

U.S. Department of Health and Human Services  
Public Health Service  
Agency for Toxic Substances and Disease Registry  
Division of Health Assessment and Consultation  
Atlanta, Georgia 30333

In Reference To: **Health Consultation, BoRit Asbestos Air Sampling Results from 2006-2007**

Response Date: September 30, 2008

Submitted To: Lora Werner, MPH

Submitted By: Health, Environment, Risk & Safety (HERS) Working Group of the BoRit Asbestos Area Community Advisory Group (CAG)

## **Introduction:**

The Health, Environment, Risk & Safety (HERS) Working Group of the BoRit Asbestos Area Community Advisory Group, upon review of the ATSDR document, respectfully submits our response to the Health Consultation pertaining to BoRit Asbestos Air Sampling Results from 2006-2007.

Overall, we appreciate the substantial involvement of the ATSDR in our Community Advisory Group, as well as the outreach to the general community. The concern for our community is clearly reflected in the Health Consultation document. In particular, our group takes notice that ATSDR discusses the following risks in the executive summary: 1) airborne asbestos levels were increased with activity-based sampling; 2) on-site exposures with disturbance of soil or asbestos-containing material are a public health hazard; 3) drought or severely dry conditions could cause exacerbated airborne asbestos levels. The precautionary measures recommended by ATSDR seem prudent to our participants given the large-scale nature of this unremediated asbestos waste site in our community.

At present, the main area of conclusion that we cannot accept within the Health Consultation document involves the calculation of cancer risk assessment for individuals exposed to onsite conditions. In particular, we remain circumspect about the potential for increased cancer risk, even when there is no soil disturbance, during commonly encountered conditions at the site. We are actively approaching the topic with a mission to become well-informed community members with a cautious attitude toward making decisions that involve our own health and the health of our community members. Over time, we hope that a clearer and more definitive picture will emerge with regard to the unanswered questions that surround the calculation of cancer risk assessment. The following areas of concern represent certain issues that comprise our reluctance to fully accept the safety analysis.

## **Areas of Concern:**

### **1. Limitations of sampling conditions**

EPA collected air samples in and around the BoRit Asbestos Site from October 2006 until September 2007. These tests were intended to reflect the seasonal variances and associated potential for airborne asbestos that could have adverse effects on human health. The results of these air tests were used to quantify potential asbestos-related cancer risk for this health consultation. However, the obtained samples were just a snapshot of certain conditions not entirely representative of the range of conditions over recent years or likely in the future. Since the initial public release of the test results, the sampling conditions have come under scrutiny by the CAG as expressed in our response document to the EPA dated December 2007 in which we stated the following:

*“ while the risk calculations, from a toxicology standpoint, from the latest sample data do seem to have followed the “worst-case scenario” approach; the sampling itself may have underestimated major factors known to community members ( e.g. particular locations where soil asbestos content is believed to be high, weather variables such as dry windy conditions, and children and animals physically active in contaminated areas.)” (CAG response to EPA, 12/2007)*

The cancer risk prediction based upon these samples cannot be definitively accepted by our working group because the sample collection occasions and locations are a source of ongoing, high-level concern among our participants. The air test data may not have captured a true worst-case scenario due to wet conditions experienced within that year, as substantiated by the soil moisture percentage table presented on page 42 of the Health Consultation document. We notice that the ATSDR shares our concern about the potential range of weather conditions and states in the executive summary that drier conditions could yield a higher level of airborne asbestos:

*“ Across the 2006-2007 sampling events, seasonality appeared to have limited effect on the airborne asbestos levels. However, under dryer conditions (e.g. September 2007), increases in airborne asbestos were seen relative to wetter conditions in the rest of the sampling events. Therefore, drought or severely dry conditions could exacerbate the problem of re-entrainment of airborne asbestos and migration from the site.” (page iii, health consultation)*

If more sampling had occurred during drier conditions, we presume that higher test results would have been reported, along with a higher cancer risk projection. Within the 80+ years that these BoRit Asbestos piles have existed, inadequately covered and improperly contained, such dry and windy weather conditions have occurred many times. In fact, our participants recall various community drought warnings during extended time periods in the past decade.

## **2. Relationship between the BoRit Asbestos site, the Ambler Asbestos NPL site, and the impacted community**

The Ambler Asbestos site is within 100 yards of the BoRit Asbestos site, and the waste contamination at both sites is from the same manufacturer. The historical air sampling results are briefly discussed in the Health Consultation document to summarize certain highlights from the data on record for both sites. However, it seems implied in the first paragraph of this section (*page 7*) that there are two separate communities: 1) the “neighborhood surrounding the Ambler asbestos site”, and 2) the “community near the BoRit asbestos site”. We observe that the distinction between these two sites is to some extent arbitrary, and we prefer to characterize the impacted community as essentially a single community with salient public health implications arising from both sites over the historical timeline. Our participants are concerned that the focus of this Health Consultation on a narrow window of air sampling results at only one of the sites does not constitute an in-depth approach to study the potential for asbestos-related disease due to combined asbestos contamination from the presence of these two sites within the same community. The prior health assessment work completed for the Ambler Asbestos NPL site would seem to apply to this entire community. Why doesn't the ATSDR consider this relevant and provide a combined assessment?

### 3. Implications of activity-based sample results

The health consultation provides important information about disturbances related to activity conducted at the asbestos waste site:

*“Table 3 indicates that substantial increases in exposure can occur on-site when activities are disturbing the soil. ‘At the pile’ (ATP) raking results in a 116 fold increase in average asbestos exposure levels for AHERA type fibers and a 34 fold increase for PCMe fibers, when compared to comparable onsite results with no activities occurring. Both fiber counting methods show a statistically significant increase in asbestos air levels with raking when compared to levels seen on-site when no activity is taking place....” (page 13, health consultation)*

This causes some of us to have great unease while the EPA removal action preparation activities are currently underway. During the month of July 2008, many members of our community witnessed significant disturbances of the waste site as the EPA began removal actions. A high level of concern from many of the residents surrounding the site has ensued. We understand that the EPA reports that on-site air testing performed during the removal activities demonstrates that on-site exposures are well within the range protective for worker and resident safety. However, the risk for elevated air levels by virtue of asbestos fiber content at these locations, documented to contain up to 35% chrysotile asbestos fiber with 5% amosite asbestos fiber in the soil, demands that we expect proactive vigilance in project plans and a high level of engagement with the community for all phases of removal work.

### 4. Translating the air sampling results into an “inhaled asbestos fibers per day” calculation

The test results were communicated to the public with a unit of measurement in “fibers per cc” of air sample. We are concerned that a balanced overview of the results should include translating the test results into a measurement that provides information about the total number of asbestos fibers that would be inhaled in a one day period. The calculation involves considering the air volume in one breath multiplied by the respiratory rate in breaths per day.

The following calculation assumes:

Asbestos air concentration = 0.00098 fibers per cc (highest result for the non-activity based samples)

Tidal Volume = 500 cc (volume of air inhaled during quiet breathing at sleep)

Respiratory Rate = 12 breaths/minute (respiratory rate during quiet breathing at sleep)

Estimated Inhaled Asbestos Fibers per Day in an Adult =

$0.00098 \text{ fibers/cc} \times 500 \text{ cc/breath} \times 12 \text{ breaths/minute} \times 60 \text{ mins/hr} \times 24 \text{ hrs/day} = 8467 \text{ fibers per day}$

We provide this conservative calculation as an example that expresses potential exposure level in an entirely different numerical magnitude than the air sample test reports. The fiber concentration used in this calculation includes only the 5 micron and greater asbestos fibers. The total asbestos fiber exposure is many times greater in value. Furthermore, at increasing activity levels, the inhaled volume per minute increases markedly, as shown in the provided reference table.

### Metabolic level for adult males versus minute volumes in liters:

Metabolic Level	Breathing Minute volume (Liters)
Sleep	6.0
Rest	9.3
Light Work	19.7
Medium Work	29.2
Med. Heavy Work	40.0
Heavy Work	59.5
Maximum Work	132.0

(Source: NASA's Bioastronautics Data Book)

### 5. Potential cancer risk of short fibers

Our working group remains unconvinced about the soundness of excluding short asbestos fibers in assessing risk to human health.

The following passage represents a fundamental disagreement from one of our participants in response to perceived over-simplification, and resultant risk minimization, in the disregard of the short fibers for the final risk calculations in the health consultation.

*"According to the parametric data of F. Pott, 2.5 micron fibers are approximately 1/4 as carcinogenic as 5 micron fibers, but because of the fiber distribution, there are hundreds of times more fibers at 2.5 micron fibers as 5.9 micron fibers. And as the fibers get smaller toward the mean, around 1 micron, there are thousands times more fibers. The 1 micron fibers are about 1/16 as carcinogenic as 5 micron fibers. Incidentally, fibers above 10 microns are so heavy, they seldom become airborne. The most carcinogenic fibers (about 5 times the risk of 5 micron fibers) are 25 microns, but pose little potential airborne risk, because unless there are very high winds, they would not become airborne. It is the product of the number of fibers at a fiber micron length times the carcinogenicity at that length summed (integrated) over the whole spectrum of fiber lengths and their distributions that determines the total carcinogenic risk." (HERS working group dialogue)*

The executive summary of the health consultation begins to address the topic with emphasis:

*"There is not scientific consensus on the interpretation of the literature regarding the potential for lung cancer, mesothelioma and asbestos from exposure to short fibers." (in bold font, page iii, health consultation)*

We are at a loss to understand why the document subsequently, in seeming contradiction with itself, states:

*"Fibers shorter than 5  $\mu$ m in length do not add significantly to the risk of developing lung cancer or mesothelioma." (page 11, health consultation)*

As a frame of reference, it is important to iterate that there is no demonstrated safe level of asbestos exposure. There are at least some asbestos experts who question the notion of a “regulatory” fiber that must meet a certain minimum length as an over-simplification of methodology design for risk assessments. Furthermore, the working group is aware that the 2002 expert panel’s report after the World Trade Center disaster, cited in the health consultation document, has come under serious scrutiny by individuals at the EPA and within the broader scientific community. With this in mind, we appreciate when test results are conveyed with total counts for all TEM-detected asbestos fibers. Does the ATSDR share our uncertainty about whether the concentration of 5 micron and greater fibers is a good surrogate marker for total asbestos fiber concentration? Does the ATSDR consider it important for the concentration of all asbestos fibers to be included in air sample test reports?

## **6. Uncertainty about the predictive value of a risk model based upon historical epidemiology research in occupationally exposed populations**

Our working group has made a concerted effort to understand the Unit Risk multiplier (from EPA IRIS) that is used in the health consultation ( $0.23 (f/cc)^{-1}$ ). We have been informed that the value of this multiplier is based upon numerous historical epidemiology studies of workers with varying levels of asbestos exposure. Since these studies were performed prior to the advent of TEM technology, the correlation between asbestos fiber exposure and development of asbestos-induced cancer is assessed in terms of exposure to concentrations of 5 micron and greater length fibers. For this reason, according to our knowledge base, the EPA reports concentrations of PCMe fibers to provide a historically relevant measurement for risk analysis. We are uncertain about whether this risk analysis model is indeed appropriate for decision-making with regard to environmental and public health interventions in our community. Has this risk model ever been validated prospectively by successfully predicting excess cancer incidence within any population? We encourage governmental agencies to continue to refine this risk model in response to recent and future research wherever opportunities exist.

### **Additional Comments:**

The HERS working group will continue to gather information about the asbestos-related health issues that affect our community. The area of asbestos toxicology is complex and controversial within the scientific community. With this in mind, it seems appropriate that the ATSDR health consultation document is written with a precautionary tone in several important areas. Our community has been impacted by asbestos hazard for a long period of time, and we are thankful that the EPA and ATSDR are involved with the CAG as we pursue safer conditions for the BoRit Asbestos site. We support all efforts to improve environmental justice and minimize future asbestos exposure within our community.

**Directory of HERS Working Group Participants who are Contributors to this Response:**

**Michelle S. Naps, MD**

Physician  
Chair, Health, Environment, Risk & Safety (HERS) Working Group  
BoRit Asbestos Area Community Advisory Group

**Susan Curry**

Ambler Environmental Advisory Committee  
CAG Member Participant, Health, Environment, Risk & Safety (HERS) Working Group  
BoRit Asbestos Area Community Advisory Group

**Edward A. Emmett, MD, MS**

Center of Excellence in Environmental Toxicology  
CAG Member Participant, Health, Environment, Risk & Safety (HERS) Working Group  
BoRit Asbestos Area Community Advisory Group

**Philip Heimlich**

Retired Mechanical Engineer and Space Life Support Systems Engineer  
Community Participant, Health, Environment, Risk & Safety (HERS) Working Group  
BoRit Asbestos Area Community Advisory Group

**Sharon McCormick**

Citizens for a Better Ambler  
CAG Member Participant, Health, Environment, Risk & Safety (HERS) Working Group  
BoRit Asbestos Area Community Advisory Group

**Ann Misak**

Clean Water Action  
CAG Member Participant, Health, Environment, Risk & Safety (HERS) Working Group  
BoRit Asbestos Area Community Advisory Group