3rd Floor, Pipe covering shop suspended over a table E. of supervisors office	0.20
5/23/73	0735	1453	Barge #6, suspended above N. cutting Table	0.17

ASBESTOS SAMPLES by K. G. Knauss, Electric Boat Division Industrial Hygienist 3rd floor and 1/5/10

ASBESTOS LAGGING SHOP Building #154, ~~2nd FL~~

9/4/73 Sample #KK-001 Sewing lagging with wire inserted asbestos thread. Operato exposure sample. S/W area. J. Wilkos 246-21048

$$\frac{101}{94} \times \frac{19024}{1890 \times 120} = \frac{20356}{226800} = 0.09 \text{ Fiber/ml. } >5\mu$$

9/4/73 Sample #KK-002 DoAll Saw. Cutting Thermobestos (Johns-Manville) U.S.B.M. N.I.O.S.H. approved air purifying respirator worn. Breathing Zone sample. J. Wirth 246-64315 (Asbestos Lagging Shop)

$$\frac{102}{43} \times \frac{19024}{1830 \times 114} = \frac{45087}{208620} = 0.22 \text{ Fiber/ml. } >5\mu$$

Date

9/4/73 Sample #KK-003 Asbestos lagging shop Bldg. 154, ~~2nd Floor~~ 3rd Floor MW 1/9/82
Manual sewing. Wax coated, wire inserted asbestos thread being used. Operator's breathing zone.

$$\frac{7}{8} \times \frac{19024}{1830 \times 120} = \frac{16741}{219600} = 0.08 \text{ Fibers/ml.} > 5\mu$$

J. Wilkos 246/21048

9/4/73 Sample #KK-004 Asbestos lagging shop, Bldg. #154 ~~2nd Fl.~~ 3rd Floor MW 1/9/82
Do All saw. Cutting Thermobestos (Johns-Manville) Breathing zone sample, U.S.B.M.-N.I.O.S.H. approved air purifying respirator worn
J. Wirth 246/64315

$$\frac{7}{8} \times \frac{19024}{1890 \times 120} = \frac{16741}{226800} = 0.07 \text{ Fibers/ml.} > 5\mu$$

9/5/73 Sample #KK-005 Asbestos lagging shop, Bldg. 154
Manual sewing. Wax coated, wire inserted asbestos thread being used. Breathing zone sample.
A. Demers 246/22937

$$\frac{1}{8} \times \frac{19024}{1830 \times 170} = \frac{1065}{311100} = 0.003 \text{ Fibers/ml} > 5\mu$$

Date

9/5/73 Sample #KK-006 Asbestos Lagging Shop, Bldg. 154, ~~2nd Floor~~ 1/5/82 3 ℓ µ. 9
Manual cutting, glueing, etc. on a Chill Water Flow Fitting. N/E area.
Breathing Zone Sample
R. Foster 246/64428

$$\frac{\frac{2}{8} \times 19024}{1890 \times 150} = \frac{4756}{283500} = 0.02 \text{ Fibers/ml} > 5\mu$$

9/5/73 Sample #KK-007 Asbestos Lagging Shop, Bldg. 154, ~~2nd Floor~~ 1/5/82 3 ℓ µ. 9
Manual cutting, glueing, etc. on a Chill Water Flow Fitting. N/E area
Breathing Zone Sample
R. Foster 246/64428

$$\frac{\frac{1}{8} \times 19024}{1890 \times 120} = \frac{2473}{226800} = 0.01 \text{ Fibers/ml} > 5\mu$$

9/5/73 Sample #KK-008 Asbestos Lagging Shop, Bldg. 154, ~~2nd Flr.~~ mw 1/5/82 3 ℓ µ. 9
Manual sewing with wax coated, wire inserted asbestos thread.
S/W area. Operator's breathing zone sample.
A. Demers 246/22937

$$\frac{\frac{9}{8} \times 19024}{1830 \times 123} = \frac{21497}{225090} = 0.10 \text{ Fibers/ml} > 5\mu$$

9/6/73 Sample #KK-009 Asbestos Lagging Shop, Bldg. 154, ~~2nd Floor~~ mw 1/5/82 3 ℓ µm 9
Making valve flange pads. Asbestos cloth containing ~65% asbestos was used. Breathing zone sample
J. Holmgren 246/55198

Date

9/6/73 Sample #KK-010 Asbestos Lagging Shop, Bldg. #154, ~~2nd Fl.~~ 3rd Fl.
Machine sewing asbestos strip for valve flange pads. (North end)
Breathing zone sample
E. Avery 246/12561

$$\frac{\frac{3}{8} \times 19024}{1890 \times 18} = \frac{7229}{34020} = 0.21 \text{ Fibers/ml.} > 5\mu$$

9/6/73 Sample #KK-011 Asbestos Lagging Shop, Bldg. #154, ~~2nd Fl.~~ 3rd Fl.
Do All Saw. Sawing asbestos. USBM-N.I.O.S.H. approved air purifying respirator worn. Breathing zone sample.
E. Avery 246/12561

$$\frac{\frac{3}{8} \times 19024}{1890 \times 30} = \frac{7229}{56700} = 0.13 \text{ Fibers/ml.} > 5\mu$$

9/6/73 Sample #KK-012 Asbestos Lagging Shop, Bldg. #154, ~~2nd Fl.~~ 3rd Fl.
Making valve flange pads. ~65% asbestos cloth being used. Breathing zone sample.
J. Holmgren 246/55198

$$\frac{\frac{3}{8} \times 19024}{1830 \times 145} = \frac{7229}{265350} = 0.03 \text{ Fibers/ml.} > 5\mu$$

9/6/73 Sample #KK-013 Asbestos Lagging Shop, Bldg. #154, ~~2nd Fl.~~ 3rd Fl.
Machine sewing of spray shields (aluminum coating on one side).
Machine located at north end. Breathing zone sample, E. Avery 246-12561

$$\frac{\frac{13}{8} \times 19024}{1890 \times 215} = \frac{31009}{406350} = 0.08 \text{ Fibers/ml.} > 5\mu$$

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Date

9/7/73 Sample #KK-014 616 Boat - Installation of rubber lagging. USBM - NIOSH approved air purifying respirator worn. Breathing zone sample. C. Tisdale 246/37613

$$\frac{\frac{15}{8} \times 19024}{1890 \times 147} = \frac{35765}{277830} = 0.13 \text{ Fibers/ml.} > 5\mu$$

9/7/73 Sample #KK-015 616 Boat - Installation of rubber lagging. USBM - NIOSH approved air purifying respirator worn. Breathing zone sample. C. Tisdale 246/37613

$$\frac{\frac{12}{8} \times 19024}{1890 \times 167} = \frac{28536}{315630} = 0.09 \text{ Fibers/ml.} > 5\mu$$

9/7/73 Sample #KK-016 Asbestos lagging shop. Wire inserted wax coated asbestos thread used while performing manual sewing. Breathing zone sample. L. Brown 246/32882

$$\frac{\frac{3}{8} \times 19024}{1830 \times 140} = \frac{7229}{256200} = 0.03 \text{ Fibers/ml.} > 5\mu$$

9/18/73 Sample #KK-017 Asbestos Barge. Do All Saw. Sawing asbestos scrap (high percentage - no longer used) for disposal and Calsilite for installation on 685 Boat. USBM - NIOSH approved air purifying respirator worn. J. Cochran 246-49926 Breathing zone sample.

$$\frac{\frac{194}{20} \times 19024}{1830 \times 23} = \frac{184533}{42090} = 4.38 \text{ Fibers/ml} > 5\mu$$

Date

9/18/73 Sample

9/18/73

9/18/73

Date

9/18/73 Sample #KK-018 Asbestos Barge. Delta Saw. Sawing asbestos scrap (high percentage) for disposal and Calsilite-SS for installation on 685 Boat. This sample was taken while the Do All Saw was also operating (Sample #KK-017). USBM-NIOSH approved air purifying respirator worn. Breathing zone sample.
L. Johnson 246-~~49926~~ 6?31

$$\frac{\frac{236}{20} \times 19024}{1890 \times 20} = \frac{224483}{37800} = 5.94 \text{ Fibers/ml.} > 5\mu$$

9/18/73 Sample #KK-019 685 Boat. Installing insulation on main propulsion turbine. Calsilite-SS used. USBM-NIOSH approved air purifying respirator worn. Breathing zone sample.
L. Johnson 246-60981

$$\frac{\frac{101}{73} \times 4^{*} \times 19024}{1890 \times 64} = \frac{105012}{120960} = 0.87 \text{ Fibers/ml.} > 5\mu$$

*$\frac{1}{4}$ Whipple fields counted.

9/18/73 Sample #KK-020 685 Boat. Installing insulation on main propulsion turbine. Calsilite-SS used. USBM-NIOSH approved air purifying respirator worn. Breathing zone sample.
J. Cochran 246/44926

$$\frac{\frac{103}{22} \times 19024}{1830 \times 65} = \frac{89032}{118950} \quad 0.75 \text{ Fibers/ml.} > 5\mu$$

FR-CAM-002418

Date

9/18/73 Sample #KK-021 685 Boat. Ambient air 3 feet above top of main propulsion turbine while Calsilite-SS insulation was being installed. Three laggers working on turbine.

$$\frac{\frac{107}{26} \times 19024}{1830 \times 60} = \frac{78379}{109800} = 0.71 \text{ Fibers/ml.} > 5\mu$$

9/18/73 Sample #KK-022 Asbestos Barge Office. Ambient air sample taken above desk nearest to door to work area. No work being performed in the work area at time of sampling.

$$\frac{\frac{0}{24} \times 19024}{1830 \times 30} = \frac{0}{54900} = 0.0 \text{ Fibers/ml} > 5\mu$$

Asbestos Samples by K. G. Knauss, Industrial Hygienist, Electric Boat Division

12/11/73 Sample # KK-030 General air sample at gluing Table near DoAll Saw.

AC microscope

$$\frac{\frac{113}{20} \times 32100}{60 \text{ min} \times 1890 \text{ ml/min}} = \frac{5.65 \times 32100}{113400} = 1.6 \text{ fibers/ml} > 5\mu$$

Calibration of Sound Level Meter 11/2/73

Frequency - Hz	Book Value	Actual
2000	114.9 ± .3	115.2
1000	113.9 − .1	113.8
500	110.7 ± .1	110.8
250	105.3	105.3
125	97.8 − .2	97.6

Asbestos Sampling by K. G. Knauss, Industrial Hygienist, Electric Boat Division

Date	Sample No.	Location and Remarks	Concentration (Fibers/ml. >5μ)
1/4/74	KK-039	Sawing Kaylo-10 @ DOALL saw (Asbestos-Free) for blocks for surge tank. B.Z. R. St. Martin 246/23702 60 min. sample @ 1.89 lpm. $\frac{8}{25} \times 32100 (K) = 113400 ml.$ $\frac{.32 \times 32100}{113400} = \frac{1027.}{113400.} = 0.909$	.09
1/11/74	KK-040	General air at a workbench in the southwest section of Lagging Shop. 60 min. sample @ 1.89 Lpm Manual sewing performed $\frac{32}{20} \times \frac{32100}{113400} = \frac{1.6 \times 32100}{113400} = \frac{51360}{113400} =$	0.45
1/22/74	KK-042	Breathing zone while cutting 2"x1" Tees of Unibestos @ DOALL Saw. Approved Respirator Worn Operator - Debrady 246/61804 $\frac{74}{10} \times \frac{3.2100}{60 \times 1890 ml/min} = \frac{7.4 \times 32100}{113400} =$	2.09 Fibers/ml. >5μ

EB-CAM-002420

Date	Sample No.	Location and Remarks	Asbestos Concentration (Fibers/ml. ≥5μ)
		Asbestos Shop	
1/22/74	KK-043	Breathing zone while gluing at table near DOALL Bandsaw. Approved respirator worn. (Not representative of exposure) Operator - Debrady 246/61804	

$$\frac{\frac{98}{10} \times 32100}{60\text{min} \times 1.89\text{lpm}} = \frac{314580}{113400\text{ml.}} = \frac{2.77 \text{ fibers/ml}}{>5\mu}$$

1/23/74 KK-044 Asbestos Shop. General air at sewing machine near south wall.

$$\frac{\frac{4}{25} \times 32100}{60\text{min.} \times 1.89\text{Lpm.}} = \frac{.16 \times 32100}{113400\text{ml.}} = \frac{0.045 \text{ fibers/ml.}}{>5\mu}$$

1/23/74 KK-045 Asbestos Shop. Manual sewing of lagging with wire inserted asbestos thread. Breathing zone. Operator - Blackburn 246/66397

$$\frac{\frac{2}{25} \times 32100}{60\text{min} \times 1890\text{ml}} = \frac{.08 \times 32100}{113400\text{ml.}} = \frac{0.022 \text{ fibers/ml.}}{>5\mu}$$

1/24/74 KK-046 607 Boat. Installation of Unibestos on 607 Boat. Approved respirator worn. Breathing zone. Operator Pires 246/26111 (Not indicative of exposure)

$$\frac{\frac{420}{10} \times 32100}{60\text{min} \times 1890\text{ml.}} = \frac{4.2 \times 32100}{113400\text{ml.}} = \frac{11.89 \text{ fibers/ml.}}{>5\mu}$$

FR-CAM-002421

ation .)	Date	Sample No.	Location and Remarks	Asbestos Conc. (Fibers/ml >5μ)
	1/25/74	KK-047	Asbestos Shop. General air at a sewing machine in NW section of shop.	

$$\frac{\frac{88}{20} \times 32100}{150\,min \times 1890\,ml} = \frac{4.48 \times 32100}{283500} = 0.51$$

1/28/74 KK-048 Asbestos Barge. General air at cutting table nearest to saws.

$$\frac{\frac{3}{20} \times 32100}{60\,min \times 1890\,ml/min.} = \frac{0.15 \times 32100}{113400\,ml.} = 0.043$$

1/28/74 KK-049 SSN 607. Installation of Hard Covering (Unibestos) on condensate line. Breathing zone. Approved respirator worn. Not indicative of employee's exposure. Operator - Woodhall 246/18417

$$\frac{\frac{115}{12} \times 32100}{45\,min. \times 1890\,ml.} = \frac{9.58 \times 32100}{85050\,ml.} = 3.62$$

2/14/74 KK-050 Asbestos ~~Shop.~~ Installing glass fiber on a unit heater. Gluing involved. Breathing zone Operator Daigneault # 246/12563

$$\frac{\frac{22}{20} \times 32100}{60\,min. \times 1890\,ml} = \frac{1.10 \times 32100}{113400\,ml.} = 0.31$$

EB-CAM-002422

Date	Sample No.	Location and Remarks	Concentration (Fibers/ml. >5μ)
2/14/74	KK-051	General air eight inches above cutting table in SE. corner of Asbestos Lagging Shop. Intermittent cutting performed	

$$\frac{\frac{9}{20} \times 32100}{64\,\text{min} \times 1890\,\text{ml/min}} = \frac{0.45 \times 32100}{120960} = 0.078$$

2/14/74 KK-052

Asbestos shop. 10% asbestos cloth used with glass fiber blankets. S. W. corner of shop. Breathing zone. Operator – Souza 246/66697.

$$\frac{\frac{4}{20} \times 32100}{60\,\text{min} \times 1840\,\text{ml/min}} = \frac{0.20 \times 32100}{113400} = 0.057$$

2/14/74 KK-053 Asbestos Shop. General air eight inches above cutting table at S.E. corner.

$$\frac{\frac{3}{25} \times 30907}{60\,\text{min} \times 1830\,\text{ml/min}} = \frac{0.12 \times 30907}{109800} = 0.034$$

2/14/74 KK-054 Asbestos shop. Operator's exposure while working on a pad for an elbow. Breathing zone sample. Operator – Holmgren 246/55198

$$\frac{\frac{4}{25} \times 32100}{57\,\text{min} \times 1890\,\text{ml/min}} = \frac{0.16 \times 32100}{107730} = 0.048$$

EB-CAM-002423

Date	Sample No.	Location and Remarks	Concentration (Fibers/ml. >5μ)
2/14/74	KK-055	Asbestos shop. Operator's breathing zone sample while working on a pad for a turbine. Operator - Beaulieu 246/20476	

$$\frac{\frac{2}{25} \times 30907}{57\text{min} \times 1830\text{ml/min.}} = \frac{0.08\ 30907}{104310} = 0.024$$

2/14/74	KK-056	Asbestos shop. General air in N. end of shop. Glass fiber being installed on a duct and covered over with glass fiber cloth.	

$$\frac{\frac{6}{25} \times 32100}{60\text{min} \times 1890\text{ml/min}} = \frac{0.24 \times 32100}{113400} = 0.068$$

2/15/74	KK-057	Asbestos shop. General air at mud box 8 inches above hood face.	

$$\frac{\frac{7}{25} \times 30907}{60\text{min} \times 1830\text{ml/min.}} = \frac{0.08 \times 30907}{109800} = 0.023$$

2/15/74	KK-058	Asbestos shop. Operator's breathing zone while working on a Turbine pad. 10% asbestos cloth used and glass fiber. Operator - O.K. King 246/18405	

$$\frac{\frac{1}{25} \times 32100}{60\text{min} \times 1890\text{ml/min.}} = \frac{0.04 \times 32100}{113400} = 0.011$$

FR-CAM-002424

Date	Sample No.	Location and Remarks	Asbestos Concentration (fibers/ml. >5μ)	D
2/15/74	KK-059	Asbestos shop. General air at "mud" box. 8 inches above face of hood. 2 batches of "mud" mixed by 2 different laggers. Ventilation operating. Note - "mud" is asbestos free. It contains mineral wool and Portland cement.	$\frac{\frac{3}{25} \times 30907}{15 \text{ min.} \times 1830 \text{ ml/min}} = \frac{0.12 \times 30907}{27450 \text{ ml.}} = 0.135$	2
2/15/74	KK-060	Asbestos Barge. Operator's breathing zone while cutting insulated Tape for Temporary covering. Material used is 10% asbestos-containing cloth (Glossbestos) Mil. I. - 24244 Type 9B. Operator - Haviland 246/32907	$\frac{\frac{12}{25} \times 32100}{21 \text{ min.} \times 1890 \text{ ml/min.}} = \frac{0.48 \times 32100}{39690} = 0.39$	2
2/15/74	KK-061	Asbestos Barge. Ambient air 2½ feet above "mud" box.	$\frac{\frac{3}{25} \times 30907}{60 \text{ min} \times 1830 \text{ ml/min}} = \frac{0.12 \times 30907}{109800} = 0.034$	

EB-CAM-002425

Date	Sample No.	Location and Remarks	Asbestos Conc. (fibers/ml. >5μ)
2/22/74	KK-062	SSN 671. Removing Unibestos lagging from main steampipe in engineroom. Operator's breathing zone. U.S.B.M. approved, Type C supplied air respirator worn. Operator - Richardson 246/56172	$\frac{\frac{429}{5} \times 32100}{15\text{min.} \times 1890\text{ml./min.}} = \frac{85.8 \times 32100}{28350\text{ml.}} = 97.1$
2/22/74	KK-063	SSN 671. Removing lagging from a steam valve in the AMR-2. U.S.B.M. approved Type C supplied air respirator worn, Operator's breathing zone. Operator - Johnson 246/60982.	$\frac{\frac{64}{25} \times 30907}{15\text{min.} \times 1890\text{ml./min.}} = \frac{2.56 \times 30907}{28350\text{ml.}} = 2.79$

Following Samples by Elaine Briggs, Assistant Industrial Hygienist, Electric Boat Division, Groton, Conn.

EB-CAM-002426

Date	Sample No.	Location and Remarks	Asbestos Concentration (Fibers/ml. > 5μ)
2/22/74	ESB-1	SSN 671. Removing lagging from a large elbow in the diesel room. General air 1½ feet from operation.	

$$\frac{\frac{312}{14} \times 30907}{30\text{min} \times 1830\text{ml./min.}} = \frac{22.3 \times 30907}{54900} = 12.55$$

2/22/74	ESB-2	SSN 671. Removing lagging from a large elbow in the diesel room. Central air 3 feet from operation.	

$$\frac{\frac{332}{30} \times 30907}{30\text{min.} \times 1830\text{ml./min.}} = \frac{11.1 \times 30907}{54900} = 6.25$$

5-16-74	ESB-3	WET DOCK TOOL CRIB - CUTTING ASBESTOS BOARD (12 SHEETS, EACH SHEET 4×4) AND ASBESTOS CLOTH (150 ft in ~ 10 CUTS), BREATHING ZONE SAMPLE ATTACHED TO WORKER'S COLLAR	

$$\frac{\frac{317}{28} \times 30061}{\frac{2800\text{ ml.}}{\text{min}} \times 180\text{ min.}} = \frac{11.3 \times 30061}{504,000} = .675$$

K factor

counting field .17 mm × .17 mm = .0289 mm^2

Area of filter holder : mm^2

$$K = \frac{(A)\ mm^2}{.0289\ mm^2} \qquad \frac{8788 mm^2}{.029\ mm^2} \times 30,303$$

ER-CAM-002427

Date	Sample No.	Location and Remarks	Asbestos Conc. (fibers/ml > 5μ)
5/20/74	KK-081	SSN 667. General air in the upper level of the engine room.	
		$\frac{6}{20} \times 30907 = \frac{9272.1}{113400} = \frac{9272.1}{113400 \text{ ml.}}$	0.08
5/21/74	KK-082	SSN 671. General air in the control room.	
		$\frac{1}{20} \times 30907 = \frac{1545.35}{113400} = \frac{1545.35}{60 \text{ min} \times 1890 \text{ ml/min.}}$	0.01
5/22/74	KK-083	SSN 685. General air in the control room.	
		$\frac{0}{20} \times 30907 = \frac{0}{60 \text{ min} \times 1890 \text{ ml/min}}$	None Detected
5/23/74	KK-084	SSBN 616. General air in the upper level of the engine room.	
		$\frac{1}{20} \times 30907 = \frac{1545.35}{113400} = \frac{1545.35}{60 \text{ min.} \times 1890 \text{ ml/min.}}$	0.01
5/24/74	KK-085	Operator's breathing zone sample while manually sewing asbestos cloth. Papineau 246/65557	
		$\frac{19}{20} \times 30907 = \frac{2936.65}{113400} = \frac{2936.65}{113400 \text{ ml.}}$	0.26

EB-CAM-002428

Date	Sample No.	Location and Remarks	Asbestos Concentration (fibers/ml > 5μ)	Da
5/28/74	KK-086	SSN 571. General air sample collected in the upper level of the engine room. $\frac{56}{20} \times \frac{30061}{65\text{min} \times 1830\text{ml}} = \frac{84170.8}{118950} =$	0.71	6/ 90
5/28/74	KK-087 90076	SSBN 619. General air sample collected in the upper level of the engine room. $\frac{0}{20} \times \frac{30061}{60\text{min.} \times 113400\text{ml.}} =$	None Detected	6/ 90
5/31/74	KK-088 90077	SS 690. General air sample collected in the upper level of the engine room. $\frac{2}{20} \times \frac{30061}{113400} = \frac{3006.1}{113400} =$	0.03	6/ 90
5/31/74	KK-089 90078	SSN 607. General air sample collected in the upper level of the engine room. $\frac{0}{20} \times \frac{30061}{60\text{min} \times 1890\text{ml/min.}} =$	None Detected	6/ 90

Date	Sample No.	Location and Remarks	Asbestos Concentration (fibers/ml. >5 μ)
6/4/74	ESB-4 90079	Graving Dock Tool Crib, Bldg 167 Ambient air 1½ feet above roll of asbestos cloth (Johns-Manville)	

$$\frac{\frac{1}{20} \times 30061}{240\text{ min} \times 1800} = .003$$

6/5/74 KK-090 90080 Asbestos Shop at gluing table near Doall saw. Operator's breathing zone while gluing 1/2 x 1/2 bends of Unibestos. Operator was observed clapping pieces together generating unnecessary dust. McDaniel 65694.

$$\frac{\frac{873}{20} \times 30907}{60\text{ min.} \times 1890\text{ ml/min}} = 23.79$$

6/10/74 90081 KK-091 Same location as KK-090. Operator's breathing zone. Kaylo-10 used (contains glass fibers - asbestos free). F. Jacklin 63693 (operator) Approved respirator worn.

$$\frac{\frac{12}{20} \times 30061}{60\text{ min} \times 1890\text{ ml/min}} = \frac{18036.6}{113400} = 0.16$$

6/10/74 90082 KK-092 Same location as KK-090 and KK-091. Operator's breathing zone, approved respirator worn. Gluing Un.bestos bends. Operator - Daigneault - 12563

$$\frac{\frac{10}{20} \times 30061}{60\text{ min} \times 1890\text{ ml/min}} = \frac{15030.5}{113400} = 0.13$$

EB-CAM-002430

Date	Sample No.	Location and Remarks	Asbestos Conc. (Fibers/ml. >5μ)
6/11/74	KK-093	Operator's breathing zone while gluing Unibestos bends. Approved respirator worn. This is the same operation as samples KK-090, KK-091 and KK-092; however, it has been relocated at a work bench where there is local exhaust ventilation. Now located next to Rockwell saw. Operator - Papineau - 65557	
	90083	$\frac{\frac{103}{20} \times 30061}{60\text{min} \times 1890\text{ml/min}} = \frac{154814.2}{113400} = 1.37$	
7/21/74	KK-094	Operator's breathing zone while performing ripout in reactor compartment of SSN 585. Approved type-C pressure-demand, supplied-air respirator worn. A cast cutter with local exhaust ventilation provided by a vacuum cleaner having an Absolute® filter was used. An additional vacuum cleaner of the same type was used to provide local exhaust ventilation. In addition to that, two flexible hoses connected to a RadCon baghouse below the ship were used to provide a negative pressure in the compartment. Each hose exhausts approximately 400 cfm. Operator - Haviland - 32907	
	90084	$\frac{\frac{425}{20} \times 30061}{32\text{min} \times 1830\text{ml/min}} = \frac{71394825}{58560} = 12.19$	

Date	Sample No.	Location and Remarks	Asbestos Conc. (fibers/cc >5μ)
7/21/74	KK-095	Lagger's breathing zone while manually removing lagging which has been loosened with a cast cutter. Approved type-C pressure-demand, supplied-air respirator worn. Removal performed in reactor compartment of SSN 585 (Skipjack). A lagger using a cast cutter with ventilation the same as in sample KK-094 was nearby. Operator - Giles - GG623	
	90085	$\frac{\frac{382}{20} \times 30061}{36 \text{ min} \times 1830 \text{ ml/min}} = \frac{574165.1}{65880} = 8.72$	

Following samples by Christopher Eident, Dept 644 Electric Boat Division, Groton, Conn

8/23/74	CE-001	Ambient air in vicinity of band saw. Very little activity with only rubber material being cut. (Lagger's Barge)	
	90086	$\frac{\frac{1}{50} \times 30061}{100 \text{ min} \times 1890 \text{ ml/min}} = .003$	
8/23/74	CE-002	Ambient air in Laggers Barge taken on west side of room near glueing tables	
	90087	$\frac{\frac{2}{50} \times 30061}{100 \text{ min} \times 1830 \text{ ml/min}} = .007$	

Date	Sample No.	Location and Remarks	Asbestos Conc. (fibers/mL)
8/29/74	CE-003	Ambient air near Doall band saw in Asbestos shop.	

90088

$$\frac{\frac{107}{48} \times 30061}{78 \text{ min} \times 1830 \text{ mL/min}} = .47$$

8/29/74 CE-004 Operators breathing zone, main Asbestos shop. Operator working on asbestos and non-asbestos cloth. Operator: Daigneault 241/12563

90089

$$\frac{\frac{35}{100} \times 30061}{80 \times 1890 \text{ mL/m}} = .07$$

9/11/74 CE-005 Ambient air near location where bags of silica cement are emptied and mixed (taken ~~three~~ four feet from floor) on Logging Barge

90090

$$\frac{\frac{26}{50} \times 30061}{90 \text{ min} \times 1830 \text{ mL/min}} = 1.1$$

$$\left(\frac{\frac{23}{50} \times 30061}{90 \text{ min} \times 1830 \text{ mL/m}} = .93 \text{ fiberglass fibers/mL} \right)$$

9/11/74 CE-006 Logging operation on SSN571 with Owens Corning Fiberglass/Asbestos free. Keyed in engine room. Operator Belleville Badge no. 36410 (Breathing zone sample)

90091

$$\frac{\frac{40}{50} \times 30061}{60 \text{ min} \times 1890 \text{ mL/m}} = 2.1$$

$$\left(\frac{\frac{17}{50} \times 30061}{60 \text{ min} \times 1890 \text{ mL/m}} = .90 \text{ fiberglass fibers/mL} \right)$$

ER-CAM-002433

Date	Sample No.	Location and Remarks	Asbestos Con. (fibers/ml 7.5μ)
9/19/74	CE-007	Ambient air in the upper engine room of SSN 619 in vicinity of small bits of logging with fiberglass cloth, welding, and chipping	
	90092	$\frac{\frac{1}{50} \times 3006l}{65 \text{ min} \times 1830 \text{ ml/min}} = .005$	
		$\left(\frac{\frac{3}{50} \times 3006l}{65 \times 1830 \text{ ml/min}} = .015 \text{ fiberglass fibers/ml}\right)$	
9/19/74	CE-007	Ambient air in lower engine room of the SSN 619 while logging done on the level just above it	
	90093	$\frac{\frac{0}{50} \times 3006l}{60 \text{ min} \times 1890 \text{ ml/min}} = \text{non-detectable}$	
		$\left(\frac{\frac{1}{50} \times 3006l}{60 \times 1890 \text{ ml/min}} = .005 \text{ fiberglass fibers per ml}\right)$	
9/27/74	CE-007	Ambient air in middle level engine room of the SSN 690.	
	90094	$\frac{\frac{4}{60} \times 3006l}{63 \times 1890 \text{ ml/min}} = .021$	
		$\left(\frac{\frac{3}{60} \times 3006l}{63 \times 1890} = .015 \text{ fiberglass fibers/ml}\right)$	
9/27/74	CE-008	Ambient air in lowest level of engine room of SSN 690 in close proximity to a welding operation.	
	90095	$\frac{\frac{9}{50} \times 3006l}{67 \text{ min} \times 1890} = .043$	
		$\left(\frac{\frac{8}{50} \times 3006l}{67 \times 1890} = .037 \text{ fiberglass fibers/ml}\right)$	

ER-CAM-002434

Date	Sample No.	Location and Remarks	Asbestos Conc. (fibers/ml >.5 μ)
10/4/74	CE-009	Ambient air, lower engine room of the SSN 667 (Gengel)	
	90096	$\frac{\frac{2}{50} \times 30061}{60\ \text{min} \times 1890\ \text{ml/min}} = .01$	
		$\left(\frac{\frac{5}{50} \times 30061}{60\ \text{min} \times 1890\ \text{ml/min}} = .027\ \text{fiberglass fibers/ml}\right)$	
10/4/74	CE-010	Ambient air of upper engine room (aft) near a welding operation and a fiberglass cloth lagging operation in the SSN 667	
	90097	$\frac{\frac{1}{50} \times 30061}{60\ \text{min} \times 1830\ \text{ml/min}} = .005$	
		$\left(\frac{\frac{4}{50} \times 30061}{60\ \text{min} \times 1830\ \text{ml/min}} = .02\ \text{fiberglass fibers/ml}\right)$	
10/28/74	CE-011	Ambient air in Asbestos Barge #6 near band saw.	
	90098	$\frac{\frac{2}{50} \times 30061}{100 \times 1890\ \text{ml/min}} = .06$	
		$\left(\frac{\frac{2}{50} \times 30061}{100\ \text{min} \times 1890\ \text{ml/min}} = .06\ \text{fiberglass fibers per ml}\right)$	
10/28/74	CE-012	Ambient Air in the Asbestos Barge #6 ~~office~~ near asbestos storage rack, east wall.	
	90099	$\frac{\frac{6}{50} \times 30061}{100 \times 1830} = .19$	
		$\left(\frac{\frac{0\ \text{fibers}}{50\ \text{fields}} \times 30061}{100\ \text{min} \times 1830\ \text{ml/min}} = \text{Non-detectable}\right)$ ~~fiberglass fibers per ml~~	

FB-CAM:002435

>.5 μ) Date	Sample No.	Location and Remarks	Asbestos Conc (fibers/ml > 5μ)
11/4/74	CE-013	Ambient air, engine room of SSN 585 (ship jack)	
90100		$\frac{\frac{4}{50}\text{ fields} \times 30061}{100\text{ min} \times 1890\text{ ml/min}}$	= .012
		$\left(\frac{\frac{7}{50} \times 30061}{100 \times 1890} = .022\right.$ fiberglass fibers/ml$\left.\right)$	
11/4/74	CE-014	Ambient air, lower engineering room of SSN 585	
90101		$\frac{\frac{3\text{ fibers}}{70\text{ fields}} \times 30061}{100\text{ min} \times 1830\text{ ml/min}}$	= .007
		$\left(\frac{\frac{4}{50} \times 30061}{100 \times 1830} = .01\right.$ fiberglass fibers/ml$\left.\right)$	
1/31/75	CE-015	Ambient air in the engine room of the SSN 690, middle level starboard side	
90102		$\frac{\frac{4}{50} \times 30061}{100 \times 1890}$	= .013
		$\left(\frac{\frac{5}{50} \times 30061}{100 \times 1890} = .016\right.$ fiberglass fibers/ml$\left.\right)$	
1/31/75	CE-016	General air in the engine room of the 690, middle level, port side.	
90103		$\frac{\frac{4}{50} \times 30061}{100\text{ min} \times 1830}$	= .013
		$\left(\frac{\frac{1}{50} \times 30061}{100\text{ min} \times 1830\text{ ml/min}} = .003\right.$ fiberglass fibers/ml$\left.\right)$	

FB-CAM-002436

Date	Sample No.	Location and Remarks	Asbestos Conc. (fibers/mL > 5 μ)
2/6/75	CE-017	Asbestos Shop, ambient air directly above cutting area on the Do-All saw, while cutting Kaylo-10	
	90104	$\frac{\frac{\text{fibers}}{50} \times 30061}{77 \times 1830 \text{ ml/min}} = .016$	
		$\left(\frac{\frac{\text{fibers}}{50} \times 30061}{77 \times 1830} = .43 \text{ fiberglass fibers/ml}\right)$	
2/6/75	CE-018	Operators breathing Zone at Do-All saw in Asbestos Shop while cutting Kaylo-10. (Saw was vacuumed down prior to starting, and ventilation system cleaned.) Operator wore respirator.	
	90105	$\frac{34 \text{ fibers}}{50 \text{ fields}} \times 30061 = .18$ fiberglass fibers/ml 60 min × 1890 ml/min	
2/7/75	CE-019	Ambient air in the upper engine room of the SSN 690 adjacent to a small lagging operation with Kaylo.	
	90106	$\frac{\frac{18 \text{ fibers}}{50 \text{ fields}} \times 30061}{80 \text{ min} \times 1830 \text{ ml/min}} = .074$	
2/7/75	CE-020	Ambient air in upper engine room of the SSN 690 on the port side away from the lagging operation	
	90107	$\frac{\frac{5 \text{ fibers}}{50 \text{ fields}} \times 30061}{90 \text{ min} \times 1890 \text{ ml/min}} = .017$	

Date	Sample No.	Location and Remarks	Asbestos Conc (fibers/ml >7.5 μ)
~~3/11/75~~ 3/11/75	CE-021	SSN 585 Ambient air in the upper and aft section of the engine room	
90108			

$$\frac{\frac{34^*}{50} \times 30061}{130 \times 1850 \text{ ml/min}} = .08$$

$$\frac{\frac{14}{52} \times 30061}{130 \times 1850 \text{ ml/min}} = .035 \text{ fiberglass fibers/ml}$$

3/11/75	CE-022	SSN 585 Ambient air in the lower engine room, aft area
90109		

$$\frac{\frac{51}{50} \times 30061}{130 \times 1670 \text{ ml/min}} = .14$$

$$\frac{\frac{32}{50} \times 30061}{130 \times 1670} = .089 \text{ fiberglass fibers}$$

3/21/75	CE-023	Bldg 232, the Sonar Sphere. Ambient air, inside, near the southwest pole on which the fabric is hanging
90110		

$$\frac{\frac{9}{50} \times 30061}{75 \times 2,050} = .035$$

3/21/75	CE-024	Bldg 232, Sonar Sphere. Ambient air near north west pole on which the fabric is hanging
90111		

$$\frac{\frac{2}{50} \times 30061}{75 \times 1,480} = .008$$

* Note: first equation is for all fibers tallied, whereas second equation is for only the fibers believed to be fiber glass.

FB-CAM-002438

Date	Sample No.	Location and Remarks	Asbestos Conc (fiber/mL 7.5 μ)
3/21/75	CE-025	Breathing zone sample on employee in Sonar Sphere Bldg	
	90112	$\frac{\frac{10 \text{ fibers}}{50 \text{ fields}} \times 300 \text{ (area factor)}}{75 \text{ min} \times 1.64 \text{ L/min}}$	= .05
3/21/75	CE-026	Breathing zone sample on another employee in the Sonar Sphere Bldg (Bldg 232)	
	90113	$\frac{\frac{12}{50} \times 300}{75 \times 1.730}$	= .056
4/16/75	CE-027	Ambient air Samples in the @ SSN 585 engine room near logging operation	
	90114	$\frac{\frac{31 \text{ fibers}}{50 \text{ fields}} \times 300 \text{ (ratio factor)}}{181 \text{ min} \times 2.03 \text{ liters/min}}$	= .05 fiber/cc ②
		Dust load = 2.2 mg/m³	
4/16/75	CE-028	Ambient air sample in SSN 585 engine room about 10 feet from logging operation	
	90115	$\frac{\frac{12 \text{ fibers}}{50 \text{ fields}} \times 300}{182 \text{ min} \times 1.94 \text{ lpm}}$	= .02 fiber/cc ②
		Dust load = 1.69 mg/m³	

Date	Sample No	Location, Remarks	Asbestos Conc (fibers > 5μ/ml)
6-13-75	EB-004	Ambient Air - Reactor Compt. 692 boat	
90116	(1126)	placed near area where asbestos cloth used for cover up by welders	

$$\frac{20 \text{ fibers}}{20 \text{ Fields}} \times \frac{30303}{180 \text{ min} \times \frac{2030 \text{ ml}}{\text{min}}} = .08$$

Fiberglass fibers = .016

6-13-75	EB-005	Ambient Air - Engine Rm 692 boat	
90117	(1127)	Near area where asbestos cloth used by welder for cover up	

$$\frac{\frac{34}{20}}{180 \text{ min} \times \frac{1640 \text{ ml}}{\text{min}}} \times 30303 = .17$$

Fiberglass = .025

6-13-75	EB-006 (FF)	Ambient Air - Reactor Compt. 694 boat	
90118	(1128)	No asbestos in area	Non-retable Sample - closed filter

$$\frac{\frac{5}{20}}{180 \text{ min} \times \frac{2180 \text{ ml}}{\text{min}}} \times 30303 = .03$$

Fiberglass = 0

6-13-75	EB-007	Ambient Air - Engine Rm 694 boat	
90119	(1129)	No visible asbestos cloth in area	

None detected

Date	Sample No.	LOCATION - Remarks	Asbestos Conc (Fibers > 5μ/ml)
7-7-75	EB-008	Chem Lab. BZ on Leo Gladue, chopping up asbestos cloth/fiberglass insulation material. Uses paper cutter under exhaust hood.	
90120			

$$\frac{\frac{6}{20} \times 29,381}{45 \text{ min} \times 1860 \frac{\text{ml}}{\text{min}}} = 0.1 \text{ fibers/ml}$$

7-7-75	EB-009	Chem Lab. General Air ~ 7 feet from hood, 3 ft from blender. Sample during asbestos chopping.	
90121			

$$\frac{\frac{4}{20} \times 28,710}{55 \text{ min} \times 1830 \frac{\text{ml}}{\text{min}}} = .05 \text{ fibers/ml}$$

7-7-75	EB-010	Chem Lab. BZ on Gladue, chopping up Asbestos/fiberglass as in EB-008.	
90122			

$$\frac{\frac{41}{20} \times 29,381}{43 \text{ min} \times 1860 \frac{\text{ml}}{\text{min}}} = .76 \text{ fibers/ml}$$

7-7-75	EB-011	Chem Lab. General Air, Pump set on left front edge of hood while asbestos was being chopped up	
90123			

$$\frac{\frac{33}{20} \times 28,710}{41 \text{ min} \times 1830 \frac{\text{ml}}{\text{min}}} = .63 \text{ fibers/ml}$$

>5m/ml air
ing up
rial.

7-30-75 EB-012 LL Eng. Rm, 690, Near
90124 After escape trunk

$$\frac{\frac{17}{20} \times 30303}{60 \text{ min} \times \frac{1890 \text{ ml}}{\text{min}}} = .23 \text{ fibers/ml}$$

7-30-75 EB-013 ML COC 690, Crews Quarter
90125 large piece of cloth board in area

chopping

$$\frac{\frac{5}{20} \times 28.710}{60 \text{ min} \times \frac{1740}{\text{min}}} = .07 \text{ fibers/ml}$$

9-2-75 D.A-001 LL TORPEDO ROOM 692
90126 ASBESTOS BOARD IN THE AREA (FRAME 34)

$$\frac{\frac{29}{20} \times 29386}{103 \text{ min} \times 1100 \text{ ml/min}} = .38 \text{ fibers/ml}$$

9-2-75 D.A-002 UL COC FRAME 44 692
90127 LARGE SHEETS OF ASBESTOS CLOTH COVERING MACHINERY IN THE AREA

$$\frac{\frac{25}{20} \times 28221}{90 \text{ min} \times 1500 \text{ ml/min}} = .26 \text{ fibers/ml}$$

9-5-75 D.A-003 UL FRAME 77, NEAR VALVE STATION 692
90126 ASBESTOS CLOTH COVERING TUBES AND VALVES, VACUUMING BEING DONE IN THE AREA

$$\frac{\frac{23}{20} \times 30303}{65 \text{ min} \times 2030 \text{ ml/min}} = .32 \text{ fibers/ml}$$

38★ SAMPLES D.A-001 - D.A.-004 TAKEN IN AREAS TO SHOW MAXIMUM ASBESTOS EXPOSURES

9-5-75 D.A-004 ML FRAME 85 692
90129
ASBESTOS COVERING PIPES IN THE AREA,

$$\frac{\frac{24}{20} \times 30303}{75 \text{ min} \times 1940 \text{ ml/min}} = .35 \text{ fibers/ml}$$

9-10-75 D.A.-005 QUONSET, BUILDING 488
90130
35' BY 100' ASBESTOS CURTAIN
SAMPLE TAKEN 5 FEET FROM ASBESTOS DOOR

$$\frac{\frac{110}{30} \times 30303}{129 \text{ min} \times 1740 \text{ ml/min}} = .50 \text{ fibers/cc}$$

9-10-75 D.A-006 QUONSET, BUILDING 488
90131
SAMPLE TAKEN 30FT FROM ASBESTOS CURTAIN

$$\frac{\frac{21}{30} \times 28221}{136 \text{ min} \times 1890 \text{ ml/min}} = .30 \text{ fibers/cc}$$

9-22-75 D.A-007 690 ML. REACTOR TUNNEL
90132
LARGE PIECE OF ASBESTOR CLOTH HANGING NEAR DOORWAY

$$\frac{\frac{9}{20} \times 30303}{175 \text{ min} \times 1940 \text{ ml/min}} = .04 \text{ fibers/ml}$$

10-23-75 EB-014 386, West Milton, Shield tank
90133
large piece of cloth hanging on wall for protection of bulkhead from grinding particles

$$\frac{\frac{56}{10} \times 28,710}{1700 \text{ ml/min} \times 183 \text{ min}} = .52 \text{ fibers/cc}$$

10-15-75 O.A-008 UL FRAME 40 585 BOAT

90134 SMALL PIECE OF ASBESTOS CLOTH COVERING WIRES

$$\frac{\frac{4}{20} \times 29221}{75 \times 1940 \text{ l/min}} = .04 \text{ fibers/cc}$$

10-15-75 O.A-009 LL FRAME 35 585 BOAT

90135 CREWS QUARTERS, [redacted]

$$\frac{\frac{7}{20} \times 30303}{20 \times 1930} = .09 \text{ fibers/cc}$$

12-2-75 O.A-010 UL ENGINE ROOM, FRAME 131 626 BOAT

90136 BEFORE RIP OUT STARTED, ~~WET~~ SOME PADS HAD BEEN REMOVED AN HOUR OR TWO BEFORE MONITORING IN

$$\frac{\frac{3}{20} \times 30303}{45 \times 2030} = .05 \text{ fibers/cc}$$

12-2-75 O.A-011 UL ENGINE ROOM, FRAME 131 626 BOAT

90137 DURING RIP-OUT ON VERGASON (LAGER)

$$\frac{\frac{465}{5} \times 30303}{40 \times 2430} = 29.0 \text{ fibers/cc}$$

12-2-75 O.A.-012 UL ENGINE ROOM, FRAME 131 ~~626~~ BOAT

90138 DURING RIP-OUT, ON SWEET (LAGER)

$$\frac{\frac{777}{5} \times 29978}{40 \times 2500} = 46.59 \text{ fibers/cc}$$

12-2-75 D.A.-013 4L ENGINE ROOM, FRAME 127 626 BOAT
90139 AREA SAMPLE APPROX. 10 FEET FROM RIP-OUT OPERATION

$$\frac{\frac{240}{10} \times 30303}{75 \times 2030} = 4.8 \text{ fibers/cc}$$

12-2-75 D.A.-014 4L ENGINE ROOM, FRAME 125 626 BOAT
90140 AREA SAMPLE OUTSIDE MANUEVERING DOOR, APPROX. 20 FEET FROM RIP-OUT

$$\frac{\frac{122}{20} \times 28221}{75 \times 1620} = 1.4 \text{ fibers/cc}$$

12-2-75 D.A.-015 4L ENGINE ROOM, 626 BOAT
90141 CN CLEANER (BELILACQUA) WHILE HE WAS VACUUMMING AFTER RIP OUT

$$\frac{\frac{108}{15} \times 29997}{60 \times 2130} = 1.69 \text{ fibers/cc}$$

12-2-75 D.A.-016 4L ENGINE ROOM, FRAME 127 626 BOAT
90142 AREA SAMPLE AFTER RIP-OUT WHEN CLEANERS ARE WORKING

$$\frac{\frac{69}{15} \times 30303}{55 \times 2030} = 1.2 \text{ fibers/cc}$$

12-2-75 D.A.-017 4L ENGINE ROOM, FRAME 126 626 BOAT
90143 AREA SAMPLE 6 FEET FROM MANUEVERING DOOR AND 15 FEET FROM MAIN CLEANING AREA, CLEANING WAS FINISHED MIDWAY IN THE SAMPLE

$$\frac{\frac{23}{25} \times 30303}{35 \times 2030} = .39 \text{ fibers/cc}$$

12-2-75 D.A.-018 UL ENGINE ROOM, FRAME 131 626 BOAT

ATION 90144 AREA SAMPLED STARTED 5 MINUTES [redacted] AFTER CLEANING WAS FINISHED

$$\frac{\frac{15}{20} \times 29386}{40 \times 1940} = .28 \text{ Fibers/cc}$$

OX. 12-4-75 FF-001 ENGINE ROOM, BACKGROUND 626 BOAT
90145 SAMPLE AFTER CLEANERS FINISHED

$$\frac{\frac{25}{23} \times 30303}{20 \times 1830} = .91 \text{ fiber/cc}$$

12-4-75 FF-002 ENGINE ROOM, BACKGROUND WHILE
90146 RIP-OUT IN PROGRESS 626 BOAT

$$\frac{\frac{543}{17} \times 30303}{54 \times 1940} = 9.2 \text{ fiber/cc}$$

12-4-75 FF-003 MANOUVERING ROOM ENTRANCE,
90147 ENGINE RM. WHILE RIP-OUT IN PROGRESS.
626 BOAT

$$\frac{\frac{519}{16} \times 29710}{54 \times 2030} = 8.4 \text{ fiber/cc}$$

12-4-75 FF-004 ENGINE ROOM - SAMPLE TAKEN
90148 ON LAGGER (K. BURT 67740). MAN
WORKING ON PIPE BELOW [redacted] 626 BOAT

$$\frac{\frac{130}{15} \times 29978}{22 \times 2130} = 2.3 \text{ fiber/cc}$$

12.4.75 FF-005 ENGINE ROOM. SAMPLE TAKEN ON
90149 LAGGER WHILE RIPOUT IN PROGRESS. MAN WORKING ON PIPE BELOW. [redacted]. ENGINE ROOM -626 BOAT. (L. JOHNSON 60981)

$$\frac{\frac{106}{23} \times 28221}{21 \times 2150} = 2.8 \text{ fiber/cc}$$

12.4.75 FF-006 ENGINE ROOM. SAMPLE TAKEN
90150 ON CLEANER (J. PREBLE 64503) WHILE CLEANING IN PROGRESS. 626 BOAT

$$\frac{\frac{37}{12} \times 29386}{25 \times 2130} = 1.7 \text{ fiber/cc}$$

12.4.75 FF-007 ENGINE ROOM. BACKGROUND WHILE
90151 CLEANING IN PROGRESS. 626 BOAT

$$\frac{\frac{51}{21} \times 30303}{20 \times 1930} = 2.0 \text{ fiber/cc}$$

12-3-75 BB-001 Engine room. Sample taken on Lagger
90152 (J. Severens) during ripout 626 Boat

$$\frac{\frac{484}{30} \times 30303}{22 \times 1990} = 11.2 \text{ fibers/cc}$$

12-3-75 BB-002 Engine room. Sample taken on Lagger
90153 (K. Bunt) during ripout 626 Boat

$$\frac{\frac{414}{30} \times 28221}{22 \times 2130} = 8.3 \text{ fibers/cc}$$

12-3-75 BB-003 Engine Room. Sample taken 10' from
90154 ~~ripout~~ work Area during Ripout operation. 626 Boat

$$\frac{\frac{587}{30} \times 30303}{38 \times 1630} = 9.5 \text{ fibers/cc}$$

12-3-75 BB-004 Engine room. Inside door of maneuvering compartment 20' from work during ripout 626 Boat
90155

$$\frac{\frac{360}{20} \times 29978}{52 \times 1790} = 5.6 \text{ fibers/cc}$$

12-3-75 BB-005 Engine Room. On worker during cleaning operations (J. Preble) 626 Boat
90156

$$\frac{\frac{115}{30} \times 29386}{43 \times 1990} = 1.2 \text{ fibers/cc}$$

12-3-75 BB-006 Engine Room. Sample taken during cleaning operation - port side 10' from work 626 Boat
90157

$$\frac{\frac{18}{50} \times 30303}{20 \times 1640} = .33 \text{ fibers/cc}$$

12-3-75 BB-007 Engine Room Sample taken 10' from working Area during cleaning operations mid-isle 626 Boat
90158

$$\frac{\frac{29}{50} \times 30303}{24 \times 2500} = .29 \text{ fibers/cc}$$

~~2-5~~?

ER-CAM-002448

Quarterly samples D.A. -019 - 022

12-5-75 D.A. -019 Ambient Air Sample - Main Yard by Safety Classroom
90159

$$\frac{\frac{3}{20} \times 30303}{285 \times .2130} = .007 \text{ fiber/cc}$$

12-5-75 D.A. -020 Ambient Air Sample - South Yard by Sonar Sphere Room
90160

$$\frac{\frac{1}{30} \times 29978}{295 \times 1550} = .002 \text{ fiber/cc}$$

12-5-75 D.A. -021 Ambient Air Sample - Near Shipping Carpenters Building 198
90161

$$\frac{\frac{2}{30} \times 30303}{270 \times 1790} = .004 \text{ fiber/cc}$$

12-5-75 D.A. -022 Ambient Air Sample - North Yard, Fire Pump Station
90162

$$\frac{\frac{3}{30} \times 29326}{315 \times 1990} = .005 \text{ fiber/cc}$$

EB-CAM-002449

12-5-75 EB-014 UL Engine Room 626 Boat
90163
B2 sample on R. Burt (Lagger)
Working Port Side ~ Fr 127
Rip-out at chest level

$$\frac{\frac{187}{10} \times 29386}{14 \times 2130} = 13.5 \text{ fibers/cc}$$

12-5-75 EB-015 UL Engine Room 626 Boat
90164
B2 sample on L. Langois (Lagger)
Working starboard side ~ Fr 127 -
Ripout below level of chest

$$\frac{\frac{157}{10} \times 28710}{14 \times 1990} = 16.2 \text{ fibers/cc}$$

12-5-75 EB-016 UL Engine Room 626 Boat
90165
Ambient sample 8'-10' from laggers and 8 ft from manuver. room on main Aisle

$$\frac{\frac{133}{10} \times 29707}{49 \times 1940} = 4.1 \text{ fibers/cc}$$

12-5-75 EB-017 UL ENG. Room 626 BOAT
90166
Ambient sample set in manuvering Room during Ripout

$$\frac{\frac{53}{10} \times 28221}{48 \times 2030} = 1.5 \text{ fibers/cc}$$

EB_CAM_002450

12-5-75 EB-018
90167
UL ENG ROOM 626 BOAT
Ambient sample on other side of compartment hatch ~ Fr 124
Hatch open - during ripout

$$\frac{\frac{53}{TC} \times 30303}{47 \times 1790} = 1.9 \text{ fibers/cc}$$

12-5-75 EB-019
90168
UL ENG Room 626 Boat
Ambient sample on other side of compartment hatch - Herculite used to cover hatch - during ripout

$$\frac{\frac{85}{16} \times 30303}{55 \times 2130} = 2.2 \text{ fibers/cc}$$

12-5-75 EB-020
90169
UL ENG Room 626 Boat
BZ sample on J. Preble - cleaner D251

$$\frac{\frac{49}{10} \times 30303}{23 \times 1990} = 3.2 \text{ fibers/cc}$$

12-5-75 EB-021
90170
UL ENG ROOM 626 BOAT
Ambient sample during cleaning in maneuvering center

$$\frac{\frac{40}{10} \times 29978}{45 \times 2030} = 1.4 \text{ fibers/cc}$$

12-5-75 EB-022 LL ENG ROOM 626 BOAT
90171
Ambient sample taken at conclusion of clean up operations - Set on counter on main aisle

$$\frac{\frac{16}{20} \times 30303}{34 \times 1940} = .37 \text{ fibers/cc}$$

12-5-75 EB 023 Bldg 129 Sheetmetal shop - manufacture of strip heaters - cutting asbestos cloth
90172
DZ on J. Buffington 22164

$$\frac{\frac{11}{10} \times 30303}{50 \times 1890} = 3.5 \text{ fibers/cc}$$

12-5-75 EB-024 Bldg 129 Sheetmetal shop
90173
cutting asbestos cloth for strip heaters - Ambient sample ~ 4' from cutting

$$\frac{\frac{9}{10} \times 28221}{45 \times 2130} = .09 \text{ fibers/cc}$$

12-8-75 EB-025 LL REACTOR Cmpt 626 BOAT
90174
Ambient sample set 5' from lagging operation

$$\frac{\frac{378}{20} \times 28710}{1940 \times 60} = 4.7 \text{ fibers/cc}$$

EB CAM 002452

12-8-75 EB-026 UL ENG Room - 626 BOAT
90175 Lagging ~ 8' away from the maneuvering center (Fr 125) (in maneuvering center)

$$\frac{\frac{145}{20} \times 29386}{2130 \times 40} = 2.5 \text{ fibers/cc}$$

12-8-75 EB-027 UL ENG Room - 626 BOAT
90176 BZ on G Clarke - starboard side ripout at fr 125 (lagger)

$$\frac{\frac{159}{20} \times 29707}{1990 \times 20} = 5.9 \text{ fibers/cc}$$

12-8-75 EB-028 UL ENG Room - 626 BOAT
90177 Ambient sample in Engine Room 4' from manuver center - 3' from in progress ripout - Fr 126

$$\frac{\frac{870}{5} \times 28221}{2030 \times 60} = 17.1 \text{ fibers/cc}$$

12-8-75 EB-029 UL ENG Room - 626 BOAT
90178 Sample in manuvering center during ripout operations - 4' from ripout

$$\frac{\frac{318}{4} \times 30303}{1790 \times 60} = 22.4 \text{ fibers/cc}$$

12-8-75 EB-030 UL ENG Room, 626 BOAT
90179 BZ on G Clark, cleaner

$$\frac{\frac{40}{20} \times 30303}{1990 \times 20} = 1.5 \text{ fibers/cc}$$

12-8-75 EB-031 626-UL Reactor Compt. Ambient
90180 Sample after cleaners had finished

$$\frac{\frac{24}{20} \times 29978}{1940 \times 65} = .28 \text{ fibers/cc}$$

12-8-75 EB-032 UL. Eng. Room, Fr. 12.7 - Ambient
90181 level, clean up, 626 boat

$$\frac{\frac{18}{20} \times 30303}{2130 \times 39} = .33 \text{ fibers/cc}$$

12-9-75 BB-008 Engine Room. Sample taken on (high pipes)
90182 Laggen (L-Langors Jr.) durning ripout 626 Boat

$$\frac{\frac{64}{20} \times 38221}{15 \times 2500} = 2.4 \text{ fibers/cc}$$

12-9-75 BB-009 Engine Room. Sample taken on
90183 Laggen during ripout (Clark Logan) 626 Boat
(working on low pipes) 626 Boat

$$\frac{\frac{433}{10} \times 30303}{16 \times 2430} = 33.7 \text{ fibers/cc}$$

12-9-75 BB-010 Engine Room. Sample taken
90184 10' from work during ripout 626 Boat

$$\frac{\frac{22}{30} \times 29386}{40 \times 1700} = .31 \text{ fibers/cc}$$

12-9-75 BB-010 Engine Room. Sample taken inside
90185 Manuvering room Door during ripout 626 Boat
(work 5' from door)

$$\frac{\frac{161}{30} \times 29707}{30 \times 1940} = 2.74 \text{ fibers/cc}$$

EB-CAM-002454

12-9-75 BB-012 Engine Room. Sample taken 10' from
90186 work area during Ripout operations 626 Boat

$$\frac{\frac{22}{30} \times 29386}{40 \times 1850} = .31 \text{ fibers/cc}$$

12-9-75 BB-013 AMR-2 Sample taken during end
90187 ~~Clean~~ ripout + beginning of cleaning operations 626 Boat

$$\frac{\frac{6}{25} \times 30303}{45 \times 1990} = .1 \text{ fibers/cc}$$

12-9-75 BB-014 AMR-2 Sample taken during
90188 Ripout operations 626 Boat

$$\frac{\frac{40}{20} \times 28710}{24 \times 1940} = 1.2 \text{ fibers/cc}$$

12-9-75 BB-015 Engine Room. Sample taken on
90189 cleaner (M. Bevilacqua) 626 Boat

$$\frac{\frac{53}{30} \times 30303}{58 \times 1890} = .5 \text{ fibers/cc}$$

12-9-75 BB-016 Engine Room. Sample taken on
90190 cleaner (F. Bood) 626 Boat

$$\frac{\frac{184}{30} \times 30303}{57 \times 2260} = 1.5 \text{ fibers/cc}$$

12-9-75 BB-017 Engine Room Background - Sample
90191 taken after cleaning operations (M.O is/e) 626 Boat

$$\frac{\frac{17}{30} \times 29978}{30 \times 2430} = .18 \text{ fibers/cc}$$

12/9/75 BB-016 Engine Room Sample taken (Backgrou
90192 after cleaning operation - Outside MANUFACTURING
room door 626 BOAT

$$\frac{\frac{17}{30} \times 28221}{30 \times 2550} = .22 \text{ fibers/cc}$$

FB-CAM-002456

12/10/75 FF-008 Engine Room 626 Boat While
90193 Rip-Out in Progress fr 131

$$\frac{\frac{124}{22} \times 28710}{55 \times 2030} = 1.4 \text{ fibers/cc}$$

12/10/75 FF-009 Engine Room 626 Boat Sample
90194 taken on logger P. Vergazon (57133)
while rip-out in progress

$$\frac{\frac{528}{10} \times 29386}{22 \times 1990} = 3.54 \text{ fibers/cc}$$

12/10/75 FF-010 Engine Room 626 Boat Sample
90195 taken on logger C. Bears (66625)
while rip-out in progress

$$\frac{\frac{75}{21} \times 29107}{24 \times 2130} = 2.0 \text{ fibers/cc}$$

12/10/75 FF-011 Engine Room 626 Boat Measuring
90196 Room Entrance Rip out going
on in the immediate area

$$\frac{\frac{575}{25} \times 25221}{55 \times 1940} = 7.6 \text{ fibers/cc}$$

12/10/75 FF-012 Engine Room 626 Boat Taken
90197 while cleaning after rip-out
completed fr 129

$$\frac{\frac{22}{21} \times 30303}{20 \times 1990} = .79 \text{ fibers/cc}$$

12/10/75 FF-013 Engine Room 626 Boat Background
90198 Wiped Cleaning Complete Fr. 129

$$\frac{\frac{34}{2.2} \times 29970}{29 \times 2130} = .75 \text{ fibers/cc}$$

12-11-75 EB-033 ER, UL, 626 Boat
90199 Ambient sample after cleaning complete
Fr. 127, main walkway

$$\frac{\frac{46}{20} \times 30303}{40 \times 2130} = .82 \text{ fibers/cc}$$

12-11-75 EB-034 UL ER 626 Boat
90200 Fr 139, Port side reduction gear
Ambient sample after cleanup complete

$$\frac{\frac{70}{20} \times 30303}{41 \times 1990} = 1.3 \text{ fibers/cc}$$

12-11-75 RHS-001
90201 585 Eng Rm Port side Aft
Pump # 3048 @ 2.0 lpm = 1.79 lpm
#1 Filter K = 29,386
Start 0717 Stop 0900 = 103 mm

$$\frac{\frac{20}{30} \times 29,386}{1790 \times 103} = 0.11 \text{ fibers/cc}$$

nd

12-11-75 RHS 002 — 90202

SBS ENG RM EngRm Main Passage
Pump #3492 @ 2 alpm = 1.66 lpm
#3 FILTER K = 29,707
START 0723 STOP 0857 = 94 min

$$\frac{\frac{28}{30} \times 29,707}{1640 \times 94} = 0.18 \text{ fibers/cc.}$$

12-12-75 RHS 003 — 90203

SBS ENG RM STB FR 95
Pump C-06-0144 @ .6 = 1.99 lpm
#5 FILTER K = 30303
START 0850 STOP 0957 = 67 min

$$\frac{\frac{15}{46} \times 30303}{1990 \times 67} = 0.07 \text{ fibers/cc}$$

12-12-75 RHS 004 — 90204

SBS ENG RM main PASSAGE
Pump C-06-0137 @ 6 = 2.13 lpm
#3 FILTER K = 29707
START 0855 STOP 0957 = 60 min

$$\frac{\frac{8}{50} \times 29707}{2130 \times 60} = 0.04 \text{ fibers/cc}$$

13 min

12-17-75 BIS-019 — 90205

North Yard Salvage Area Sample taken 25 ft in rubbish work Area (facing South)

$$\frac{\frac{28}{30} \times 2486}{125 \times 2130} = .1 \text{ fibers/cc}$$

12-17-75 BIS-020 — 90206

North Yard Salvage Area Sample taken on Dock facing South toward River

$$\frac{\frac{8}{30} \times 29707}{130 \times 1990} = .03 \text{ fibers/cc}$$

EB-CAM-002460

12-12-75 D.A.-023 UL frame 131 626 BOAT
90207 10 feet from man ripping out

$$\frac{\frac{324}{20} \times 28710}{32\text{ min} \times 2030\text{ ml/min}} = 7.16 \text{ fibers/cc}$$

12-12-75 D.A.-024 UL Engine Room, frame 132 626 Boat
90208 Personal sample on Johnson (logger) while he was bagging asbestos 7 feet from the rain rip-out operation

$$\frac{\frac{326}{20} \times 29707}{25 \times 1990} = 9.73 \text{ fibers/cc}$$

12-12-75 D.A.-025 UL Engine Room, outside maneuvering door 626
90209

$$\frac{\frac{373}{20} \times 28221}{40 \times 1940} = 6.78 \text{ fibers/cc}$$

12-12-75 D.A.-026 UL, frame 118 626 Boat
90210 area sample just outside engine room compartment on the hatch door

$$\frac{\frac{45}{20} \times 30303}{45\text{ min} \times 2030\text{ ml/min}} = .75 \text{ fibers/cc}$$

12-12-75 D.A.-027 UL, frame 133 626 Boat
90211 area sample 10 feet away from major rip-out area

$$\frac{\frac{139}{20} \times 30303}{30\text{ min} \times 1940\text{ ml/min}} = 3.62 \text{ fibers/cc}$$

12-12-75 D.A.-028 UL Engine Room 626 Boat
90212 Personal sample on ~~Bebe~~ Bevilacqua (cleaner) while he was vacuuming after rip-out

$$\frac{\frac{100}{20} \times 29978}{40\text{ min} \times 1990\text{ ml/min}} = 1.88 \text{ fibers/cc}$$

12-12-75 D.A.-029 UL Engine Room 626 Boat
90213 Personal sample on Preble (cleaner) picking up pieces of asbestos

$$\frac{\frac{163}{20} \times 30303}{40\text{ min} \times 2130\text{ ml/min}} = 2.90 \text{ fibers/cc}$$

626 12-12-75 D.A.-030 UL Engine Room, frame 132 626 Boat
90214 Area sample when cleaners are working

$$\frac{\frac{48}{20} \times 28710}{35\text{ min} \times 2030\text{ ml/min}} = .97 \text{ fibers/cc}$$

12-12-75 D.A.-031 UL Engine Room, area sample 626 Boat
90215 ~~When~~ Cleaners are finishing up

$$\frac{\frac{94}{20} \times 29707}{40 \times 1990} = 1.75 \text{ fibers/cc}$$

Boat 12-17-75 D.A.-032 UL Engine Room, 626 Boat
90216 small rip-out (5 pieces) in turbine area
area sample 10 feet from rip-out

$$\frac{\frac{20}{20} \times 30303}{23\text{ minutes} \times 2130\text{ ml/min}} = .62 \text{ fibers/cc}$$

EB-CAM-002462

12-17-75 D.A.-033 UL Engine Room, turbine area 626 Boat
90217 frame 128, small rip-out area sample taken immediately after cleaners finished

$$\frac{\frac{24}{20} \times 29707}{15 \text{ min} \times 2130 \text{ ml/min}} = 1.12 \text{ fibers/cc}$$

12-23-75 D.A.-034 LL AMR II 626 Boat
90218 area sample near starboard hull during rip out

$$\frac{\frac{43}{20} \times 30303}{20 \text{ min} \times 1990 \text{ ml/min}} = 1.64 \text{ fibers/cc}$$

12-23-75 D.A.-035 LL AMR II 626 Boat
90219 area sample by aft wall

$$\frac{\frac{226}{20} \times 28710}{15 \text{ min} \times 2130 \text{ ml/min}} = 10.15 \text{ fibers/cc}$$

12-23-75 D.A.-036 UL AMR II 626 Boat
90220 area sample just above hatchway connecting LL to UL

$$\frac{\frac{191}{20} \times 28221}{27 \text{ min} \times 1990 \text{ ml/min}} = 5.02 \text{ fibers/cc}$$

12-30-75 BB-021 626 Boat - Engine Room, mid s/e
90221

$$\frac{\frac{11}{30} \times 29707}{2500 \times 40} = 0.11 \text{ fibers/cc}$$