

**Gilsenan, Michael**

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**From:** Jeanine Prudhomme [jprudhom@health.nyc.gov]  
**Sent:** Monday, April 01, 2002 1:53 PM  
**To:** michaelgi@dep.nyc.gov  
**Subject:** Fwd: RE: draft screening levels for asbestos, FG and silica in indoor air and settled dust

More on the CAC Work Group for you and Penny. Thanks,

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RE: draft screening  
levels for...

## Gilsenan, Michael

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**From:** DeVoney, Danielle [dld7@cdc.gov]  
**Sent:** Monday, April 01, 2002 1:48 PM  
**To:** DeVoney, Danielle; 'Maddaloni.Mark@epamail.epa.gov'; 'grevatt.peter@epamail.epa.gov'; 'smith.terry@epamail.epa.gov'; Rodenbeck, Sven; 'rlc07@health.state.ny.us'; 'kcarlino@health.nyc.gov'; 'laposta.dore@epamail.epa.gov'; 'david.ippolito@osha.gov'; 'dan.crane@osha.gov'; 'njeffery@health.nyc.gov'; 'girman.john@epamail.epa.gov'; 'Schaum.John@epamail.epa.gov'; 'Randi J. Walker'; 'Patricia M. Fritz'  
**Cc:** 'Callahan.Kathy@epamail.epa.gov'; 'Salkie.Richard@epamail.epa.gov'; 'Rotola.Joe@epamail.epa.gov'; Cooper, Barbara; Lee, Carolyn V. (Virginia); Neurath, Sue; Wilder, Lynn  
**Subject:** RE: draft screening levels for asbestos, FG and silica in indoor air and settled dust



AsbScreenDr1April. AsbCalcs1April.xls  
 wpd

Hi -

I ran some quick calculations for risk combining air and dust numbers, and integrated them into a screening level table. this assumes protecting for a 1/10,000 risk for one year for the upper tier, and the same for 30 years in the lower tier.

This is a first attempt on risk number, different exposure assumptions, and K values would yield slightly different results. I'm providing this as a basis for discussion. If we like the approach we can refine the risk calculations appropriately. Also, I've used a K factor of  $1 \times 10^{-7}$  for "daily activity" - although this works well with the math, we may want to refine that number also.

thanks,  
 danielle

-----Original Message-----

**From:** DeVoney, Danielle  
**Sent:** Monday, April 01, 2002 11:58 AM  
**To:** 'Maddaloni.Mark@epamail.epa.gov'; grevatt.peter@epamail.epa.gov; smith.terry@epamail.epa.gov; Rodenbeck, Sven; rlc07@health.state.ny.us; kcarlino@health.nyc.gov; DeVoney, Danielle; laposta.dore@epamail.epa.gov; david.ippolito@osha.gov; dan.crane@osha.gov; njeffery@health.nyc.gov; girman.john@epamail.epa.gov; Schaum.John@epamail.epa.gov; Randi J. Walker; Patricia M. Fritz  
**Cc:** Callahan.Kathy@epamail.epa.gov; Salkie.Richard@epamail.epa.gov; Rotola.Joe@epamail.epa.gov  
**Subject:** draft screening levels for asbestos, FG and silica in indoor air and settled dust  
**Importance:** High

Hi -

Main points of discussion on these issues for today's call are outlined below. I've tried to identify the main technical issues, so we can reach consensus, or identify additional information we need to consider on each

point. I have included tiered screening values for fibrous glass which take into consideration both dust and air levels. There are two versions of these screening levels which take different approaches as outlined below. I thought this would be useful for the discussion.

1) Sampling methodology for fibers. The microvac technique seems to be the most well developed method. It is a written and approved ASTM method which would give us surface loading information.

2) Use of K factors, or other techniques to extrapolate from settled dust to air screening values.

Questions:

a) Does the group feel Millette's K factors are well enough supported to apply in this case?

b) What other options exist? (see "Dust Ideas 1 April.wpd" below)

c) Can K factors be applied to non-fibrous dust components?

3) What risk estimate should be used for asbestos screening values?

A straight 1 year continuous exposure scenario gives a screening values of 0.028 f/cc. However, if this is based on sampling during daily activity, it may underestimate due to episodic higher exposures.

Earlier screening level for this tier was set at 0.01 f/cc.

One option would be to use non-aggressive air sampling in conjunction with settled dust levels and modeling of activity based episodic exposures for a combined risk assessment.

4) Sampling methodology and screening values for silica. We are still working on determining a dust sampling method for silica. The sampling method should be defined prior to determining a screening value for these data.

**DRAFT COC Airborne Screening Levels**

April 1, 2002

Asbestos - all types taken together

| Level                                                                                                                                                                          | Recommended actions                                                                                                                                                                                                                                                                                                                                                                                                   | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Air level:</b><br>$> 0.01 \text{ f/cc} *$<br><br><b>Settled Dust level:</b><br>$> 100,000 \text{ f/cm}^2$                                                                   | <p>Evaluate the need to remove sensitive individuals from the environment</p> <p>Evaluate conditions in the area including representativeness of air samples, fibrous glass dust levels and loading.</p> <p>Take actions to reduce exposures.</p> <ul style="list-style-type: none"> <li>- clean area</li> <li>- resample</li> <li>- ongoing cleaning</li> </ul>                                                      | <p>Screening value in air set at a level where short term exposures (<math>\leq 1</math> year) may result in exposures which contribute to</p> <p>Settled dust threshold is to protect to at least a <math>1 \times 10^{-4}</math> risk estimate for a one year exposure. Air concentrations estimated for different activities using a K factors based on Millette's work on asbestos. Risk estimate is based on estimates of air levels, and duration of exposure for different activities. (<math>100,000 \text{ f/cm}^2</math> corresponds to a <math>3 \times 10^{-5}</math> risk for a one year exposure)</p>                                            |
| <b>Air level:</b><br>NYC background<br>$- 0.01 \text{ f/cc} *$<br><br><b>Or</b><br><br><b>Settled Dust level:</b><br>$10,000 \text{ f/cm}^2$<br>To<br>$100,000 \text{ f/cm}^2$ | <p>Evaluate conditions in the area including representativeness of air samples, fibrous glass dust levels and loading.</p> <p>If air samples were not taken, then appropriate air sampling should be conducted to determine if fiber levels are elevated.</p> <p>Take actions to reduce exposures.</p> <ul style="list-style-type: none"> <li>- clean area</li> <li>- resample</li> <li>- ongoing cleaning</li> </ul> | <p>For those areas where air levels would not warrant removal of sensitive individuals, but are above the <math>0.001 \text{ f/cc}</math>, continued cleaning and evaluation is prudent.</p> <p>Settled dust threshold is to protect to at least a <math>1 \times 10^{-4}</math> risk estimate for a 30 year exposure. Air concentrations estimated for different activities using a K factors based on Millette's work on asbestos. Risk estimate is based on estimates of air levels, and duration of exposure for different activities. (<math>10,000 \text{ f/cm}^2</math> corresponds to a <math>1 \times 10^{-4}</math> risk for a 30 year exposure)</p> |
| <b>Air level:</b><br><br>$\leq \text{NYC background}$<br><br><b>And</b><br><br><b>Settled Dust level:</b><br>$\leq \text{background}$<br>or $1000 \text{ f/cm}^2$              | No action required                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

\* Fibers with length  $> 5 \mu\text{m}$  with an aspect ratio  $\geq 3:1$ , as defined in the ACGIH TLV.

Air concentrations measured by PCM, NIOSH 7400, confirmed by SEM.

## Contribution to risk of various asbestos dust levels

Risk = Conc(f/cc) \* TWF \* Slope factor

TWF is weighting factor for partial exposure (less than 70 years, 24 hrs a day)

Slope factor of 0.23 f/cc used over a 70 year exposure

**Low Fiber loading 1000 f/cm2**

| Scenario          | Activity        | loading<br>f/cc | K factor | Air level | Years | days/year | hours/day | TWF      | Contribution to Risk |          |
|-------------------|-----------------|-----------------|----------|-----------|-------|-----------|-----------|----------|----------------------|----------|
| 1 Year exposure   |                 |                 |          |           |       |           |           |          |                      |          |
|                   | 1 Daily activit | 1000            | 1.0E-07  | 1.00E-04  | 1     | 350       | 24        | 0.013699 | 3.15E-07             |          |
|                   | 2 Cleaning      | 1000            | 1.0E-06  | 1.00E-03  | 1     | 50        | 2         | 0.000163 | 3.75E-08             | 3.53E-07 |
| 30 Years exposure |                 |                 |          |           |       |           |           |          |                      |          |
|                   | 1 Daily activit | 1000            | 1.0E-07  | 1.00E-04  | 30    | 350       | 24        | 0.410959 | 9.45E-06             |          |
|                   | 2 Cleaning      | 1000            | 1.0E-06  | 1.00E-03  | 30    | 50        | 2         | 0.004892 | 1.13E-06             | 1.06E-05 |
| 70 Years exposure |                 |                 |          |           |       |           |           |          |                      |          |
|                   | 1 Daily activit | 1000            | 1.0E-07  | 1.00E-04  | 70    | 350       | 24        | 0.958904 | 2.21E-05             |          |
|                   | 2 Cleaning      | 1000            | 1.0E-06  | 1.00E-03  | 70    | 50        | 2         | 0.011416 | 2.63E-06             | 2.47E-05 |

**Moderate Fiber loading, 10,000f/cm2**

| Scenario          | Activity        | loading<br>f/cc | K factor | Air level | Years | days/year | hours/day | TWF      | Contribution to Risk |          |
|-------------------|-----------------|-----------------|----------|-----------|-------|-----------|-----------|----------|----------------------|----------|
| 1 Year exposure   |                 |                 |          |           |       |           |           |          |                      |          |
|                   | 1 Daily activit | 10000           | 1.0E-07  | 1.00E-03  | 1     | 350       | 24        | 0.013699 | 3.15E-06             |          |
|                   | 2 Cleaning      | 10000           | 1.0E-06  | 1.00E-02  | 1     | 50        | 2         | 0.000163 | 3.75E-07             | 3.53E-06 |
| 30 Years exposure |                 |                 |          |           |       |           |           |          |                      |          |
|                   | 1 Daily activit | 10000           | 1.0E-07  | 1.00E-03  | 30    | 350       | 24        | 0.410959 | 9.45E-05             |          |
|                   | 2 Cleaning      | 10000           | 1.0E-06  | 1.00E-02  | 30    | 50        | 2         | 0.004892 | 1.13E-05             | 1.06E-04 |
| 70 Years exposure |                 |                 |          |           |       |           |           |          |                      |          |
|                   | 1 Daily activit | 10000           | 1.0E-07  | 1.00E-03  | 70    | 350       | 24        | 0.958904 | 2.21E-04             |          |
|                   | 2 Cleaning      | 10000           | 1.0E-06  | 1.00E-02  | 70    | 50        | 2         | 0.011416 | 2.63E-05             | 2.47E-04 |

**Higher fiber loading, 100,000 f/cm2**

| Scenario          | Activity       | loading<br>f/cc | K factor | Air level | Years | days/year | hours/day | TWF      | Contribution to Risk |          |
|-------------------|----------------|-----------------|----------|-----------|-------|-----------|-----------|----------|----------------------|----------|
| 1 Year exposure   |                |                 |          |           |       |           |           |          |                      |          |
|                   | 1 Daily activi | 100000          | 1.0E-07  | 1.00E-02  | 1     | 350       | 24        | 0.013699 | 3.15E-05             |          |
|                   | 2 Cleaning     | 100000          | 1.0E-06  | 1.00E-01  | 1     | 50        | 2         | 0.000163 | 3.75E-06             | 3.53E-05 |
| 30 Years exposure |                |                 |          |           |       |           |           |          |                      |          |
|                   | 1 Daily activi | 100000          | 1.0E-07  | 1.00E-02  | 30    | 350       | 24        | 0.410959 | 9.45E-04             |          |
|                   | 2 Cleaning     | 100000          | 1.0E-06  | 1.00E-01  | 30    | 50        | 2         | 0.004892 | 1.13E-04             | 1.06E-03 |
| 70 Years exposure |                |                 |          |           |       |           |           |          |                      |          |
|                   | 1 Daily activi | 100000          | 1.0E-07  | 1.00E-02  | 70    | 350       | 24        | 0.958904 | 2.21E-03             |          |
|                   | 2 Cleaning     | 100000          | 1.0E-06  | 1.00E-01  | 70    | 50        | 2         | 0.011416 | 2.63E-04             | 2.47E-03 |