

PLAINTIFF'S EXHIBIT

CT-1407

TITLE PAGE-STOCK NO. 100TP

INDUSTRIAL HYGIENE SURVEY

Ambler A/C Pipe Plant  
March 23 & 24, 1981  
May 5, 1981

**Smead** MFG. CO. HASTINGS MN - LOS ANGELES - CHICAGO  
LOGAN OH - MCGREGOR TX - LOCUST GROVE GA

CTD019497

Industrial Hygiene Survey

AMBLER A/C PIPE PLANT

March 23-24, 1981



**CertainTeed**

Date

March 27, 1981

To

Bill Magers

Location and mail code

~~Sanbler 258~~

Subject

RESPIRATOR FIT TESTS

From

Janis Woodson *JW*

Location and mail code

1125/4

cc: O. H. Kittilstad - 1125/4

Per our conversation of March 24, 1981 on respirators, attached find copies of:

1. General Industry Standards (29 CFR 1910).
2. OSHA Industrial Hygiene Field Operations Manual (Chapter 3).

Refer to pages 261 and 262 of the General Industry Standard for Respiratory Protection 29 CFR 1910.134(e)(5). This paragraph (highlighted in yellow) requires respirator training and fit tests for employees.

Refer to pages 81 and 83 of the OSHA Industrial Hygiene Field Operations Manual. The sections highlighted in yellow are the procedures and requirements that OSHA compliance officers follow when inspecting a manufacturing location.

This information completely outlines federal regulations for respiratory protection in regard to training and fitting the employees with respirators. The respirators presently being used--3M 8710 and AO Dust Demon--are approved for use in asbestos contaminated atmospheres but are not made with high efficiency filter material and therefore cannot be fit tested.

JLW/tmf

CTD019499

|                                                                  |                                                   |                                  |                                      |
|------------------------------------------------------------------|---------------------------------------------------|----------------------------------|--------------------------------------|
| <b>CertainTeed</b>                                               | Date<br>April 6, 1981                             | To<br>Hank Benhardt              | Location and mail code<br>Ambler 258 |
| Subject<br>AMBLER INDUSTRIAL HYGIENE SURVEY<br>March 23-24, 1981 | From<br><i>Janis Woodson tnf</i><br>Janis Woodson | Location and mail code<br>1125/4 |                                      |

cc: J. McGinley - 2125/2B  
D. Hall - 2125/2B  
O. Kittilstad - 1125/4

Attached find the log of sampling results for samples taken for asbestos analysis and audiodosimetry noise dose during the survey March 23-24, 1981.

Per our conversations over the past week regarding the air sample levels found at the Press Operator Station, Console, Roll-up and Crusher, it is understood that follow-up samples will be taken by Bill Magers to determine the source for these levels. Please keep me informed of the work being done and sample results found for these areas.

When comparing the results of the air samples taken in the Finishing Department during this survey and those taken last year in Finishing, the levels have been substantially reduced by at least 50% and more at some operations. This is no doubt related to the increased attention and maintenance given to the dust collection system.

Noise is still a problem at the plant, especially in Finishing, which will be discussed in detail in the forthcoming survey report.

I will be available after April 10 to make a return visit to help to determine dust sources and to do some follow-up sampling. I am also working with the microscopy lab in Insulation Group to determine the type of fibers found on those samples taken March 23-24. Results of these analyses will not be available until the end of April.

Also attached find copies of the field notes (Air Monitoring Data Sheets) which you requested for use in informing the employees of their exposure levels.

If I can be of any further assistance or if you have any questions regarding the sample results please contact me.

JLW/tnf

Attachments

Industrial Hygiene Survey  
Ambler A/C Pipe Plant  
March 23 & 24, 1981

TABLE  
Personal Fiber Exposures

| No.                           | POSITION<br>LOCATION<br>(DATE)                     | NAME/AREA      | ANALYSIS FOR         | TIME                     | MIN. | RESULT<br>(f/cc) | TWA for<br>Sample<br>Period<br>(f/cc) | REMARKS                                                                                                                               |
|-------------------------------|----------------------------------------------------|----------------|----------------------|--------------------------|------|------------------|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Manufacturing Department      |                                                    |                |                      |                          |      |                  |                                       |                                                                                                                                       |
| 001                           | Mixer<br>Operator<br>(3/23/81)                     | S. Minio       | Fibers<br>(Asbestos) | 001A<br>6:40a<br>9:18a   | 158  | 1.7              |                                       | Cleaned out vacuums on second floor during this sample                                                                                |
| 002                           |                                                    |                |                      | 001B<br>9:18a<br>1:04p   | 226  | 0.25             | 0.71                                  | Manufactured 10" 3300 & 12" 2400 pipe. 8 dumps made this day (27.5% of Fiber Crocidolite)                                             |
| 003                           |                                                    |                |                      | 001C<br>1:04p<br>3:37p   | 153  | 0.35             |                                       |                                                                                                                                       |
| 004                           | Mixer<br>Operator<br>(3/24/81)                     | S. Minio       | Fibers<br>(Asbestos) | 002<br>7:15a<br>7:44a    | 29   | 0.28             | --                                    | Manufacturing 10" & 12" 2400 1 dump made. (30.8% of Fiber Crocidolite)                                                                |
| 005                           | Press<br>Operator<br>(3/23/81)                     | C. Worthington | Fibers<br>(Asbestos) | 003A<br>6:33a<br>9:16a   | 163  | 0.67             |                                       | Manufacturing 10" 3300 & 12" 2400 pipe. Felts: Top-77 hours Bottom-new. No down time                                                  |
|                               |                                                    |                |                      | 003B<br>9:16a<br>1:02p   | 226  | >3.1*            | >3.1*                                 |                                                                                                                                       |
| 007                           |                                                    |                |                      | 003C<br>1:02p<br>3:41p   | 159  | >5.7*            |                                       | Wall/panel installed at approx. 3pm                                                                                                   |
| 008                           | Press<br>Operator<br>(3/24/81)                     | C. Worthington | Fibers<br>(Asbestos) | 004<br>7:47a<br>10:42a   | 175  | >5.0*            | --                                    | Manufacturing 10" & 12" 2400 pipe. Felts: Top-87 hours Bottom-10 hours. Wall/panel installed for this sample. Employee 20 min. break. |
| 009                           | Mandrel<br>Handler<br>(3/23/81)                    | J. Mascola     | Fibers<br>(Asbestos) | 005A<br>6:42a<br>1:05p   | 383  | >0.86*           |                                       | Manufacturing 10" 3300 & 12" 2400 pipe. No down time.                                                                                 |
| 010                           |                                                    |                |                      | 005B<br>1:05p<br>3:51p   | 166  | 0.68             | 0.81                                  |                                                                                                                                       |
| Finishing/Fittings Department |                                                    |                |                      |                          |      |                  |                                       |                                                                                                                                       |
| 011                           | Line #3<br>Lathe<br>(control<br>side)<br>(3/23/81) | A. DeClerico   | Fibers<br>(Asbestos) | 006A<br>6:11a<br>9:00a   | 169  | --               |                                       | Void sample - pump problems                                                                                                           |
| 012                           |                                                    |                |                      | 006B<br>9:00a<br>10:18a  | 78   | --               |                                       | Void sample - pump problems                                                                                                           |
| 013                           |                                                    |                |                      | 006C<br>10:18a<br>12:00n | 102  | 0.26             | 0.15                                  | Finishing 21" 4000 & 5000 pipe and 21" 5000 1/2 MEO's.                                                                                |
| 014                           |                                                    |                |                      | 006D<br>12:32p<br>4:05p  | 213  | 0.099            |                                       | Cleanup 1:10 - 1:20p                                                                                                                  |

CTD019501

\* NOTE: (>) - GREATER THAN - Sample was heavily loaded with particulate, fibers were obscured making fiber analysis difficult.

Industrial Hygiene Survey  
Ambler A/C Pipe Plant  
March 23 & 24, 1981

TABLE \_\_\_\_\_  
Personal Fiber Exposures

| No.<br>81 | POSITION<br>LOCATION<br>(DATE)                                 | NAME/AREA    | ANALYSIS FOR              | TIME            | MIN. | RESULT<br>(f/cc) | TWA for<br>Sample<br>Period<br>(f/cc) | REMARKS                                                                                                 |
|-----------|----------------------------------------------------------------|--------------|---------------------------|-----------------|------|------------------|---------------------------------------|---------------------------------------------------------------------------------------------------------|
| 015       | Line #3<br>Lathe<br>Operator<br>(control<br>side)<br>(3/24/81) | A. DeClerico | Fibers<br>(Asbestos) 007  | 12:55p<br>3:00p | 125  | 0.098            |                                       | Changes made to dust collec-<br>tion system.<br>Finishing 18" 3300-5000 pipe<br>and 18" 5000 1/2 MEO's. |
| 016       | Line #3<br>Lathe<br>Helper<br>(drive<br>side)<br>(3/23/81)     | F. Toley     | Fibers<br>(Asbestos) 008A | 6:13a<br>9:01a  | 168  | 0.061            |                                       | Finishing 21" 4000 & 5000 pipe<br>and 21" 5000 1/2 MEO's.                                               |
| 017       |                                                                |              |                           | 9:01a<br>12:00n | 179  | 0.15             |                                       |                                                                                                         |
| 018       |                                                                |              |                           | 12:34p<br>1:21p | 47   | 0.25             | 0.15                                  | Clean-up 1:10 - 1:20p                                                                                   |
| 019       |                                                                |              |                           | 1:21p<br>4:03p  | 162  | 0.20             |                                       |                                                                                                         |
|           | Line #3<br>Lathe<br>Helper<br>(drive<br>side)<br>(3/24/81)     | F. Toley     | Fibers<br>(Asbestos) 009  | 12:54p<br>3:00p | 126  | 0.25             |                                       | Finishing 18" 3300-5000 pipe<br>and 18" 5000 1/2 MEO's.                                                 |
| 021       | Line #3<br>Inspector<br>(3/23/81)                              | A. Camasso   | Fibers<br>(Asbestos) 010A | 6:25a<br>9:04a  | 159  | 0.18             |                                       | Finishing 21" 4000-5000 pipe<br>and 21" 5000 1/2 MEO's.                                                 |
| 022       |                                                                |              |                           | 9:04a<br>10:47a | 103  | 0.047            | 0.11                                  |                                                                                                         |
| 023       |                                                                |              |                           | 10:47a<br>4:03p | 316  | 0.10             |                                       |                                                                                                         |
| 024       | Line #3<br>Tester<br>Operator<br>(3/23/81)                     | G. Bojaciuk  | Fibers<br>(Asbestos) 011A | 6:14a<br>9:02a  | 168  | 0.34             |                                       | Finishing 21" 4000-5000 pipe<br>and 21" 5000 1/2 MEO's.                                                 |
| 025       |                                                                |              |                           | 9:02a<br>12:56p | 234  | 0.27             |                                       |                                                                                                         |
| 026       |                                                                |              |                           | 12:56p<br>1:22p | 26   | 0.27             | 0.26                                  |                                                                                                         |
| 027       |                                                                |              |                           | 1:22p<br>4:02p  | 160  | 0.15             |                                       |                                                                                                         |

CTD019502

Industrial Hygiene Survey  
Ambler A/C Pipe Plant  
March 23 & 24, 1981

TABLE \_\_\_\_\_  
Personal Fiber Exposures

| No.<br>81 | POSITION<br>LOCATION<br>(DATE)                        | NAME/AREA      | ANALYSIS FOR         | TIME                 | MIN. | RESULT<br>(f/cc) | TWA for<br>Sample<br>Period | REMARKS                                     |
|-----------|-------------------------------------------------------|----------------|----------------------|----------------------|------|------------------|-----------------------------|---------------------------------------------|
| 028       | Line #3<br>Beller<br>(control<br>side)                | J. Lucas       | Fibers<br>(Asbestos) | 012A 6:20a<br>8:58a  | 158  | 0.30             |                             | Belling 21" 4000-5000 pipe                  |
| 029       | (3/23/81)                                             |                |                      | 012B 8:58a<br>12:01p | 183  | 0.24             | 0.23                        |                                             |
| 030       |                                                       |                |                      | 012C 12:35p<br>4:02p | 207  | 0.18             |                             |                                             |
| 031       | Boring<br>Mill #15<br>Operator<br>(3/24/81)           | F. Marincola   | Fibers<br>(Asbestos) | 013A 6:15a<br>10:30a | 255  | 0.47             |                             |                                             |
| 032       |                                                       |                |                      | 013B 10:30a<br>3:14p | 284  | 0.30             | 0.36                        |                                             |
| 033       |                                                       |                |                      | 013C 3:14p<br>4:09p  | 55   | 0.17             |                             |                                             |
| 034       | Boring<br>Mill #54<br>Operator<br>(3/24/81)           | C. Handschin   | Fibers<br>(Asbestos) | 014A 6:02a<br>10:29a | 267  | 0.12             |                             | Boring 18" 3300-5000 and 21"<br>5000 cplgs. |
| 035       |                                                       |                |                      | 014B 10:29a          | -    | -                | 0.13                        | Void sample                                 |
| 036       |                                                       |                |                      | 014C 10:29a<br>3:13p | 284  | 0.16             |                             |                                             |
| 037       |                                                       |                |                      | 014D 3:13p<br>4:09p  | 56   | 0.067            |                             |                                             |
| 038       | Rework<br>Saw/Korit<br>Drill<br>Operator<br>(3/23/81) | E. Enchavarria | Fibers<br>(Asbestos) | 015A 6:15a<br>7:04a  | 49   | 0.30             |                             | Operating Rework Saw<br>12" pipe            |
| 039       |                                                       |                |                      | 015B 7:10a<br>10:32a | 202  | 0.37             | 0.33                        | Operating Korit Drill making<br>8 x 4 Wyes. |
| 040       |                                                       |                |                      | 015C 10:32a<br>1:11p | 159  | 0.36             |                             |                                             |
| 041       |                                                       |                |                      | 015D 1:11p<br>3:58p  | 167  | 0.25             |                             |                                             |
| 042       | Pencil<br>Sharpener<br>Operator<br>(3/24/81)          | D. Rodriguez   | Fibers<br>(Asbestos) | 016A 8:41a<br>10:50a | 129  | 0.34             | 0.31                        | Operating Pencil Sharpener<br>8" 1/4's.     |
| 043       |                                                       |                |                      | 016B 10:50a<br>4:00p | 310  | 0.30             |                             | Putting rings in 18" couplings              |

CTD019503

Industrial Hygiene Survey  
Ambler A/C Pipe Plant  
March 23 & 24, 1981

TABLE \_\_\_\_\_  
Personal Fiber Exposures

| No.<br>81 | POSITION<br>LOCATION<br>(DATE)           | NAME/AREA   | ANALYSIS FOR         | TIME                  | MIN. | RESULT<br>(f/cc) | TWA for<br>Sample<br>Period | REMARKS                               |
|-----------|------------------------------------------|-------------|----------------------|-----------------------|------|------------------|-----------------------------|---------------------------------------|
| 044       | Wet Saw<br>Operator<br>(3/24/81)         | J. Reynolds | Fibers<br>(Asbestos) | 017A 6:21a<br>10:36a  | 254  | 0.27             |                             | Cutting 18" 1/4 lengths.              |
| 045       |                                          |             |                      | 017B 10:36a<br>11:56a | 80   | 0.28             | 0.31                        |                                       |
| 046       |                                          |             |                      | 017C 12:31p<br>3:28p  | 177  | 0.39             |                             |                                       |
| 047       | Wet Saw<br>Helper<br>(3/24/81)           | L. DiAmico  | Fibers<br>(Asbestos) | 018A 6:21a<br>10:35a  | 254  | 0.21             |                             | Cutting 18" 1/4 lengths.              |
| 048       |                                          |             |                      | 018B 10:35a<br>12:35p | 120  | 0.23             | 0.21                        |                                       |
| 049       |                                          |             |                      | 018C 12:35p<br>3:17p  | 162  | 0.18             |                             |                                       |
| 050       | Lehman<br>Lathe<br>Operator<br>(3/23/81) | B. Barnett  | Fibers<br>(Asbestos) | 019A 6:45a<br>9:09a   | 144  | 0.43             |                             | 21" 5000 sewer 1/4 lengths            |
| 051       |                                          |             |                      | 019B 9:09a<br>1:10p   | 241  | 0.21             | 0.35                        |                                       |
| 052       |                                          |             |                      | 019C 1:10p<br>4:15p   | 185  | 0.47             |                             |                                       |
| 053       | Nebel<br>Lathe<br>Operator<br>(3/24/81)  | J. DeSilva  | Fibers<br>(Asbestos) | 020A 6:01a<br>10:28a  | 267  | 0.11             |                             | Making 10" 200 PAD 3's.               |
| 054       |                                          |             |                      | 020B 10:28a<br>3:47p  | 319  | 0.083            | 0.10                        |                                       |
| 055       | Tool<br>Grinder<br>(3/24/81)             | F. DeTuro   | Fibers<br>(Asbestos) | 021 8:14a<br>10:10a   | 116  | 0.14             |                             | Unloading & stacking 10"<br>couplings |

CTD019504

Industrial Hygiene Survey  
Ambler A/C Pipe Plant  
March 23 & 24, 1981

TABLE \_\_\_\_\_  
Area/Environmental Fiber Samples

| No.<br>81 | POSITION<br>LOCATION<br>(DATE)                         | NAME/AREA   | ANALYSIS FOR         | TIME            | MIN. | RESULT<br>(f/cc) | REMARKS                                                                                                      |
|-----------|--------------------------------------------------------|-------------|----------------------|-----------------|------|------------------|--------------------------------------------------------------------------------------------------------------|
| 056       | Bag Opener<br>(3/24/81)                                | Area<br>022 | Fibers<br>(Asbestos) | 7:15a<br>7:44a  | 29   | 0.21             | Setting at Bag Opener on Bag compactor while opener <u>was</u> in operation, making a dump.                  |
| 057       | Bag Opener<br>(3/24/81)                                | Area<br>022 | Fibers<br>(Asbestos) | 2:30p<br>2:55p  | 25   | <0.018**         | Setting at Bag Opener on Bag compactor while opener <u>was not</u> in operation.                             |
| 058       | Pipe Machine<br>Rollup<br>(3/24/81)                    | Area<br>021 | Fibers<br>(Asbestos) | 7:48a<br>10:41a | 173  | >3.06*           | Pump hanging at pipe machine roll-up/press section 5' from floor, 4' from press section, 5' from operator.   |
| 059       | Pipe Machine<br>console/<br>control panel<br>(3/24/81) | Area<br>025 | Fibers<br>(Asbestos) | 7:50a<br>10:41a | 171  | 1.71             | Pump setting on console 5' from floor, 15' from press section, 10' behind operator.                          |
| 060       | Crusher<br>(3/24/81)                                   | Area<br>026 | Fibers<br>(Asbestos) | 7:54a<br>10:34a | 164  | >3.91*           | Pump hanging 4' from floor near control panel. Not crushing but dust collector dust running through cyclone. |

\* NOTE: (>) - GREATER THAN - Sample was heavily loaded with particulate, fibers were obscured making fiber analysis difficult.

\*\* NOTE: (<) - LESS THAN - Fiber concentration on filter found to be less than the average fiber concentration of blank filters.

CTD019505

Industrial Hygiene Survey  
Ambler A/C Pipe Plant  
March 23 & 24, 1981

TABLE \_\_\_\_\_  
Audiotosimetry Results

| No.<br>81                | POSITION<br>LOCATION<br>(DATE)            | NAME/AREA                | TIME           | MIN. | RESULTS                 |        | REMARKS                                                 |
|--------------------------|-------------------------------------------|--------------------------|----------------|------|-------------------------|--------|---------------------------------------------------------|
|                          |                                           |                          |                |      | Eight Hour<br>Dosimeter |        |                                                         |
|                          |                                           |                          |                |      | 85 dBA                  | 90 dBA |                                                         |
| Manufacturing Department |                                           |                          |                |      |                         |        |                                                         |
| 061                      | Mandrel<br>Handler<br>(3/23/81)           | J. Mascola               | 7:20a<br>3:51p | 511  | 103%                    |        | Manufacturing 10" 3300 &<br>12" 2400 pipe               |
| 062                      | Tray Loader<br>(3/24/81)                  | J. Carey                 | 8:45a<br>4:00p | 435  | 54%                     |        | No mandrel change made                                  |
| 063                      | Utility Truck<br>Driver<br>(3/23/81)      | T. Rowan                 | 7:25a<br>3:57p | 512  | 117%                    |        | No mandrel change made                                  |
| Finishing Department     |                                           |                          |                |      |                         |        |                                                         |
| 064                      | Line #3<br>Lathe<br>Operator<br>(3/23/81) | A. DeClerico             | 7:15a<br>4:05p | 530  | 206%                    |        | Finishing 21" 4000-5000 pipe<br>AND 21" 5000 1/2 MEO's. |
| 065                      | Line #3<br>Lathe Helper<br>(3/23/81)      | F. Toley<br><i>Toley</i> | 7:15a<br>4:03p | 528  | 229%                    |        | Finishing 21" 4000-5000 pipe<br>AND 21" 5000 1/2 MEO's. |
| 066                      | Wet Saw<br>Operator<br>(3/24/81)          | J. Reynolds              | 6:21a<br>3:28p | 547  | 171%                    |        | Cutting 18" 1/4 lengths.                                |
| 067                      | Wet Saw<br>Helper<br>(3/23/81)            | L. DaMico                | 7:06a<br>3:57p | 531  | 63%                     |        | Cutting 18" 1/4 lengths.                                |
| 068                      | Korit Drill<br>Operator<br>(3/24/81)      | A. Enchavarria           | 6:30a<br>4:00p | 570  | 102%                    |        | Making 8 x 4 wyes                                       |
| 069                      | Lehman Lathe<br>Operator<br>(3/23/81)     | B. Barnett               | 6:45a<br>4:15p | 570  | 113%                    |        | 21" 5000 sewer 1/4 lengths                              |
| 070                      | Finishing<br>Truck Driver<br>(3/24/81)    | S. Wright                | 6:39a<br>4:05p | 566  | 62%                     |        |                                                         |
| 071                      | Sweeper<br>Operator<br>(3/24/81)          | H. Dukes                 | 6:00a<br>4:09p | 609  | 42%                     |        | On sweeper throughout day.                              |
| Maintenance Department   |                                           |                          |                |      |                         |        |                                                         |
| 072                      | Boiler<br>Operator<br>(3/24/81)           | L. Dukes                 | 8:48a<br>4:12p | 444  | 89%                     |        |                                                         |

CTD019506

## Report

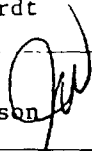
1

Industrial Hygiene Survey

AMBLER A/C PIPE PLANT

May 5, 1981

# CertainTeed

|         |                                       |      |                                                                                                   |                        |            |
|---------|---------------------------------------|------|---------------------------------------------------------------------------------------------------|------------------------|------------|
| Date    | May 19, 1981                          | To   | Hank Benhardt                                                                                     | Location and mail code | Ambler 258 |
| Subject | AMBLER FOLLOW-UP SURVEY - May 5, 1981 | From | Janis Woodson  | Location and mail code | 1125/4     |

cc: J. McGinley - 2125/2B  
D. Hall - 2125/2B  
O. Kittilstad - 1125/4

Attached find the log of results for samples taken for asbestos analysis on May 5, 1981. This survey was made as a follow-up to the March survey in which samples were taken to determine the effectiveness of changes made at the Pipe Machine.

Samples taken at the Pipe Machine during this follow-up survey show greatly reduced fiber levels for the Press Operator and Mandrel Handler, as well as the area sample locations. Manufacturing processes were basically the same this day as back in March. Although the machine ran somewhat faster and had a new bottom felt back in March, the pipe size this day was the same (12").

The Crusher is still an area of concern. The sample results (103-113) have a wide range which leads to the idea that something other than the machinery at the Crusher is causing the fluctuation. Samples were taken when hoppers were dumped and it seems to have an influence on the samples taken at the aisle (103-107) but not the one closer to the back wall (108-112). Again, it is recommended that as changes are made in this area, follow-up samples should be taken in different places around the Crusher area to determine possible problems not always at the same place.

Although the problem at the Pipe Machine has subsided I am still working with the IG microscopy lab to determine the type of fibers found at the Pipe Machine. These results should be known by the middle of June. I apologize for the delay in these analyses.

Comparison fiber counts were made with Bill Magers while at the plant. The microscope was found to be out of phase which leads to erroneous counts. After aligning and setting up the microscope myself, Bill and I recounted a slide. The counts were then found to be within comparable range, but way off from his original count. It has been recommended to Bill before, and I am again insisting, that Bill set up and align the microscope every time he moves the microscope otherwise the counts he makes are in error.

A final report will be written when the results are received from the IG lab. In the meantime, if I can be of any further assistance to you or if you have any comments or questions in regard to this survey please contact me.

JLW/tmf

P.S. Also attached find copies of the field notes (Air Monitoring Data Sheets) which you requested for use in informing the employees of their exposures.

Industrial Hygiene Survey  
Ambler A/C Pipe Plant  
May 5, 1981

TABLE  
Personal Fiber Exposures

| No. | POSITION<br>LOCATION<br>(DATE)  | NAME/AREA      | ANALYSIS FOR         | TIME                    | MIN | RESULT<br>f/cc | TWA FOR<br>SAMPLE<br>PERIOD | REMARKS                                              |
|-----|---------------------------------|----------------|----------------------|-------------------------|-----|----------------|-----------------------------|------------------------------------------------------|
| 073 | Press<br>Operator<br>(5/5/81)   | C. Worthington | Fibers<br>(Asbestos) | 024P<br>6:30a<br>8:54a  | 144 | 0.78           |                             | Manufacturing 12"<br>150 pipe 9 3/4 ton<br>per hour. |
| 074 |                                 |                |                      | 024C<br>8:54a<br>1:01p  | 247 | 0.27           | 0.45                        | Felt hours-<br>Top: 44<br>Bottom: 31 1/2             |
| 075 |                                 |                |                      | 024C<br>1:01p<br>2:00p  | 59  | 0.39           |                             |                                                      |
| 076 | Mandrel<br>Handler<br>(5/5/81)  | J. Mascola     | Fibers<br>(Asbestos) | 024P<br>6:42a<br>9:05a  | 143 | 0.072          | 0.049                       | Manufacturing 12"<br>150 pipe 9 3/4 ton<br>per hour. |
| 077 |                                 |                |                      | 024C<br>9:05a<br>1:50p  | 285 | 0.038          |                             | Felt hours-<br>Top: 44<br>Bottom: 31 1/2             |
| 078 | Crusher<br>Operator<br>(5/5/81) | H. Dukes       | Fibers<br>(Asbestos) | 024A<br>6:52a<br>8:59a  | 127 | 1.16           | 0.69                        | Worked entire day<br>at crusher.                     |
| 079 |                                 |                |                      | 024B<br>8:59a<br>12:02p | 183 | 0.37           |                             |                                                      |
| 080 |                                 |                |                      | 024C<br>12:40p<br>4:00p | 200 | -              |                             | Void Sample-<br>pump problems.                       |

CTD019509

Industrial Hygiene Survey  
Ambler A/C Pipe Plant  
May 5, 1981

TABLE \_\_\_\_\_  
Area/Environmental/Engineering Fiber Samples

| No. | POSITION<br>LOCATION<br>(DATE)           | NAME/AREA | ANALYSIS FOR         | TIME            | MIN | RESULT<br>f/cc | TWA FOR<br>SAMPLE<br>PERIOD | REMARKS                                                                                                                  |
|-----|------------------------------------------|-----------|----------------------|-----------------|-----|----------------|-----------------------------|--------------------------------------------------------------------------------------------------------------------------|
| 081 | Mixing<br>Area<br>(5/5/81)               | Area      | Fibers<br>(Asbestos) | 5:14a<br>6:06a  | 52  | 0.20           |                             | Pump hanging on I<br>beam 15' from<br>mixing pot 6' from<br>floor. Before start<br>up.                                   |
| 082 |                                          |           |                      | 6:06a<br>8:56a  | 170 | 0.11           |                             |                                                                                                                          |
| 083 | Area near<br>Tailing pumps<br>(5/5/81)   | Area      | Fibers<br>(Asbestos) | 7:03a<br>9:03a  | 120 | 0.056          |                             | Pump hanging 5'<br>from floor 5' from<br>pipe machine                                                                    |
| 084 |                                          |           |                      | 9:03a<br>12:59p | 236 | 0.041          |                             |                                                                                                                          |
| 085 |                                          |           |                      | 1:05p<br>4:25p  | 200 | 0.037          |                             |                                                                                                                          |
| 086 | Area at<br>Mandrel<br>Return<br>(5/5/81) | Area      | Fibers<br>(Asbestos) | 5:12a<br>6:07p  | 55  | 0.020          |                             | Pump hanging 15'<br>from Tailing pump<br>5' from Mandrel<br>return. Before<br>start up                                   |
| 087 |                                          |           |                      | 6:07a<br>9:04a  | 177 | 0.028          |                             |                                                                                                                          |
| 088 |                                          |           |                      | 9:04a<br>12:59p | 235 | 0.033          |                             |                                                                                                                          |
| 089 | Rollup<br>(5/5/81)                       | Area      | Fibers<br>(Asbestos) | 6:46            | --  | --             |                             | VOID SAMPLE                                                                                                              |
| 090 |                                          |           |                      | 6:47a<br>8:52a  | 125 | 1.32           |                             | Pump hanging at<br>pipe machine roll-<br>up/press section 5'<br>from floor 4' from<br>press section 5'<br>from operator. |
| 091 |                                          |           |                      | 8:52a<br>1:02p  | 250 | >0.57*         |                             |                                                                                                                          |
| 092 |                                          |           |                      | 1:02p<br>4:25p  | 203 | >0.16*         |                             |                                                                                                                          |
| 093 | Console<br>(5/5/81)                      | Area      | Fibers<br>(Asbestos) | 5:10a<br>6:06a  | 54  | 0.07           |                             | Before start up                                                                                                          |
| 094 |                                          |           |                      | 6:06a<br>8:53a  | 167 | 0.22           |                             | Pump setting on<br>console 5' from<br>floor 15' from<br>press section 10'<br>behind operator.                            |
| 095 |                                          |           |                      | 8:53a<br>12:59p | 246 | 0.10           |                             |                                                                                                                          |
| 096 |                                          |           |                      | 12:59p<br>4:25p | 206 | 0.17           |                             |                                                                                                                          |

CTD019510

\*Note: (>) Greater than - Sample was heavily loaded with particulate, fibers were obscured making fiber analyses difficult.

Industrial Hygiene Survey  
Ambler A/C Pipe Plant  
May 5, 1981

TABLE \_\_\_\_\_  
Area/Environmental/Engineering Fiber Samples

| No. | POSITION<br>LOCATION<br>(DATE)                                  | NAME/AREA | ANALYSIS FOR         | TIME             | MIN | RESULT<br>f/cc | TWA FOR<br>SAMPLE<br>PERIOD | REMARKS                                                                                   |
|-----|-----------------------------------------------------------------|-----------|----------------------|------------------|-----|----------------|-----------------------------|-------------------------------------------------------------------------------------------|
| 097 | 2nd Floor<br>(5/5/81)                                           | Area      | Fibers<br>(Asbestos) | 9:08<br>12:57    | 229 | 0.22           | --                          | Pump 5' from floor<br>#1 mixer above<br>screw conveyor                                    |
| 098 | Mfg. Dept.<br>Fire Hose<br>(5/5/81)                             | Area      | Fibers<br>(Asbestos) | 6:45a<br>8:57a   | 132 | 0.26           | —                           | Pump hanging 4'<br>from floor at fire<br>hose racket at door<br>to locker room            |
| 099 |                                                                 |           |                      | 8:57a<br>3:18p   | 381 | 0.10           |                             |                                                                                           |
| 100 | Aisle near<br>Crusher<br>(5/5/81)                               | Area      | Fibers<br>(Asbestos) | 5:08a<br>6:16a   | 68  | 0.015          |                             | Before start up                                                                           |
| 101 |                                                                 |           |                      | 6:16a<br>8:57a   | 161 | 0.18           | —                           | Pump setting 10'<br>from corner of<br>crusher area 30'<br>from crusher                    |
| 102 |                                                                 |           |                      | 8:57a<br>3:18p   | 381 | 0.087          |                             |                                                                                           |
| 103 | Crusher<br>near Aisle<br>(5/5/81)                               | Area      | Fibers<br>(Asbestos) | 6:55a<br>8:58a   | 123 | 2.89           |                             | Pump hanging above<br>motor 4' from floor<br>near control panel<br>2 hoppers dumped       |
| 104 |                                                                 |           |                      | 8:58a<br>11:41a  | 163 | 0.54           |                             |                                                                                           |
| 105 |                                                                 |           |                      | 12:03p<br>12:33p | 30  | 0.65           | --                          | Shaking bags in<br>dust collector                                                         |
| 106 |                                                                 |           |                      | 12:40p<br>2:18p  | 98  | 0.65           |                             | No hoppers dumped                                                                         |
| 107 |                                                                 |           |                      | 2:18p<br>4:00p   | 102 | 0.45           |                             | Started cleanup<br>3:10                                                                   |
| 108 | Crusher near<br>wall<br>(5/5/81)                                | Area      | Fibers<br>(Asbestos) | 6:54a<br>8:59a   | 125 | 2.15           |                             | Pump hanging 5'<br>from floor 3' from<br>wall above goods<br>on floor<br>2 hoppers dumped |
| 109 |                                                                 |           |                      | 8:59a<br>12:03p  | 184 | 0.99           |                             |                                                                                           |
| 110 |                                                                 |           |                      | 12:03p<br>12:33p | 30  | 1.07           | —                           | Shaking bags in<br>dust collector                                                         |
| 111 |                                                                 |           |                      | 12:40p<br>2:18p  | 98  | 1.56           |                             | No hoppers dumped                                                                         |
| 112 |                                                                 |           |                      | 2:18p<br>4:00p   | 82  | 0.098          |                             | Started cleanup<br>3:10                                                                   |
| 113 | At crusher<br>Above Rotary<br>Valve Exhaust<br>Bags<br>(5/5/81) | Area      | Fibers<br>(Asbestos) | 12:02p<br>12:33p | 31  | 2.79           | --                          | Shaking dust<br>collector bags<br>Visible dust<br>released at Bags.                       |

CTD019511

*Amber*

2/5/8 015/1 05/18/1

|                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>CONTAMINANT</b></p> <p><input type="checkbox"/> FIBERGLASS</p> <p><input checked="" type="checkbox"/> ASBESTOS</p> <p><input type="checkbox"/> TOTAL DUST</p> <p><input type="checkbox"/> SILICA DUST</p> <p><input type="checkbox"/> ASPHALT FUMES</p> <p><input type="checkbox"/> VINYL CHLORIDE (MONOMER)</p> <p><input type="checkbox"/> FORMALDEHYDE</p> <p><input type="checkbox"/> PHENOL</p> <p><input type="checkbox"/> NOISE</p> | <p><b>SAMPLING METHOD</b></p> <p><input checked="" type="checkbox"/> OPEN FACE</p> <p><input type="checkbox"/> CLOSED FACE</p> <p><input type="checkbox"/> CYCLONE</p> <p><input type="checkbox"/> CLOSED FACE</p> <p><input type="checkbox"/> CHARCOAL TUBE</p> <p><input type="checkbox"/> IMPINGERS, TWO IN SERIES</p> <p><input type="checkbox"/> SILICA GEL</p> <p><input type="checkbox"/> AUDIODOSIMETER</p> | <p><b>SAMPLING MEDIA</b></p> <p><input checked="" type="checkbox"/> 0.8µ MCEF, MILLIPORE FILTER</p> <p><input type="checkbox"/> 5µ PVC FILTER</p> <p><input type="checkbox"/> GLASS FIBER-SILVER MEM. FILTER</p> <p><input type="checkbox"/> 150 mg. CHARCOAL</p> <p><input type="checkbox"/> SODIUM BISULFITE</p> <p><input type="checkbox"/> 300 mg SILICA GEL</p> <p><input type="checkbox"/> 85 dBA</p> <p><input type="checkbox"/> 90 dBA</p> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**EQUIPMENT**

☒ DUPONT F4000 PUMP    ☐ MSA PUMP

☒ ELIUD SUPER PUMP    ☐ DUPONT D376 AUDIODOSIMETER

**EMPLOYEE NAME** *Charles Worthington*    **DEPARTMENT / LINE** *12" / 50*

**JOB** *Plastic Operator*    **PRODUCT** *12" / 50*

**EXHAUST SYSTEMS**

☒ FUNCTIONING NORMALLY    ☐ NOT FUNCTIONING NORMALLY

**WEATHER CONDITIONS**

**OUTSIDE TEMPERATURE °F**    **WIND DIRECTION**    **WIND VELOCITY MPH**

☐ 1-Sunny    ☐ 3-CLOUDY    ☐ 5-HUMID    ☐ 7-RAIN

☐ 2-PTLY    ☐ 4-FOG    ☐ 6-SHOWERS    ☐ 8-SNOW

| CONTROL NO. | PUMP SERIAL | SAMPLE NUMBER | TIME  |      | TOTAL MINUTES | LPM  | VOLUME LITERS | ANALYSIS RESULT | AIRBORNE CONCENTRATION |
|-------------|-------------|---------------|-------|------|---------------|------|---------------|-----------------|------------------------|
|             |             |               | START | STOP |               |      |               |                 |                        |
| 073         | 65194       | 166           | 6:30  | 8:54 | 144           | 1.76 | 253.44        | 198445          | 0.78/1cc               |
| 074         |             | 243           | 8:54  | 1:01 | 247           | 1.76 | 434.72        | 115583          | 0.27/1cc               |
| 075         |             | 206           | 1:01  | 2:00 | 51            | 1.76 | 103.84        | 40409           | 0.39/1cc               |
|             |             |               |       |      | 460           |      |               | TWA             | 0.45/1cc               |

**DID EMPLOYEE WEAR RESPIRATOR?**    **IF SOMETIMES, WHEN?**    **RESPIRATOR MAKE & MODEL**

☐ YES    ☐ NO    ☐ SOMETIMES

| CONTROL NO. | DOSIMETER SERIAL | CELL NO. | START TIME | STOP TIME | TOTAL MINUTES | READOUT RESULT | 8 HOUR CORRECTED EXPOSURE - % |
|-------------|------------------|----------|------------|-----------|---------------|----------------|-------------------------------|
|             |                  |          |            |           |               |                |                               |

**DID EMPLOYEE WEAR HEARING PROTECTION?**    **IF SOMETIMES, WHEN?**    **MAKE & MODEL**

☐ YES    ☐ NO    ☐ SOMETIMES

**REMARKS, SKETCHES**

*Felt Jaws: Top 4x  
Bottom 3 1/2*

*Plastic being under Anvil Roll.*

# AIR MONITORING DATA SHEET

CTD019513

*Amble*

11/03/81

|                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><input checked="" type="checkbox"/> FIBERGLASS</p> <p><input checked="" type="checkbox"/> ASBESTOS</p> <p><input type="checkbox"/> TOTAL DUST</p> <p><input type="checkbox"/> SILICA DUST</p> <p><input type="checkbox"/> ASPHALT FUMES</p> <p><input type="checkbox"/> VINYL CHLORIDE (MONOMER)</p> <p><input type="checkbox"/> FORMALDEHYDE</p> <p><input type="checkbox"/> PHENOL</p> <p><input type="checkbox"/> NOISE</p> | <p><input checked="" type="checkbox"/> OPEN FACE</p> <p><input type="checkbox"/> CLOSED FACE</p> <p><input type="checkbox"/> CYCLONE</p> <p><input type="checkbox"/> CLOSED FACE</p> <p><input type="checkbox"/> CHARCOAL TUBE</p> <p><input type="checkbox"/> IMPINGERS, TWO IN SERIES</p> <p><input type="checkbox"/> SILICA GEL</p> <p><input type="checkbox"/> AUDIODOSIMETER</p> | <p><input checked="" type="checkbox"/> 0.8μ MCEF, MILLIPORE FILTER</p> <p><input type="checkbox"/> 5μ PVC FILTER</p> <p><input type="checkbox"/> GLASS FIBER-SILVER MEM. FILTER</p> <p><input type="checkbox"/> 150 mg CHARCOAL</p> <p><input type="checkbox"/> SODIUM BISULFITE</p> <p><input type="checkbox"/> 300 mg SILICA GEL</p> <p><input type="checkbox"/> 85 dBA</p> <p><input type="checkbox"/> 90 dBA</p> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

EQUIPMENT  
☐ DUPOINT F4000 PUMP ☒ MSA PUMP  
☐ EINHIDE SUPER PUMP ☐ DUPOINT D176 AUDIODOSIMETER

EMPLOYEE NAME: *Harvie Dukes* DEPARTMENT / LINE: \_\_\_\_\_  
 JOB TITLE: *Crusher Operator* MANUFACTURING PRODUCT: \_\_\_\_\_

LEAKAGE: ☐ CONTAINS STATEMENTS ☐ NOT FUNCTIONING NORMALLY

WEATHER & CONDITIONS

|                        |                |                   |                                                                                                                                                                                                                                                 |
|------------------------|----------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OUTSIDE TEMPERATURE °F | WIND DIRECTION | WIND VELOCITY MPH | <input type="radio"/> 1-Sunny <input type="radio"/> 3-Cloudy <input type="radio"/> 5-HUMID <input type="radio"/> 7-RAIN<br><input type="radio"/> 2-Fog <input type="radio"/> 4-FOG <input type="radio"/> 6-SHOWERS <input type="radio"/> 8-SNOW |
|------------------------|----------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| CONTROL NO. | PUMP SERIAL | SAMPLE NUMBER | TIME  |       | TOTAL MINUTES | LPM  | VOLUME LITERS | ANALYSIS RESULT | AIRBORNE CONCENTRATION |
|-------------|-------------|---------------|-------|-------|---------------|------|---------------|-----------------|------------------------|
|             |             |               | START | STOP  |               |      |               |                 |                        |
| 078         | 2036        | ✓ 268         | 6:52  | 8:59  | 127           | 1.85 | 234.95        | 211429          | 1.16 / cc              |
| 079         |             | ✓ 261         | 8:59  | 12:02 | 183           | 1.85 | 338.55        | 125027          | 0.37 / cc              |
| 080         |             | ✓ 279         | 12:40 | 4:00  | 200           | 2010 |               | 107881          | pump slow              |
|             |             |               |       |       |               |      |               | GWA             | 0.69                   |

DID EMPLOYEE WEAR RESPIRATOR? ☐ YES ☐ NO ☐ SOMETIMES

| CONTROL NO. | DOSIMETER SERIAL | CELL NO. | START TIME | STOP TIME | TOTAL MINUTES | READOUT RESULT | 8 HOUR CORRECTED EXPOSURE - % |
|-------------|------------------|----------|------------|-----------|---------------|----------------|-------------------------------|
|             |                  |          |            |           |               |                |                               |

DID EMPLOYEE WEAR HEARING PROTECTION? ☐ YES ☐ NO ☐ SOMETIMES

MENTS, SKETCHES

*pump off at lunch*  
*268-2 happens*  
*stopped crushing 1:45 nothing going thru system*  
*lost sleep 3:25*  
*pump slow End of day OK Half*

CTD019514

# CertainTeed

|                                                           |                      |                          |                           |              |
|-----------------------------------------------------------|----------------------|--------------------------|---------------------------|--------------|
| To<br>D. Hall                                             | Mail Code<br>2125/2B | From<br>O. H. Kittilstad | Mail Code<br>1125/4       | Ext.<br>7765 |
| Subject<br><br>AMBLER ASBESTOS FIBER SURVEILLANCE PROGRAM |                      |                          | Date<br><br>July 28, 1981 |              |

cc: J. McGinley - 2125/2B  
W. Blakeslee - 2126/00

During the Industrial Hygiene Survey at Ambler in May, 1981, we reviewed the in-plant air sampling program which is well established at Ambler. Several recommendations to improve the program are as follows:

1. A conscious attempt should be made to include all employees in the sampling protocol.
2. Employee exposures should be conducted to obtain an 8 hour time weighted average. A minimum of 7 hours of sampling including 3 to 4 samples for the total period should be obtained. Reports being received in this office show TWA's are being calculated on samples of 4 or less hours duration.
3. Pump calibrations should be made on a regular basis. Preferably, pumps should be calibrated prior to and following each days use. Regular calibration of the pumps should be made in any event to insure that the flow rate and rotameter reading are in calibration. Accurate records of the calibrations should be maintained.
4. We observed during the survey that W. Magers' microscope was out of alignment. The microscope should be set up and aligned before each use and whenever moved. This should include a phase ring alignment. In addition, the porton reticle should be calibrated every 6 months. Poor alignment and microscope calibration can seriously contribute to erroneous fiber counts.
5. Care should be taken to insure that a minimum amount of mounting solution is used to dissolve the filter. Too much solution may cause fibers to drift from filter counting area. It also makes it difficult to actually tell where the filter slice is.

I would appreciate your informing me of your actions to implement these recommendations.

OHK/car



CTD019515

|                                  |                         |                                                                  |                                                                       |
|----------------------------------|-------------------------|------------------------------------------------------------------|-----------------------------------------------------------------------|
| <b>CertainTeed</b><br>Subject    | Date<br>August 11, 1981 | To<br>Darwin Hall<br>From <i>[Signature]</i><br>O. H. Kittilstad | Location and mail code<br>2125/2B<br>Location and mail code<br>1125/4 |
| AMBLER INDUSTRIAL HYGIENE SURVEY |                         |                                                                  |                                                                       |

cc: John McGinley - 2125/2B  
 Hank Benhardt - Ambler 258  
 Bill Blakeslee - 2126/00  
 John Kutzler - 1125/1

Attached is the Ambler Industrial Hygiene Survey final report.

OHK/car

01-25-0009 10/77

CTD019516

## INDUSTRIAL HYGIENE SURVEY

Ambler A/C Pipe Plant  
March 23 & 24, 1981  
May 5, 1981

### INTRODUCTION

An Industrial Hygiene Survey was conducted at the Ambler Asbestos-Cement Pipe Plant March 23 & 24 with a follow-up survey made on May 5, 1981 by Janis Woodson, Corporate Health & Safety.

The survey was conducted to audit an on-going in-plant fiber exposure surveillance program and to follow-up on employee exposures to noise. Sixty-three personal air sample measurements were made during the survey, along with 38 Area/Environmental and Engineering samples. A follow-up sound pressure level survey supplemented by 12 personal audiodosimetry exposures was also conducted.

The appendices to the report document the air sampling methodologies, the analysis techniques, and the current standards used in evaluating the data. The field notes and in-house laboratory documentation of this survey are on file in Corporate Health and Safety.

This report is an "Employee Exposure Record" as defined in 29 CFR 1910.20 and must be retained indefinitely in the plant and made available upon request to those federal officials/designees as specified in 29 CFR 1910.20 (d).

### SUMMARY

Little to no action has been taken on 8 of the 13 recommendations made in our survey of last year. A summary of the status of these recommendations is provided.

Excessive noise exposure is the major health problem found during this survey. A recommendation to obtain an expert consultant on engineering noise control is made. Improvements in the hearing conservation program, are also recommended.

All personal exposures to asbestos fibers were found to be less than the current OSHA 2 fiber/cc standard.

Area samples in the Crusher Area in excess of 2 fibers/cc were measured. A Time Weighted Average personal exposure sample on the Crusher Operator was 0.69 f/cc.

Improvements in the asbestos exposure levels were found in the Bag Opener Area, and the Finishing and Fittings Department.

Ambler A/C Pipe Plant  
 Manufacturing Schedule  
 March 23 & 24, 1981  
 May 5, 1981

|                                 | <u>Manufacturing<br/>Department</u>                                                                                                                                                                              | <u>Finishing/Fittings<br/>Department</u>                                                                                                                                                                                                                           |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Monday<br>3/23/81<br>1st Shift  | 10" 3300 pipe<br>12" 2400 pipe<br>10 hours - no downtime<br>9.4 tons/hr.<br>Felt hours - Top: 77<br>Bottom: new<br>Furnish: #13 & #23<br>Batch: 12.8% Fiber<br>(27.5% Crocidolite Fiber)<br>Vat Temperature: 72° | Lathe #3: 21" 4000 & 5000 pipe<br>21" 5000 1/2 MEO's                                                                                                                                                                                                               |
| Tuesday<br>3/24/81<br>1st Shift | 10" & 12" 2400<br>9 3/4 hrs. - 1/4 hr. downtime<br>9.6 tons/hr.<br>Felt hours - Top: 87<br>Bottom: 10<br>Furnish: #23 & #12<br>Batch: 13.7% Fiber<br>(30.8% Crocidolite Fiber)<br>Vat Temperature: 80°           | Lathe #3: 18" 3300 & 5000 pipe<br>18" 5000 1/2 MEO's<br>Boring Mills: 18" 3300 & 5000 cplgs.<br>21" 5000 cplgs.<br>Rework: 12"<br>Korit: 8 x 4 wyes<br>Pen. Sharp.: 8" 1/4's<br>Wet Saw: 18" 1/4 lengths<br>Lehman: 21" 5000 1/4 lengths<br>Nebel: 10" 200 PAD 3's |
| Tuesday<br>5/5/81<br>1st Shift  | 12" 150 pipe<br>8 hours - no downtime<br>8.9 tons/hr.<br>Felt hours - Top: 44<br>Bottom: 31 1/2<br>Furnish: #39<br>Batch: 16.1% Fiber<br>(31.2% Crocidolite Fiber)<br>Vat Temperature: 94°                       | --                                                                                                                                                                                                                                                                 |

Industrial Hygiene Survey  
Ambler A/C Pipe Plant  
March 23 & 24, 1981  
May 5, 1981

#### ASBESTOS FIBER MEASUREMENTS

Table I lists the results of personal exposure samples on March 23 and 24, 1981. Table IV lists the results of personal exposure samples during the follow-up survey on May 5, 1981. Area and Engineering sample results are listed in Table II and V. Area samples represent general environmental conditions at the location sampled. Engineering samples represent specific point sources, not related to exposure, for the purpose of detecting sources of fiber release.

A summary comparison of last years fiber levels with the results of this survey is made in Table VI.

#### Manufacturing Department

An automatic bag opener has been installed since last year's survey. The mixer operators Time Weighted Average (TWA) exposure was 0.71 f/cc this year (#001-003) as compared to 2.36 f/cc last year. An area sample taken in the Bag Opener was 0.21 f/cc (#056), which shows a reduction in fiber levels compared to the manual dumping method.

No open/torn bags or loose fibers were found at the Bag Opener area or in the fiber warehouse.

Fiber levels in excess of 2.0 f/cc were measured in area samples at the Pipe Machine and Press Operators work stations (Samples #006,007 and 008). The source of the airborne fibers was not obvious. A follow-up study by plant personnel attributed the excess levels to air currents disturbing fibers under the pipe machine. A plastic curtain was installed across the machine at and below the anvill roll. Subsequent samples (Samples #073, 075 and 089-092) found substantially reduced levels for these job positions.

Area samples were also taken around the pipe machine/manufacturing area to determine if air currents were carrying the particles in another direction. This was found to be negative as shown in samples 081 - 099 (Table V).

An Area sample at the press section/roll up area was found to be 1.32 f/cc (#090). Further study of the source and contributing factors such as air movements disturbing fibers should be conducted. Care should be taken in comparing the effectiveness of engineering changes by insuring that comparable measurements include sampling under the same manufacturing conditions (e.g., same type/size pipe, tons per hour and blend/formula).

Industrial Hygiene Survey  
Ambler A/C Pipe Plant  
March 23 & 24, 1981  
May 5, 1981

The use of used felts has been eliminated at the entry to the primary tunnel, although the use of this material is still found in other areas of the plant (i.e., entrance to the Maintenance Machine Shop, other tunnel openings and in shipping - felt strips are used to pad the chains when securing the load to the trailer). The used felt may contain asbestos fibers and upon drying may release asbestos fibers when cut, handled, moved, or abraided. Our recommendation of last year, that the use of used felt in all of the areas be discontinued, is repeated.

#### Crusher

An area sample (#060) on 3/24/81 measured greater than 3.91 fiber/cc near the control panel of the Crusher. In an attempt to shed light on the source of the fiber, area and engineering samples were taken on a follow-up survey on 5/5/81. A TWA personal exposure sample taken on the Crusher Operator during the follow-up (078 & 079) measured 0.69 f/cc.

The area and engineering samples (100-113) show no consistent pattern of Crusher area activity producing elevated fiber counts. Visual observation and results of 2 of the 13 samples (110,113) indicate the shaking of dust collector bags during employee breaks and lunch may be a contributing factor, the actual source being the rotary valve exhaust bags. Samples 103 and 108 suggest that hopper dumping may also be a contributing factor.

While the survey revealed no apparent excess exposure to the Crusher Operator, an engineering study of this operation is recommended to determine the source of airborne fiber in this area.

Industrial Hygiene Survey  
Ambler A/C Pipe Plant  
March 23 & 24, 1981  
May 5, 1981

#### Finishing/Fittings Department

Time weighted average personal exposure samples in this department ranged from 0.10 to 0.36 f/cc (Sample #011 to 055). Significant improvement is noted over the January 1980 measurements (See Table VI). The column labeled ">0.5 f/cc", shows a decrease from 47% last year to only 2% this year. The increased attention given to ventilation and dust collection system by supervisors in the department has proven effective.

An accumulation of tailings was observed on the floor between the Lathe and Tester on Lathe Line #3. Likewise, the Lehman Lathe had accumulated tailings. The apparent source of the tailing deposits is an inadequate velocity in the exhaust ducting to transport the heavy tailings. This results in a blocking of the ductwork, further lessening fiber transport in the duct. A smoke tube test found a negative flow from the duct. Also, the operator uses the flexible exhaust ductwork as a local vacuuming source and tailings accumulated in the duct drop out onto the floor.

Engineering should review these operations. A possible solution to the tailings cleanup is a portable industrial vacuum cleaner.

#### NOISE MEASUREMENTS

Noise exposures in excess of the 90 dBA OSHA standard are pervasive in this plant. A comparison of this survey's noise data with last years show little noise reduction has been achieved. A number of suggestions to reduce noise were submitted in our report of last year. Little has been done to implement those recommendations. Those recommendations are repeated.

If the group and/or the plant does not have the expertise to implement those recommendations and/or believes additional outside expertise in noise control engineering is required, the additional recommendation is made that such outside consultation be obtained. Corporate Health & Safety will be happy to work with the group to obtain an outside consultant.

Table III and Figures 1 and 2 show the results of audiodosimeter and sound pressure level measurements obtained in this survey.

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NOTE: All audiodosimetry measurements in this survey were made with the dosimeter set at the 85 dbA cutoff. This results in slightly conservative estimates of the OSHA 90 dbA exposure measurement guidelines for noise levels below about 88 dbA and little to no difference for those exposure above 88 dbA. Conversely, the 85 dbA cutoff, estimates on the low side for the OSHA Hearing Conservation Amendment Standard (currently in an administrative deferral) which sets the cutoff at 80 dbA. A review of the sound-pressure level measurements at the Ambler Plant indicate that in those positions where the audiodosimeter readings exceed 100% with the 85 dbA cutoff, that the SPL's are generally above 88 dbA. As a result there should be little difference in determining percent of exposure regardless of the dosimeter cutoff position.

The OSHA standard, 29 CFR 1910.95 (a-b) requires that engineering and /or administrative measures (e.g. job rotation) must be undertaken when exposure exceeds 90 dbA for an 8 hour Time Weighted Average. Likewise, that hearing protection is mandatory for exposures in excess of 90 dbA.

The deferred Hearing Conservation Amendment 29 CFR 1910.95 (c-i) requires audiometric testing, non-mandatory hearing protection, training and other hearing conservation practices for exposure of 85 dbA or greater for an 8 hour TWA. It is our opinion that the OSHA 85 dbA action level will not be changed. There is adequate documentation that at 85 dbA exposure, 15 percent of workers will suffer hearing impairment. [At 90 dbA, 21 to 29% of workers will suffer impairment]. To protect our employees hearing and minimize future liability for hearing loss compensation, a hearing conservation program pegged to 85 dbA is recommended regardless of OSHA's requirements.

#### Manufacturing Department

Those employees in the manufacturing department exceeding the 8 hour allowable dose (100% 90 dbA mode) during Dec. 79/Jan. 80 survey were: Machine Tender, Mandrel Handler, Tray Loader, and Utility Truck Driver. During this survey 3 of the above 4 job positions were resampled with the Mandrel Handler (061) and Utility Truck driver (063) again exceeding the allowable noise dose (100%). The tray loader's exposure (062) was substantially lower which is attributed to the fact that no mandrel change was made during the shift.

Recommendations made last year were to:

1. Start by installing air mufflers on pipe machine air cylinders
2. Install sound absorbing pads on metal to metal impact and roll surfaces
3. In the interim, hearing protectors should be worn by employees.

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The first two recommendations have yet to be completed. The Mandrel Handler's and Press Operator's work stations were both posted as required hearing protection areas but employees in the areas were not wearing hearing protectors. An OSHA Inspector when touring the facility would cite the plant for this. Wherever it is posted that hearing protection is required it must be enforced.

#### Finishing/Fittings Department

Eight audiodosimeter measurements were taken in Finishing/Fittings. Excessive noise levels, those over 100%, were detected for Lathe Line #3 operator (064), Lathe Line #3 Helper (065), Wet Saw Operator (066), Korit Drill Operator (068) and Lehman Lathe Operator (069). Four of these five job positions were reported as excessive last year.

The following was recommended for the #3 Lathe Line last year: "Air release noise is most prominent at the control operator side..... Control of noise at this area should be initiated by the installation of air silencers at the Lathe Operator's station, control side."

The report went on to recommend: "... all employees whose job positions were found to exceed 100% should be required to wear hearing protection. It is recommended that several types of hearing protectors be made available to employees so that they can choose the one most comfortable. These machines and job positions should be posted with signs requiring the use of hearing protection. These employees should also be provided with annual audiometric examinations."

It was also stated: "If engineering controls cannot reduce the levels to 90 dBA, consideration should be given to administratively control the noise by having the employees change positions along the finishing line. By rotating the employees through job positions on an hourly basis, and by engineering reductions, it may be possible to reduce all employee exposures to less than 100%."

The need for air mufflers at the #3 Lathe Line was again pointed out to plant management (shown in Figure #1), as was the need to enforce the use of hearing protection. On the follow-up survey May 5th the air noise at the Lathe had been reduced considerably for the lathe operator. The actual lathing of the pipe, especially the final cut is the greatest noise problem and was still found to be above acceptable levels, therefore it is still recommended that administrative controls (i.e., job rotation) be instituted until these levels are substantially reduced. This area still needs to be posted as a required hearing protection area and the use of hearing protection enforced.

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The wood saw was found to range from 92 - 98dBA when actually cutting. This is above the allowable noise level but the cutting cycle is not constant and no one employee is exposed to this level for 8 hours.

The following suggestions for noise reduction are carried over from last year.

1. A sound absorptive barrier built between FD9 Coupling Saw and #10 Rework Saw would reduce noise levels for both saw operators.
2. A sound absorptive barrier panel (with plastic viewing window) built into the rework saw handle would reduce the saw operators exposure.
3. #15 & 16 Coupling Mills need air mufflers to reduce the periodic bursts of noise. Further reduction can be obtained by applying sound absorbing foam inside the mills.
4. Reduction of noise at the crusher could be accomplished by lining non wearing surfaces inside the crusher with sound absorbing acoustics.
5. Installation of noise barriers walls or curtains between fittings department equipment would reduce noise levels for the entire department.

Until noise is reduced by engineering or administrative controls it is imperative that hearing protection use be enforced.

All plant positions should be reviewed to determine possible employee noise exposures and where additional noise measurements are required. (i.e., Lathe Lines #1 & #2 as well as other operations not covered by this report).

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#### STATUS OF 1980 RECOMMENDATIONS

It is recommended:

1. That a thorough review of the OSHA Asbestos Standard, 1910.1001, be conducted by a panel of plant management personnel to reassess the degree of Ambler plant compliance with that standard. Special emphasis should be placed on personal monitoring to determine 8-hour exposures in those positions where excess levels were determined by this survey.

Status: Asbestos Monitoring Data Sheets received here in Corporate Health & Safety show calculated TWA's on samples totaling less than 4 hours. The number of people being sampled is ample but an 8 hour TWA is mandatory to determine the full shift exposure and to comply with OSHA Regulations.

2. That followup work consisting of short term samples be taken in and around the restroom, locker room and lunch room areas.

Status: To date Corporate Health & Safety has not received results of these samples.

3. That whenever any changes - minor or major - are made to manufacturing process/systems, fiber exposure measurements should be made and followup work done to assure that exposures are well within standards at all times.

Status: This is an on going recommendation.

4. That a plant level Respirator Control Unit Program be developed using the concepts presented in Section C of the CertainTeed Health and Safety Manual and Appendix II to this report.

Status: Fit testing, one of the requirements of an OSHA Required Respirator Program is not being done. It is doubtful as to the completeness of the rest of the plant's program. Paragraphs 1 & 2 on Page 7 in the body of the survey report states: "A very large drawback with the 3M 8710 is that employees cannot be properly fit tested to assure us that when an employee is wearing the respirator, he is being properly protected. Undetected leaks around the nose or face due to facial contour lead to false security that the respirator is in fact offering protection. It is especially important that all employee's who are required to wear respirators be fit tested." "... A single use respirator, 3M 9900, as well as other permanent half-mask respirators approved by NIOSH for protection against asbestos containing dusts should be utilized. These should also be made available to all employees who request a respirator."

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At present the 3M 8710 and AO Dust Demon Masks are being used. These respirators are not fit testable as presently required by OSHA and should be replaced by the 3M 9900 for use in required respirator areas and made available to employees requesting them.

5. That housekeeping be improved in the manufacturing area and also that it include vacuuming and cleaning of machine and structural surfaces in and around the area.

Status: General Housekeeping has been improved throughout the plant especially in the finishing/fittings department.

6. That engineering studies be made to isolate the fiber source at the pipe machine and to explore the feasibility of exhaust ventilation to control fibers.

Status: One fiber source has been located at the Pipe Machine which has been somewhat contained by the plastic curtain installed at/below the anvil roll.

A continual study should be made in this area to be assured levels remain at the present levels.

7. That when dry scrap pieces are moved that they be wet down to control dust during disposal.

Status: A wet sweep program is in effect for all dust on floors.

8. That a series of fiber samples be taken at the shot blaster, shot blasting area and on the Shot Blaster Operator while it is in operation.

9. That further monitoring be done on those employees involved in scrapping and sanding mandrels while on racks over their heads as well as those resting on the floor.

Status: Corporate Health and Safety has received results of only 1 sample taken at the Shot Blaster and Mandrel Scrapping Operation which was 1.29 f/cc. It is essential that monitoring be done at this operation to document present levels, and that an assessment be made to determine possible changes that should be made to reduce fiber levels.

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10. That those employees in the Finishing and Fittings Department vacuum more frequently throughout the shift to help reduce background fiber levels.

Status: The fiber levels in this department have been substantially reduced by the extended effort of supervisors and employees.

11. The text of this report contains a number of suggestions for the control of noise exposure. If the methods recommended or other engineering and/or administrative controls cannot feasibly reduce the noise to acceptable levels, a hearing conservation program to include the mandatory use of ear defenders and periodic audiometric testing of exposed employees must be implemented.

Status: Implementation of noise control recommendations are not apparent. Mandatory use of hearing protection must be enforced where applicable.

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STATUS OF 1980 ENGINEERING REPORT RECOMMENDATIONS

1. That the heater in the area of the fiber dump be redirected or replaced by a non-forced air heating unit.

Status: Completed 1980.

2. That until the automatic bag opener is put in operation, the blast gate at the fiber dump be positioned to obtain optimal velocity for control of fiber dispersion.

Status: Completed 1980 and the Automatic Bag Opener is presently in use.

3. That a non-asbestos sealer be used in place of the A/C mud presently being used in an around the manufacturing area.

Status: The use of the A/C mud has been reduced, although there are still some places where it is being used.

4. That the exhaust ventilation to the Mixer/Blender be changed to provide permanent control of dust at this area.

Status: Recent samples show some improvement has been made in the ventilation at this area.

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# RECOMMENDATIONS

It is recommended that:

1. The on-going study should be made of the manufacturing area, especially at the press section/roll up area to determine wind currents and other dust sources, be continued.
2. The use of used felt in all areas of the plant and shipping be discontinued.
3. The on-going study of the Crusher Area to determine dust sources at this area and to measure the effectiveness of changes be continued.
4. The problem with the accumulation of tailings at Lathe Line #3 and the Lehman Lathe be studied and corrected.
5. Hearing Conservation programs with annual audiometric examinations should be established for employees whose exposures exceed 85 dBA level for an 8-hour period, i.e., a 50% reading on the Audiodosimeter.
6. Employees with exposures exceeding 90 dBA on an 8-hour Time Weighted Average, i.e., 100% reading on audiodosimeter should be required to wear hearing protection.

Those job positions tested and found to exceed the 8 hour allowable dose (100%) during the Dec. 79/Jan. 80 survey and this survey are:

Manufacturing      - Machine Tender  
                               Mandrel Handler  
                               Tray Loader  
                               Utility Truck Driver  
                               Crusher Operator

Finishing/Fittings -  
       #3 Lathe Operator                      FD13 Universal Mill Operator  
       #3 Lathe Helper                        FD28 Korit Drill Operator  
       #3 Inspector                            FD21 Wet Saw Operator  
       #3 Tester Operator                    Pencil Sharpener Operator  
       FD16 Boring Mill Operator            FD7 Lehman Lathe Operator  
       FD9 Coupling Saw Operator           FD10 Rework Saw Operator

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7. The following areas be posted as required hearing protection areas:
  - (a) Lathe Line #3 Operator Work Station
  - (b) Lathe Line #3 Helper Work Station
  - (c) Lathe Line #3 Tester Operator Work Station
  - (d) Lathe Line #3 Inspector Work Station
  - (e) FD 16 Boring Mill Operator Work Station
  - (f) Mandrel Return & Change Conveyor Area
8. Previous recommendations (Dec. 79/Jan. 80 survey) be implemented and suggestions be considered for Manufacturing & Finishing/Fittings noise reduction. Help from an outside consultant should be obtained if the expertise is not available within the plant or group.
9. A review of all plant positions should be made to determine possible employee noise exposures for all areas of the plant.
10. Until noise is reduced by engineering controls or administrative means, that hearing protection use be enforced.
11. When hearing protection is required, several types of hearing protection should be made available for the employees to choose from (i.e., disposable plugs, reusable earplugs - with/without neckcord and ear muffs).
12. That a quarterly status report on all of the above recommendations be made to Corporate Health and Safety.

TABLE I  
Personal Fiber Exposures

| No.<br>81                     | POSITION<br>LOCATION<br>(DATE)                  | NAME/AREA      | ANALYSIS FOR         | TIME             | MIN. | RESULT<br>(f/cc) | TWA for<br>Sample<br>Period<br>(f/cc) | REMARKS                                                                                                                                                                |
|-------------------------------|-------------------------------------------------|----------------|----------------------|------------------|------|------------------|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Manufacturing Department      |                                                 |                |                      |                  |      |                  |                                       |                                                                                                                                                                        |
| 001                           | Mixer<br>Operator<br>(3/23/81)                  | S. Minio       | Fibers<br>(Asbestos) | 6:40a<br>9:18a   | 158  | 1.7              |                                       | Cleaned out vacuums on second floor during this sample                                                                                                                 |
| 002                           |                                                 |                |                      | 9:18a<br>1:04p   | 226  | 0.25             | 0.71                                  | Manufactured 10" 3300 & 12" 2400 pipe. 8 dumps made this day (27.5% of Fiber Crocidolite)                                                                              |
| 003                           |                                                 |                |                      | 1:04p<br>3:37p   | 153  | 0.35             |                                       | Employee wore 3M 8710 Respirator                                                                                                                                       |
| 004                           | Mixer<br>Operator<br>(3/24/81)                  | S. Minio       | Fibers<br>(Asbestos) | 7:15a<br>7:44a   | 29   | 0.28             | --                                    | Manufacturing 10" & 12" 2400 1 dump made. (30.8% of Fiber Crocidolite) Employee wore 3M 8710 Respirator                                                                |
| 005                           | Press<br>Operator<br>(3/23/81)                  | C. Worthington | Fibers<br>(Asbestos) | 6:33a<br>9:16a   | 163  | 0.67             |                                       | Manufacturing 10" 3300 & 12" 2400 pipe. Felts: Top-77 hours Bottom-new. No down time                                                                                   |
| 006                           |                                                 |                |                      | 9:16a<br>1:02p   | 226  | >3.1*            | >3.1*                                 |                                                                                                                                                                        |
| 007                           |                                                 |                |                      | 1:02p<br>3:41p   | 159  | >5.7*            |                                       | Wall/panel installed at approx. 3pm Employee wore 3M 8710 Respirator                                                                                                   |
| 008                           | Press<br>Operator<br>(3/24/81)                  | C. Worthington | Fibers<br>(Asbestos) | 7:47a<br>10:42a  | 175  | >5.0*            | --                                    | Manufacturing 10" & 12" 2400 pipe. Felts: Top-87 hours Bottom-10 hours. Wall/panel installed for this sample. Employee 20 min. break. Employee wore 3M 8710 Respirator |
| 009                           | Mandrel<br>Handler<br>(3/23/81)                 | J. Mascola     | Fibers<br>(Asbestos) | 6:42a<br>1:05p   | 383  | >0.86*           | 0.81                                  | Manufacturing 10" 3300 & 12" 2400 pipe. No down time.                                                                                                                  |
| 010                           |                                                 |                |                      | 1:05p<br>3:51p   | 166  | 0.68             |                                       |                                                                                                                                                                        |
| Finishing/Fittings Department |                                                 |                |                      |                  |      |                  |                                       |                                                                                                                                                                        |
| 011                           | Line #3<br>Lathe<br>(west<br>side)<br>(3/23/81) | A. DeClerico   | Fibers<br>(Asbestos) | 6:11a<br>9:00a   | 169  | --               |                                       | Void sample - pump problems                                                                                                                                            |
| 012                           |                                                 |                |                      | 9:00a<br>10:18a  | 78   | --               | 0.15                                  | Void sample - pump problems                                                                                                                                            |
| 013                           |                                                 |                |                      | 10:18a<br>12:00m | 102  | 0.26             |                                       | Finishing 21" 4000 & 5000 pipe and 21" 5000 1/2 MEO's.                                                                                                                 |
| 014                           |                                                 |                |                      | 12:32p<br>4:05p  | 213  | 0.099            |                                       | Cleanup 1:10 - 1:20p                                                                                                                                                   |

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\* NOTE: (>) - GREATER THAN - Sample was heavily loaded with particulate, fibers were obscured making fiber analysis difficult.

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TABLE I (cont.)  
Personal Fiber Exposures

| No.<br>81 | POSITION<br>LOCATION<br>(DATE)                              | NAME/AREA    | ANALYSIS FOR         | TIME            | MIN. | RESULT<br>(f/cc) | TWA for<br>Sample<br>Period<br>(f/cc) | REMARKS                                                                                                       |
|-----------|-------------------------------------------------------------|--------------|----------------------|-----------------|------|------------------|---------------------------------------|---------------------------------------------------------------------------------------------------------------|
| 015       | Line #3<br>Lathe<br>Operator<br>(West<br>side)<br>(3/24/81) | A. DeClerico | Fibers<br>(Asbestos) | 12:55p<br>3:00p | 125  | 0.098            |                                       | Changes made to dust collec-<br>tion system.<br>Finishing 18" 3300-5000 pipe<br>and 18" 5000 1/2 MEO's.       |
| 016       | Line #3<br>Lathe<br>Helper<br>(East<br>side)<br>(3/23/81)   | F. Talese    | Fibers<br>(Asbestos) | 6:13a<br>9:01a  | 168  | 0.061            |                                       | Finishing 21" 4000 & 5000 pipe<br>and 21" 5000 1/2 MEO's.                                                     |
| 017       |                                                             |              |                      | 9:01a<br>12:00n | 179  | 0.15             | 0.15                                  |                                                                                                               |
| 018       |                                                             |              |                      | 12:34p<br>1:21p | 47   | 0.25             |                                       | Clean-up 1:10 - 1:20p                                                                                         |
| 019       |                                                             |              |                      | 1:21p<br>4:03p  | 162  | 0.20             |                                       |                                                                                                               |
| 020       | Line #3<br>Lathe<br>Helper<br>(East<br>side)<br>(3/24/81)   | F. Talese    | Fibers<br>(Asbestos) | 12:54p<br>3:00p | 126  | 0.25             |                                       | Finishing 18" 3300-5000 pipe<br>and 18" 5000 1/2 MEO's.<br>Changes made to dust collect<br>collection system. |
| 021       | Line #3<br>Inspector<br>(3/23/81)                           | A. Camasso   | Fibers<br>(Asbestos) | 6:25a<br>9:04a  | 159  | 0.18             | 0.11                                  | Finishing 21" 4000-5000 pipe<br>and 21" 5000 1/2 MEO's.                                                       |
| 022       |                                                             |              |                      | 9:04a<br>10:47a | 103  | 0.047            |                                       |                                                                                                               |
| 023       |                                                             |              |                      | 10:47a<br>4:03p | 316  | 0.10             |                                       |                                                                                                               |
| 024       | Line #3<br>Tester<br>Operator<br>(3/23/81)                  | G. Bojaciuk  | Fibers<br>(Asbestos) | 6:14a<br>9:02a  | 168  | 0.34             |                                       | Finishing 21" 4000-5000 pipe<br>and 21" 5000 1/2 MEO's.                                                       |
| 025       |                                                             |              |                      | 9:02a<br>12:56p | 234  | 0.27             | 0.26                                  |                                                                                                               |
| 026       |                                                             |              |                      | 12:56p<br>1:22p | 26   | 0.27             |                                       |                                                                                                               |
| 027       |                                                             |              |                      | 1:22p<br>4:02p  | 160  | 0.15             |                                       |                                                                                                               |

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TABLE 1 (cont.)  
Personal Fiber Exposures

| No.<br>81 | POSITION<br>LOCATION<br>(DATE)                        | NAME/AREA      | ANALYSIS FOR         | TIME            | MIN. | RESULT<br>(f/cc) | TWA for<br>Sample<br>Period | REMARKS                                  |
|-----------|-------------------------------------------------------|----------------|----------------------|-----------------|------|------------------|-----------------------------|------------------------------------------|
| 028       | Line #3<br>Beller<br>(West<br>side)                   | J. Lucas       | Fibers<br>(Asbestos) | 6:20a<br>8:58a  | 158  | 0.30             |                             | Belling 21" 4000-5000 pipe               |
| 029       | (3/23/81)                                             |                |                      | 8:58a<br>12:01p | 183  | 0.24             | 0.23                        |                                          |
| 030       |                                                       |                |                      | 12:35p<br>4:02p | 207  | 0.18             |                             |                                          |
| 031       | Boring<br>Mill #15<br>Operator<br>(3/24/81)           | F. Maríncola   | Fibers<br>(Asbestos) | 6:15a<br>10:30a | 255  | 0.47             |                             | 8" 150 couplings                         |
| 032       |                                                       |                |                      | 10:30a<br>3:14p | 284  | 0.30             | 0.36                        |                                          |
| 033       |                                                       |                |                      | 3:14p<br>4:09p  | 55   | 0.17             |                             |                                          |
| 034       | Boring<br>Mill #54<br>Operator<br>(3/24/81)           | C. Handschin   | Fibers<br>(Asbestos) | 6:02a<br>10:29a | 267  | 0.12             |                             | Boring 18" 3300-5000 AND 21" 5000 cplgs. |
| 035       |                                                       |                |                      | 10:29a          | -    | -                | 0.13                        | Void sample                              |
| 036       |                                                       |                |                      | 10:29a<br>3:13p | 284  | 0.16             |                             |                                          |
| 037       |                                                       |                |                      | 3:13p<br>4:09p  | 56   | 0.067            |                             |                                          |
| 038       | Rework<br>Saw/Korit<br>Drill<br>Operator<br>(3/23/81) | E. Enchavarria | Fibers<br>(Asbestos) | 6:15a<br>7:04a  | 49   | 0.30             |                             | Operating Rework Saw 12" pipe            |
| 039       |                                                       |                |                      | 7:10a<br>10:32a | 202  | 0.37             | 0.33                        | Operating Korit Drill making 8 x 4 Wyes. |
| 040       |                                                       |                |                      | 10:32a<br>1:11p | 159  | 0.36             |                             |                                          |
| 041       |                                                       |                |                      | 1:11p<br>3:58p  | 167  | 0.25             |                             | Employee wore 3M 8710 Respirator         |
| 042       | Pencil<br>Sharpener<br>Operator<br>(3/24/81)          | D. Rodríguez   | Fibers<br>(Asbestos) | 8:41a<br>10:50a | 129  | 0.34             | 0.31                        | Operating Pencil Sharpener 8" 1/4's.     |
| 043       |                                                       |                |                      | 10:50a<br>4:00p | 310  | 0.30             |                             | Putting rings in 18" couplings           |

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TABLE I (cont.)  
Personal Fiber Exposures

| No.<br>81 | POSITION<br>LOCATION<br>(DATE)           | NAME/AREA   | ANALYSIS FOR         | TIME             | MIN. | RESULT<br>(f/cc) | TWA for<br>Sample<br>Period | REMARKS                               |
|-----------|------------------------------------------|-------------|----------------------|------------------|------|------------------|-----------------------------|---------------------------------------|
| 044       | Wet Saw<br>Operator<br>(3/24/81)         | J. Reynolds | Fibers<br>(Asbestos) | 6:21a<br>10:36a  | 254  | 0.27             |                             | Cutting 18" 1/4 lengths.              |
| 045       |                                          |             |                      | 10:36a<br>11:56a | 80   | 0.28             | 0.31                        |                                       |
| 046       |                                          |             |                      | 12:31p<br>3:28p  | 177  | 0.39             |                             | Employee wore 3M 8710<br>Respirator   |
| 047       | Wet Saw<br>Helper<br>(3/24/81)           | L. DiAmico  | Fibers<br>(Asbestos) | 6:21a<br>10:35a  | 254  | 0.21             |                             | Cutting 18" 1/4 lengths.              |
| 048       |                                          |             |                      | 10:35a<br>12:35p | 120  | 0.23             | 0.21                        |                                       |
| 049       |                                          |             |                      | 12:35p<br>3:17p  | 162  | 0.18             |                             | Employee wore 3M 8710<br>Respirator   |
| 050       | Lehman<br>Lathe<br>Operator<br>(3/23/81) | B. Barnett  | Fibers<br>(Asbestos) | 6:45a<br>9:09a   | 144  | 0.43             |                             | 21" 5000 sewer 1/4 lengths            |
| 051       |                                          |             |                      | 9:09a<br>1:10p   | 241  | 0.21             | 0.35                        |                                       |
| 052       |                                          |             |                      | 1:10p<br>4:15p   | 185  | 0.47             |                             |                                       |
| 053       | Nebel<br>Lathe<br>Operator<br>(3/24/81)  | J. DeSilva  | Fibers<br>(Asbestos) | 6:01a<br>10:28a  | 267  | 0.11             | 0.10                        | Making 10" 200 PAD 3's.               |
| 054       |                                          |             |                      | 10:28a<br>3:47p  | 319  | 0.083            |                             |                                       |
| 055       | Tool<br>Grinder<br>(3/24/81)             | F. DeTuro   | Fibers<br>(Asbestos) | 8:14a<br>10:10a  | 116  | 0.14             |                             | Unloading & stacking 10"<br>couplings |

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TABLE 11  
Area/Environmental Fiber Samples

| No.<br>81 | POSITION<br>LOCATION<br>(DATE)                         | NAME/AREA | ANALYSIS FOR         | TIME            | MIN. | RESULT<br>(f/cc) | REMARKS                                                                                                      |
|-----------|--------------------------------------------------------|-----------|----------------------|-----------------|------|------------------|--------------------------------------------------------------------------------------------------------------|
| 056       | Bag Opener<br>(3/24/81)                                | Area      | Fibers<br>(Asbestos) | 7:15a<br>7:44a  | 29   | 0.21             | Setting at Bag Opener on Bag compactor while opener <u>was</u> in operation, making a dump.                  |
| 057       | Bag Opener<br>(3/24/81)                                | Area      | Fibers<br>(Asbestos) | 2:30p<br>2:55p  | 25   | <0.018**         | Setting at Bag Opener on Bag compactor while opener <u>was not</u> in operation.                             |
| 058       | Pipe Machine<br>Rollup<br>(3/24/81)                    | Area      | Fibers<br>(Asbestos) | 7:48a<br>10:41a | 173  | >3.06*           | Pump hanging at pipe machine roll-up/press section 5' from floor, 4' from press section, 5' from operator.   |
| 059       | Pipe Machine<br>console/<br>control panel<br>(3/24/81) | Area      | Fibers<br>(Asbestos) | 7:50a<br>10:41a | 171  | 1.71             | Pump setting on console 5' from floor, 15' from press section, 10' behind operator.                          |
| 060       | Crusher<br>(3/24/81)                                   | Area      | Fibers<br>(Asbestos) | 7:54a<br>10:34a | 164  | >3.91*           | Pump hanging 4' from floor near control panel. Not crushing but dust collector dust running through cyclone. |

\* NOTE: (>) - GREATER THAN - Sample was heavily loaded with particulate, fibers were obscured making fiber analysis difficult.

\*\* NOTE: (<) - LESS THAN - Fiber concentration on filter found to be less than the average fiber concentration of blank filters.

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TABLE III  
Audiotosimetry Results

| No.<br>81                | POSITION<br>LOCATION<br>(DATE)            | NAME/AREA      | TIME           | MIN. | RESULTS                 |        | REMARKS                                                 |
|--------------------------|-------------------------------------------|----------------|----------------|------|-------------------------|--------|---------------------------------------------------------|
|                          |                                           |                |                |      | Eight Hour<br>Dosimeter |        |                                                         |
|                          |                                           |                |                |      | 85 dBA                  | 90 dBA |                                                         |
| Manufacturing Department |                                           |                |                |      |                         |        |                                                         |
| 061                      | Mandrel<br>Handler<br>(3/23/81)           | J. Mascola     | 7:20a<br>3:51p | 511  | 103%                    |        | Manufacturing 10" 3300 &<br>12" 2400 pipe               |
| 062                      | Tray Loader<br>(3/24/81)                  | J. Carey       | 8:45a<br>4:00p | 435  | 54%                     |        | No mandrel change made                                  |
| 063                      | Utility Truck<br>Driver<br>(3/23/81)      | T. Rowan       | 7:25a<br>3:57p | 512  | 117%                    |        | No mandrel change made                                  |
| Finishing Department     |                                           |                |                |      |                         |        |                                                         |
| 064                      | Line #3<br>Lathe<br>Operator<br>(3/23/81) | A. DeClerico   | 7:15a<br>4:05p | 530  | 206%                    |        | Finishing 21" 4000-5000 pipe<br>AND 21" 5000 1/2 MEO's. |
| 065                      | Line #3<br>Lathe Helper<br>(3/23/81)      | F. Talese      | 7:15a<br>4:03p | 528  | 229%                    |        | Finishing 21" 4000-5000 pipe<br>AND 21" 5000 1/2 MEO's. |
| 066                      | Wet Saw<br>Operator<br>(3/24/81)          | J. Reynolds    | 6:21a<br>3:28p | 547  | 171%                    |        | Cutting 18" 1/4 lengths.<br>Employee wore E.A.R. Plugs  |
| 067                      | Wet Saw<br>Helper<br>(3/23/81)            | L. DeMico      | 7:06a<br>3:57p | 531  | 63%                     |        | Cutting 18" 1/4 lengths.<br>Employee wore ear muffs     |
| 068                      | Korit Drill<br>Operator<br>(3/24/81)      | A. Enchavarria | 6:30a<br>4:00p | 570  | 102%                    |        | Making 8 x 4 wyes                                       |
| 069                      | Lehman Lathe<br>Operator<br>(3/23/81)     | B. Barnett     | 6:45a<br>4:15p | 570  | 113%                    |        | 21" 5000 sewer 1/4 lengths                              |
| 070                      | Finishing<br>Truck Driver<br>(3/24/81)    | S. Wright      | 6:39a<br>4:05p | 566  | 62%                     |        |                                                         |
| 071                      | Sweeper<br>Operator<br>(3/24/81)          | H. Dukes       | 6:00a<br>4:09p | 609  | 42%                     |        | On sweeper throughout day.                              |
| Maintenance Department   |                                           |                |                |      |                         |        |                                                         |
| 072                      | Boiler<br>Operator<br>(3/24/81)           | L. Dukes       | 8:48a<br>4:12p | 444  | 89%                     |        |                                                         |
| CTD019536                |                                           |                |                |      |                         |        |                                                         |

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Ambler A/C Pipe Plant  
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TABLE IV  
Personal Fiber Exposures

| No. | POSITION<br>LOCATION<br>(DATE)  | NAME/AREA      | ANALYSIS FOR         | TIME            | MIN | RESULT<br>f/cc | TWA FOR<br>SAMPLE<br>PERIOD | REMARKS                                              |
|-----|---------------------------------|----------------|----------------------|-----------------|-----|----------------|-----------------------------|------------------------------------------------------|
| 073 | Press<br>Operator<br>(5/5/81)   | C. Worthington | Fibers<br>(Asbestos) | 6:30a<br>8:54a  | 144 | 0.78           |                             | Manufacturing 12"<br>150 pipe 9 3/4 ton<br>per hour. |
| 074 |                                 |                |                      | 8:54a<br>1:01p  | 247 | 0.27           | 0.45                        | Felt hours-<br>Top: 44<br>Bottom: 31 1/2             |
| 075 |                                 |                |                      | 1:01p<br>2:00p  | 59  | 0.39           |                             |                                                      |
| 076 | Mandrel<br>Handler<br>(5/5/81)  | J. Mascola     | Fibers<br>(Asbestos) | 6:42a<br>9:03a  | 143 | 0.072          | 0.049<br><del>0.49</del>    | Manufacturing 12"<br>150 pipe 9 3/4 ton<br>per hour. |
| 077 |                                 |                |                      | 9:05a<br>1:50p  | 285 | 0.038          |                             | Felt hours-<br>Top: 44<br>Bottom: 31 1/2             |
| 078 | Crusher<br>Operator<br>(5/5/81) | H. Dukes       | Fibers<br>(Asbestos) | 6:52a<br>8:59a  | 127 | 1.16           | 0.69                        | Worked entire day<br>at crusher.                     |
| 079 |                                 |                |                      | 8:59a<br>12:02p | 183 | 0.37           |                             |                                                      |
| 080 |                                 |                |                      | 12:40p<br>4:00p | 200 | -              | -                           | Void Sample-<br>pump problems.                       |

TABLE V  
Area/Environmental/Engineering Fiber Samples

| No. | POSITION<br>LOCATION<br>(DATE)           | NAME/AREA | ANALYSIS FOR         | TIME            | MIN | RESULT<br>f/cc | TWA FOR<br>SAMPLE<br>PERIOD | REMARKS                                                                                                                  |
|-----|------------------------------------------|-----------|----------------------|-----------------|-----|----------------|-----------------------------|--------------------------------------------------------------------------------------------------------------------------|
| 081 | Mixing<br>Area<br>(5/5/81)               | Area      | Fibers<br>(Asbestos) | 5:14a<br>6:06a  | 52  | 0.20           | --                          | Pump hanging on 1<br>beam 15' from<br>mixing pot 6' from<br>floor. Before start<br>up.                                   |
| 082 |                                          |           |                      | 6:06a<br>8:56a  | 170 | 0.11           |                             |                                                                                                                          |
| 083 | Area near<br>Tailing pumps<br>(5/5/81)   | Area      | Fibers<br>(Asbestos) | 7:03a<br>9:03a  | 120 | 0.056          | --                          | Pump hanging 5'<br>from floor 5' from<br>pipe machine                                                                    |
| 084 |                                          |           |                      | 9:03a<br>12:59p | 236 | 0.041          |                             |                                                                                                                          |
| 085 |                                          |           |                      | 1:05p<br>4:25p  | 200 | 0.037          |                             |                                                                                                                          |
| 086 | Area at<br>Mandrel<br>Return<br>(5/5/81) | Area      | Fibers<br>(Asbestos) | 5:12a<br>6:07p  | 55  | 0.020          | --                          | Pump hanging 15'<br>from Tailing pump<br>5' from Mandrel<br>return. Before<br>start up                                   |
| 087 |                                          |           |                      | 6:07a<br>9:04a  | 177 | 0.028          |                             |                                                                                                                          |
| 088 |                                          |           |                      | 9:04a<br>12:59p | 235 | 0.033          |                             |                                                                                                                          |
| 089 | Rollup<br>(5/5/81)                       | Area      | Fibers<br>(Asbestos) | 6:46            | --  | --             | --                          | VOID SAMPLE                                                                                                              |
| 090 |                                          |           |                      | 6:47a<br>8:52a  | 125 | 1.32           |                             | Pump hanging at<br>pipe machine roll-<br>up/press section 5'<br>from floor 4' from<br>press section 5'<br>from operator. |
| 091 |                                          |           |                      | 8:52a<br>1:02p  | 250 | >0.57          |                             |                                                                                                                          |
| 092 |                                          |           |                      | 1:02p<br>4:25p  | 203 | >0.16          |                             |                                                                                                                          |
| 093 | Console<br>(5/5/81)                      | Area      | Fibers<br>(Asbestos) | 5:10a<br>6:06a  | 54  | 0.07           |                             | Before start up                                                                                                          |
| 094 |                                          |           |                      | 6:06a<br>8:53a  | 167 | 0.22           | --                          | Pump setting on<br>console 5' from<br>floor 15' from<br>press section 10'<br>behind operator.                            |
| 095 |                                          |           |                      | 8:53a<br>12:59p | 246 | 0.10           |                             |                                                                                                                          |
| 096 |                                          |           |                      | 12:59p<br>4:25p | 206 | 0.17           |                             |                                                                                                                          |

Industrial Hygiene Survey  
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TABLE V (cont.)  
Area/Environmental/Engineering Fiber Samples

| No. | POSITION<br>LOCATION<br>(DATE)                                  | NAME/AREA                  | ANALYSIS FOR         | TIME             | MIN | RESULT<br>f/cc | TWA FOR<br>SAMPLE<br>PERIOD | REMARKS                                                                                   |
|-----|-----------------------------------------------------------------|----------------------------|----------------------|------------------|-----|----------------|-----------------------------|-------------------------------------------------------------------------------------------|
| 097 | 2nd Floor<br>(5/5/81)                                           | Area                       | Fibers<br>(Asbestos) | 9:08<br>12:57    | 229 | 0.22           | --                          | Pump 5' from floor<br>#1 mixer above<br>screw conveyor                                    |
| 098 | Mfg. Dept.<br>Fire Hose<br>(5/5/81)                             | Area                       | Fibers<br>(Asbestos) | 6:45a<br>8:57a   | 132 | 0.26           | --                          | Pump hanging 4'<br>from floor at fire<br>hose bracket at<br>door to locker room           |
| 099 |                                                                 |                            |                      | 8:57a<br>3:18p   | 381 | 0.10           |                             |                                                                                           |
| 100 | Aisle near<br>Crusher<br>(5/5/81)                               | Area                       | Fibers<br>(Asbestos) | 5:08a<br>6:16a   | 68  | 0.015          | --                          | Before start up                                                                           |
| 101 |                                                                 |                            |                      | 6:16a<br>8:57a   | 161 | 0.18           |                             | Pump setting 10'<br>from corner of<br>crusher area 30'<br>from crusher                    |
| 102 |                                                                 |                            |                      | 8:57a<br>3:18p   | 381 | 0.087          |                             |                                                                                           |
| 103 | Crusher<br>near Aisle<br>(5/5/81)                               | Area                       | Fibers<br>(Asbestos) | 6:55a<br>8:58a   | 123 | 2.89           | --                          | Pump hanging above<br>motor 4' from floor<br>near control panel<br>2 hoppers dumped       |
| 104 |                                                                 |                            |                      | 8:58a<br>11:41a  | 163 | 0.54           |                             |                                                                                           |
| 105 |                                                                 |                            |                      | 12:03p<br>12:33p | 30  | 0.65           |                             | Shaking bags in<br>dust collector                                                         |
| 106 |                                                                 |                            |                      | 12:40p<br>2:18p  | 98  | 0.65           |                             | No hoppers dumped                                                                         |
| 107 |                                                                 |                            |                      | 2:18p<br>4:00p   | 102 | 0.45           |                             | Started cleanup<br>3:10                                                                   |
| 108 | Crusher near<br>wall<br>(5/5/81)                                | Area                       | Fibers<br>(Asbestos) | 6:54a<br>8:59a   | 125 | 2.15           | --                          | Pump hanging 5'<br>from floor 3' from<br>wall above goods<br>on floor<br>2 hoppers dumped |
| 109 |                                                                 |                            |                      | 8:59a<br>12:03p  | 184 | 0.99           |                             |                                                                                           |
| 110 |                                                                 |                            |                      | 12:03p<br>12:33p | 30  | 1.07           |                             | Shaking bags in<br>dust collector                                                         |
| 111 |                                                                 |                            |                      | 12:40p<br>2:18p  | 98  | 1.56           |                             | No hoppers dumped                                                                         |
| 112 |                                                                 |                            |                      | 2:18p<br>4:00p   | 82  | 0.098          |                             | Started cleanup<br>3:10                                                                   |
| 113 | At crusher<br>Above Rotary<br>Valve Exhaust<br>Bags<br>(5/5/81) | Engineering -<br>at source | Fibers<br>(Asbestos) | 12:02p<br>12:33p | 31  | 2.79           | --                          | Shaking dust<br>collector bags<br>Visible dust<br>released at Bags.                       |

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TABLE VI  
Ambler A/C Pipe Plant  
Dec. 79/Jan 80 Survey Results Compared to March/May 81 Survey

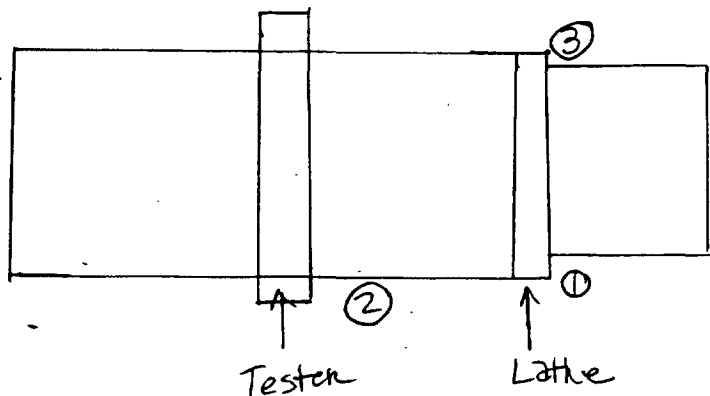
| Department    | No. Samples |           | Mean<br>(f/cc) |      | Percent<br>>2.0 f/cc |      | Percent<br>>0.5 f/cc |      | Percent<br>>0.1 f/cc |      |
|---------------|-------------|-----------|----------------|------|----------------------|------|----------------------|------|----------------------|------|
|               | 1/80        | 5/81      | 1/80           | 5/81 | 1/80                 | 5/81 | 1/80                 | 5/81 | 1/80                 | 5/81 |
| Manufacturing | 66          | 30        | 1.3            | 0.44 | 17                   | 3    | 76                   | 17   | 100                  | 60   |
| Finishing     | 79          | 42        | 0.69           | 0.25 | 5                    | 0    | 47                   | 2    | 100                  | 86   |
| Crusher       | <u>14</u>   | <u>16</u> | 3.02           | 0.98 | 50                   | 19   | 93                   | 63   | 100                  | 81   |
| Plant         | 159         | 88*       | 1.17           | 0.45 | 13                   | 5    | 62                   | 18   | 100                  | 76   |

\* A total of 101 samples were taken during the March & May '81 survey. 5 were voided due to problems in the field, and 8 from the March survey were not included in this table because engineering work was completed and the samples were redone in May and found to have lower levels.

|             |       |                      |                 |
|-------------|-------|----------------------|-----------------|
| MICROPHONE: | B & K | PROTECTOR:           |                 |
| CALIBRATOR: | B & K | CALIBRATION<br>DATE: | BEFORE<br>AFTER |

**SKETCH - REMARKS**

\* end of cycle no more pipe



CTD019542

APPENDIX I  
Monitoring/Analytical Procedures  
and  
Current Standards

Asbestos

Personal samples, Area samples which reflect employee exposure levels, and Area/Environmental/Engineering samples were obtained on Millipore 0.8 micrometer Mixed Cellulose Ester Filters (MCEF). DuPont P4000 air sampling pumps were calibrated before and after each sampling day to approximately 2 liters per minute (lpm). In most cases, a series of 3 or 4 different filter samples were obtained for the person or area to establish an eight hour time weighted average concentration (TWA).

The analysis was conducted according to the USPHS/NIOSH Membrane Filter Method for Evaluating Airborne Asbestos Fibers (P&CAM 239) by an experienced fiber counter who was trained by NIOSH. Fibers were counted on a Nikon Model 96982 phase contrast microscope at 400X magnification.

The current OSHA standard is given in 29 CFR 1910.1001. It calls for an employee TWA airborne limit of two fibers, longer than 5 micrometers, per cubic centimeter of air (f/cc). Also, no employee shall be exposed at any time to airborne concentrations in excess of 10 f/cc.

Noise

A Bruel & Kjaer 2209 precision sound level meter with B&K 4133 1/2 inch microphone was utilized to obtain sound pressure level measurements. This instrument was calibrated before and after this survey. The reference for all sound pressure level measurements is 0.0002 microbar.

DuPont Model D-376 audiodosimeters were also utilized during this survey and were set at the 85 dB cutoff mode. The audiodosimeters were calibrated before and after each day of dosimetry sampling utilizing the DuPont Audiodosimeter Calibrator Model C114 by the direct reading method. Before and after each survey week the audiodosimeters were calibrated by the timed calibration procedure utilizing the DuPont calibrator C114 and the Model R225 readout. This calibration was done for 5 minutes, 10 seconds at 114 dB to give an expected 30% +/- 4% result.

The Permissible noise exposure given in OSHA 29 CFR 1910.95, ranges between 90 decibels for 8-hours per day through 115 decibels for a maximum duration of 1/4 hour per day according to the table below. Also, exposure to impulsive or impact noise should not exceed the 140 decibel peak sound pressure level ceiling value. The maximum permissible audiodosimeter dose is 100%.

CTD019543

## APPENDIX II

KEY ELEMENTS OF A RESPIRATOR PROGRAM

The Occupational Safety and Health Administration (OSHA) provides regulations for the use of respirators in OSHA standard, 29 CFR 1910.134. OSHA indicates that harmful levels of atmospheric contamination of dusts, fogs, fumes, mists, gases, smokes, sprays and vapors shall be prevented as far as feasible by accepted engineering controls. When effective engineering controls are not feasible or when they are being instituted, appropriate respirators are to be used. It is required that employers provide respirators which are applicable and suitable for the purpose intended. The employer is responsible for the establishment and maintenance of a respiratory protective program which includes the following eleven items.

1. Written Operating Procedures. The respirator procedures must be written and should address the selection and use of respirators. The location's procedures for items 2 through 11 should be discussed and explained in detail. Responsibilities for specific aspects of the program should also be specified in the location's written respirator program.
2. Proper Selection. The selection of the appropriate respirator is based on the physical state of the substance (gas, vapor, particulate, etc...) the warning properties of the chemical, the toxicity of the agent involved, the protection factor of the respiratory device, and the airborne level of the agent. Other factors to be considered include permissible exposure levels, oxygen deficiency, and approved equipment.
3. Training and Fitting for the Employees. It is required that employees are instructed and trained in the proper use, limitations, selection, and maintenance of respirators. Employees should be trained in the nature of the hazard. The employee must be trained to check the fit of the respirator each time it is used.

Fitting through the use of quantitative fit testing (isoamyl acetate or irritant smoke) is also required.

4. Exclusive Employee Use. Where practicable, the respirators should be assigned to individual workers for their exclusive use.
5. Cleaning and Disinfecting. Respirators are to be regularly cleaned and disinfected. This must be done thoroughly after each use for respirators used by more than one worker. For respirators assigned to one worker, respirators must be cleaned and disinfected daily when they are routinely used throughout the day.
6. Storage. Respirators shall be stored in a convenient, clean, and sanitary location. It is especially important that rubber parts are stored so that they do not lose their original shape. A misshapen mask is essentially broken and no longer holds its approval.

Industrial Hygiene Survey  
 Appendix II  
 Key Elements of a Respirator Program

7. Inspection and Maintenance. Respirators used routinely must be inspected during cleaning. Worn or deteriorated parts must be replaced.

Respirators for emergency use such as self-contained devices shall be thoroughly inspected at least once a month and after each use.

8. Work AREA Surveillance. Appropriate surveillance of work area conditions and degree of employee exposure shall be maintained.

It is necessary to review the work area to identify contaminants and assess the degree of hazard on a regular basis.

9. Inspection and Evaluation of the Program. Regular inspections are required to insure that respirators are properly selected, used, cleaned, and maintained.

10. Medical Examination. OSHA indicates that an employee should not be required to use a respirator unless a physician has determined that the employee is physically able to perform the work and use the equipment. The respirator user's medical status should be reviewed periodically.

11. Approved Respirators. Approved (NIOSH/MSHA) respirators are to be used when they are available. The approvals on respirators apply to the respirators as whole units. The approval is valid for the whole unit in good condition. It is nullified by the mixing of components and by use of non-approved components.

This is a condensed summary of the OSHA regulations on the use of respirators. Background information on respirators is given in the following sources:

A Guide to Industrial Respiratory Protection, John A. Pritchard, Los Alamos Scientific Laboratory, HEW Publication No. (NIOSH) 76-189, 1976.

Practices for Respiratory Protection, ANSI Z88.2, 1980, American Standards Institute, Inc., 1430 Broadway, NY, NY, 10018.

OSHA Standard Method for Determination of Respiratory Protection Program Acceptability, Industrial Hygiene Field Operations Manual, OSHA Instruction CPL 2-2.20, April 2, 1979, Office of Field Coordination.

/tmf

*Li-Val 280*

INDUSTRIAL HYGIENE SURVEY

Ambler A/C Pipe Plant  
March 23 & 24, 1981  
May 5, 1981

PPG

.81-10 AMBLER A/C  
3/23-24/81  
5/5/81

IHS