STATEMENT OF

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Before the

House Subcommittee on Environment and Hazardous Materials
House Committee on Energy and Commerce

Legislative Hearing on S.742 and Draft Legislation to Ban Asbestos in Products

February 28, 2008

Summary of Major Points of Testimony of Roger O. McClellan

- I support the central theme of the proposed legislation which is to ban asbestos except for those unique applications for which there are no suitable replacements.
- I support the need for a clear and accurate definition of asbestos and asbestiform, for example, as defined by EPA in 1993 in its document "Test Method for the Determination of Asbestos in Bulk Building Materials."[1]
- I support the development and use of validated test methods for identifying and quantifying asbestos and asbestiform mineral fibers while clearly distinguishing these minerals from non-asbestiform minerals, particularly in a mixed dust environment.
- I support maintaining the existing Toxic Substance Control Act threshold limit for asbestos with provision for changes in the threshold limit only when justified by new scientific findings that indicate a need to refine the level as a risk management tool to protect public health.
- Any new legislation that is enacted should clearly recognize the unique differences between asbestiform minerals and non-asbestiform minerals. There is a need to regulate asbestos and asbestiform minerals to control human health hazards due to fiber characteristics while avoiding unnecessary regulation of non-asbestiform minerals that do not cause the diseases associated with asbestos exposure.

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[1]USEPA (1993) Test Method for the Determination of Asbestos in Bulk Building Materials

Good Morning, Mr. Chairman, Ranking Minority Member and Members of the Subcommittee. Thank you for the invitation to present my views on S.742 and Draft Legislation to Ban Asbestos in Products. It is an honor and privilege to again have the opportunity to testify to this Committee on the scientific basis of important proposed legislation.

My biography is attached to this statement (Attachment 1). Since 1999, I have served as an Advisor to public and private organizations on issues related to air quality in the ambient environment and workplace drawing on more than 45 years of experience in comparative medicine, toxicology, aerosol science, and risk analysis. Prior to 1999, I provided scientific leadership for two organizations, the Chemical Industry Institute of Toxicology (now the Hamner Institute) in Research Triangle Park, NC and the Lovelace Inhalation Toxicology Research Institute (now the Lovelace Respiratory Research Institute) in Albuquerque, NM, that earned an international reputation for developing scientific information under-girding occupational and environmental health standards.

The testimony I offer today also draws on my experience serving on numerous scientific advisory committees. This has included service on many EPA Scientific Advisory Committees from the origin of the Agency to the present time, including the Clean Air Scientific Advisory Committee (CASAC), which I chaired from 1988 to 1992, and on CASAC Panels that have considered all the criteria pollutants at various times. I have also served on numerous other scientific advisory committees, typically concerned with air quality issues, for other government agencies, the National Research Council/National Academy of Sciences, the Institute of Medicine, and international organizations such as the International Agency for Research on Cancer and the World Health Organization.

I am a strong proponent of using scientific information to inform legislative and agency policy judgments that are required to protect public health. I am testifying today at the request of an ad-hoc group of associations, including the National Stone, Sand and Gravel Association, Associated Builders and Contractors, National Mining Association, Associated General Contractors, Association of Equipment Dealers, and the Industrial Minerals Association of North America, whose shared concern is the clarity of distinction between asbestiform fibers and nonasbestiform fibers. The opinions I relate today are my own personal scientific views. I wish to make the following points:

(1) I support the central theme of the proposed legislation which is to ban asbestos except for those unique applications for which there are not suitable replacements.

(2) Any legislation purporting to "ban" asbestos should contain the following key elements of the Senate-passed Bill:

(a) A clear and accurate definition of asbestos, and asbestiform minerals, for example, as EPA defined them in 1993. The EPA (1993) definition of asbestiform minerals is shown in its entirety in Attachment 2.

(b) The use of validated test methods for collection of samples and sample preparation, processing and analysis that specifically identifies asbestos and asbestiform minerals while also distinguishing them from non-asbestiform materials in a mixed-dust environment, as they are generally found in mines and quarries. As an example, the study language provided in S.742 seeks to better define such test methods. Further, any threshold limits related to asbestos must factor into account that asbestiform minerals are a natural part of the human environment..

(c) Maintains the existing Toxic Substance Control Act threshold limit related to asbestos with provision for change in the threshold limit only when justified by new scientific findings indicative of both a need to refine the threshold level as a risk management tool to protect public health as well as an ability for lower limits to be reliably put into practice.

(3) It is critical that any legislation that is enacted recognize the unique physical characteristics of asbestiform materials that cause them to pose a health hazard as contrasted with the physical characteristics of non-asbestiform materials, that may have a similar chemical composition, but in a non-fiber form do not pose a health hazard. This difference between asbestiform materials, that are hazardous, and rocks, that are not hazardous, is apparent from consideration of Figure 1. The photographs in the first and third column are of six minerals known commercially as asbestos. The unique physical structure with bundles of long, thin flexible fibers is readily apparent. These fibers, when inhaled, cause respiratory disease and are universally viewed as being hazardous. The ordinary rocks of the same chemical composition are shown in the second and fourth columns. These rocks do not break up into fibers, rather they break up into fragments of varied size. Some of the rock fragments are elongated and are called cleavage fragments. Inhalation of the non-asbestiform material, including cleavage fragments, is not associated with development of diseases as seen with the fibers. In Figure 2, the difference between the asbestiform materials that cause disease and the rock fragments that do not cause disease is illustrated. The key distinction is the presence of long, thin

fibers for asbestiform minerals. This contrasts with the irregular shape of the fragments of rocks, with even the elongated fragments being quite short and stubby.

(4) The potential impact of misclassifying ordinary rocks as being asbestos-like is apparent from considering Figure 3. The map shows "green areas" where both rare asbestiform minerals and also their more common non-asbestiform counterparts, might be found. As may be noted, these areas are in the mountainous areas of the United States where igneous and metamorphic rock formations are found. The green areas of the map more commonly contain non-asbestiform minerals and, more uncommonly, asbestos. As even a cursory review of this map would indicate, much of the country is covered by these minerals.

Conclusion:

It is clearly important to have appropriate risk management procedures that provide for risk management for control of exposure to hazardous asbestiform minerals and avoidance of their human health risks. It is also important that these risk management procedures not inappropriately impact on the use of non-asbestiform minerals that do not pose a health hazard.

Figure 1

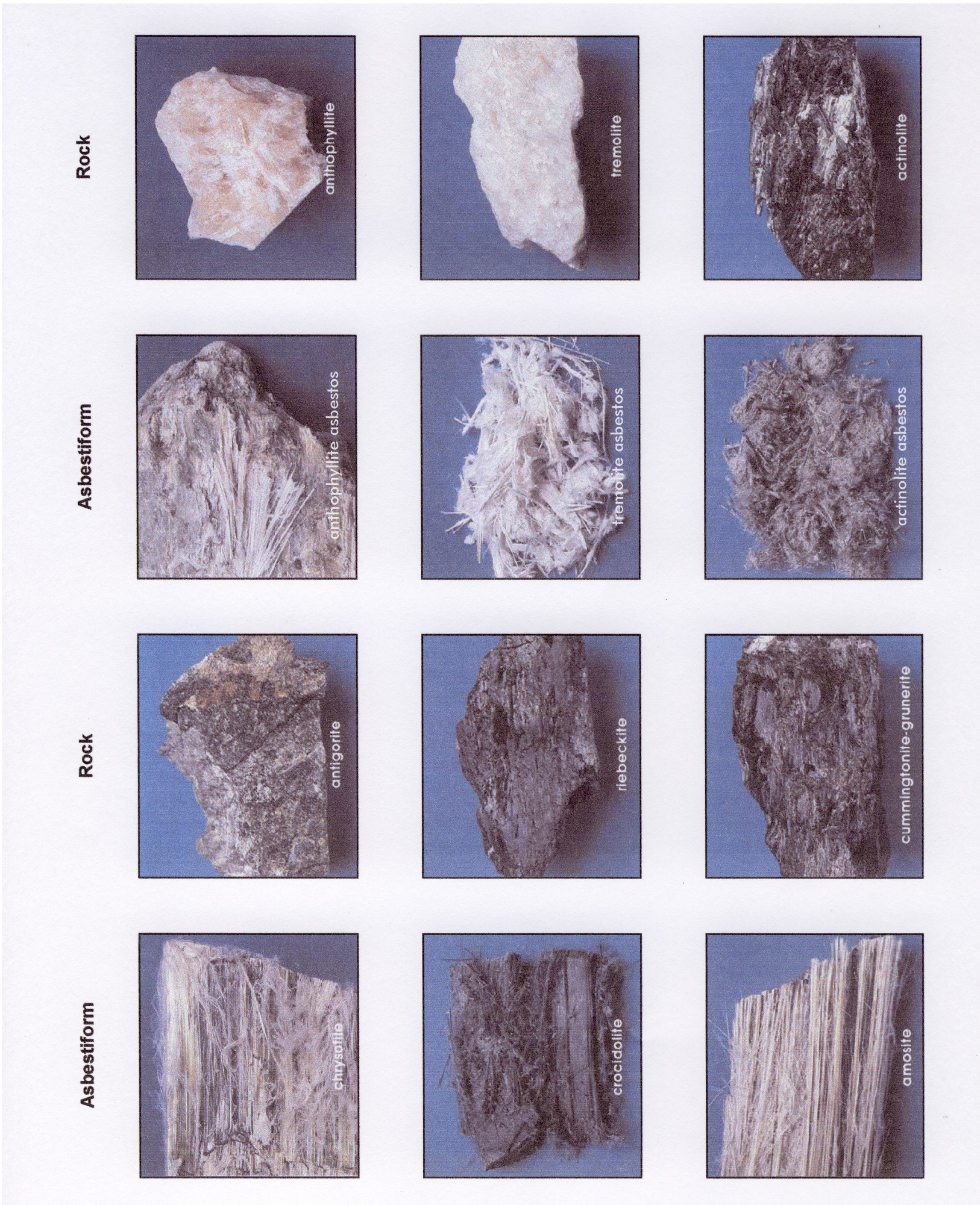
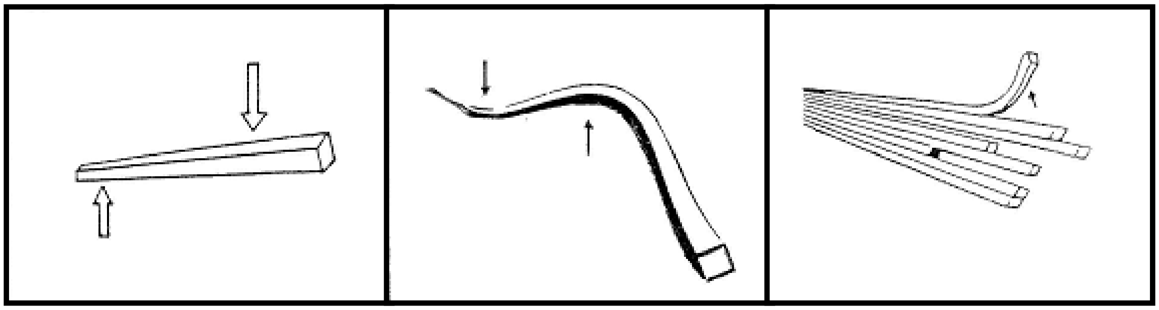

Rock
anthophyllite
tremolite
actinolite
Asbestiform
anthophyllite asbestos
tremolite asbestos
actinolite asbestos
Rock
antigorite
riebeckite
cummingtonite-grunerite
Asbestiform
chrysotile
crocidolite
amosite

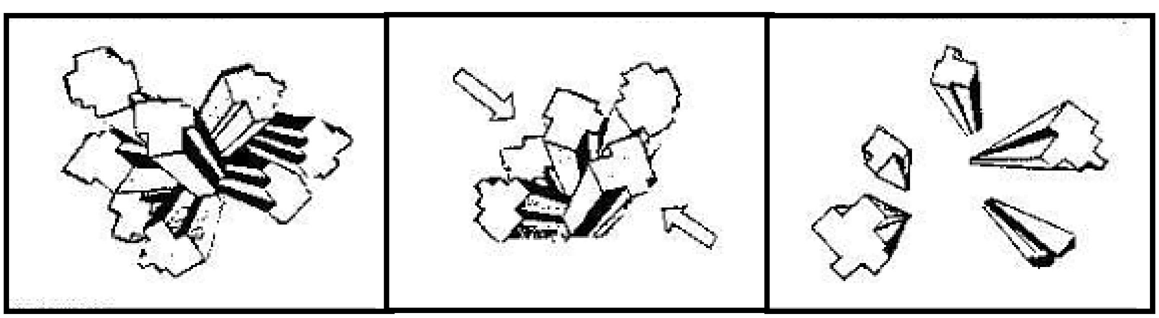
Figure 2

ASBESTIFORM



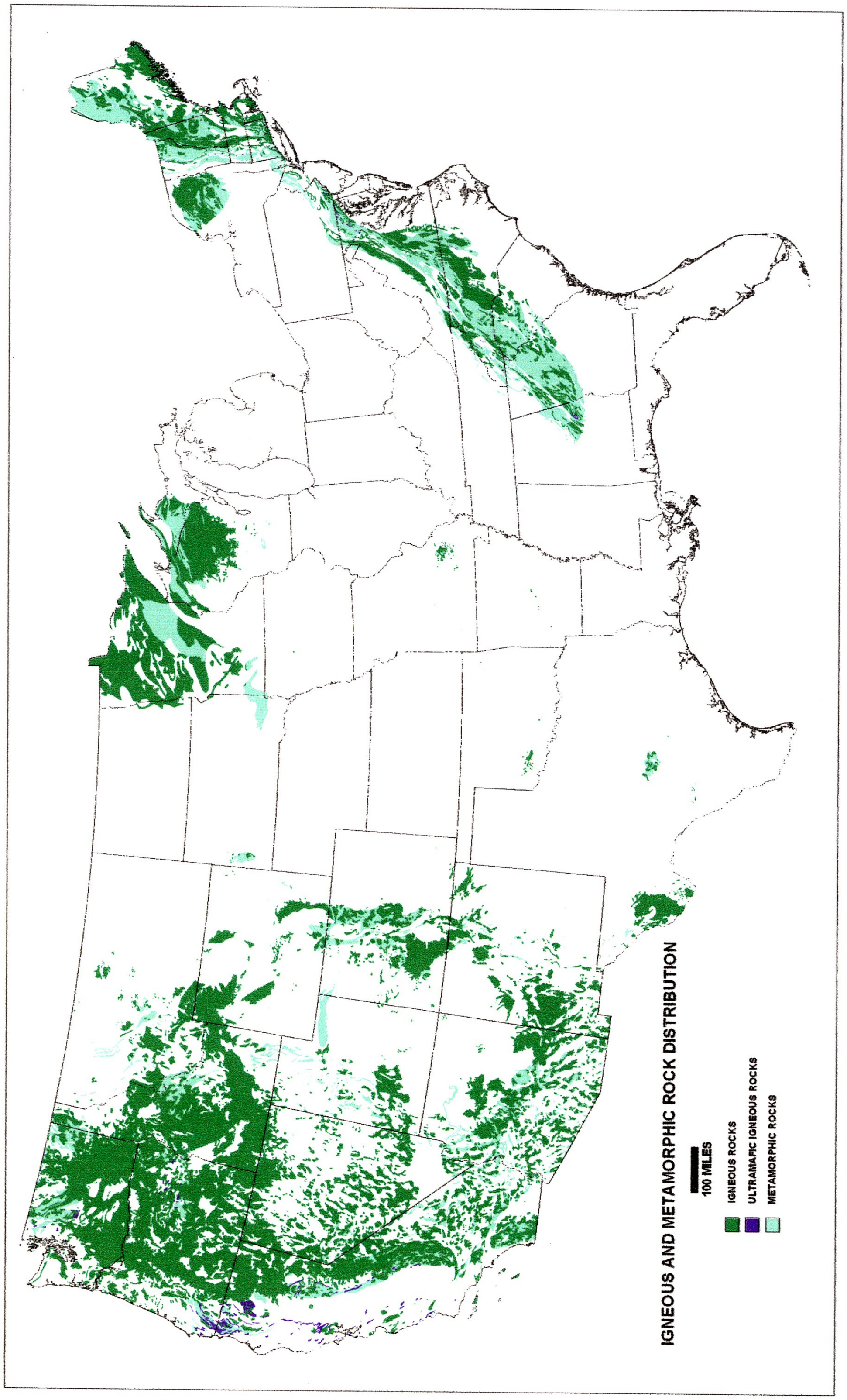
As the drawings above illustrate, asbestiform (asbestos-like) minerals consist of fibers that grow almost exclusively in one dimension, are easily bent and occur as bundles of smaller fibers, which are called fibrils. In fact, the bundling effect of asbestiform minerals is a unique distinguishing feature. Some asbestiform minerals display splayed ends. Asbestiform minerals also are long and thin, with aspect (length-to-width) ratios of typically 20:1 to 100:1 or greater. Most asbestiform fibers are less than 0.1 microns in width, and nearly all are less than 0.5 micron. Individual fibers are only visible with the aid of a microscope.

ROCKS



Unlike asbestiform minerals, ordinary rock-forming minerals grow in several directions at once. Under pressure, unlike asbestiform minerals which bend, ordinary rock-forming minerals fracture easily into particles called cleavage fragments. Of those, some are needle-shaped (acicular), and some show stair-step cleavage patterns. Cleavage fragments tend to be shorter and thicker than their asbestiform counterparts; nearly all have widths that exceed 0.5 microns and lengths below about 10 microns.

Figure 3


IGNEOUS AND METAMORPHIC ROCK DISTRIBUTION
100 MILES
IGNEOUS ROCKS
ULTRAMAFIC IGNEOUS ROCKS
METAMORPHIC ROCKS

<u>**ATTACHMENT 1**</u>

BIOGRAPHY

ROGER O. McCLELLAN, DVM, MMS, DSc (Honorary), Dipl-ABT, Dipl-ABVT, Fellow-ATS

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ROGER O. McCLELLAN is currently an advisor to public and private organizations on issues concerned with inhalation toxicology and human health risk analysis. He received his Doctor of Veterinary Medicine degree with Highest Honors from Washington State University in 1960 and a Master of Management Science degree from the University of New Mexico in 1980. He is a Diplomate of the American Board of Toxicology, a Diplomate of the American Board of Veterinary Toxicology and a Fellow of the Academy of Toxicological Sciences.

He served as Chief Executive Officer and President of the Chemical Industry Institute of Toxicology (CIIT) in Research Triangle Park, NC from September 1988 through July 1999. The CIIT continues today as The Hamner Institute. During his tenure, the organization achieved international recognition for the development of science under-girding important environmental and occupational health regulations. Prior to his appointment as President of CIIT, Dr. McClellan was Director of the Inhalation Toxicology Research Institute, and President and Chief Executive Officer of the Lovelace Biomedical and Environmental Research Institute, Albuquerque, New Mexico. The Institute continues operation today as a core element of the Lovelace Respiratory Research Institute. During his 22 years with the Lovelace organization, he provided leadership for development of one of the world's leading research programs concerned with the toxic effects of airborne radioactive and chemical materials. Prior to joining the Lovelace organization, he was a scientist with the Division of Biology and Medicine, U.S. Atomic Energy Commission, Washington, DC (1965-1966), and Hanford Laboratories, General Electric Company, Richland, WA (1959-1964). In these assignments, he was involved in conducting and managing research directed toward understanding the human health risks of internally deposited radionuclides.

Dr. McClellan is an internationally recognized authority in the fields of inhalation toxicology, aerosol science and human health risk analysis. He has authored or co-authored over 300 scientific papers and reports and edited 10 books. In addition, he frequently speaks on risk assessment and air pollution issues in the United States and abroad. He is active in the affairs of a number of professional organizations, including past service as President of the Society of Toxicology and the American Association for Aerosol Research. He serves in an editorial role for a number of journals, including continuing service as Editor of Critical Reviews in Toxicology. He serves or has served on the Adjunct Faculty of 8 universities.

Dr. McClellan has served in an advisory role to numerous public and private organizations. He has served on senior advisory committees for 8 federal agencies. He is past Chairman of the Clean Air Scientific Advisory Committee, Environmental Health Committee, Research Strategies Advisory Committee, and Member of the Executive Committee, Science Advisory Board, U. S. Environmental Protection Agency; Member, National Council on Radiation Protection and Measurements; Member, Advisory Council for Center for Risk Management, Resources for the Future; a former Member, Health Research Committee, Health Effects Institute; and service on National Academy of Sciences/National Research Council Committees on Toxicology (served as Chairman for 7 years), Risk Assessment for Hazardous Air Pollutants, Health Risks of Exposure to Radon, Research Priorities for Airborne Particulate Matter, as well as the Committee on Environmental Justice of the Institute of Medicine. He has recently completed a term on the Board of Scientific Councilors for the Centers for Disease Control and Prevention for Environmental Health Research and the Agency for Toxic Substances and Disease Registry. He is currently serving on the National Institutes of Health Scientific Advisory Committee on Alternative Toxicological Methods and the National Aeronautics and Space Administration Lunar Airborne Dust Toxicity Advisory Group.

Dr. McClellan's contributions have been recognized by receipt of a number of honors, including election in 1990 to membership in the Institute of Medicine of the National Academy of Sciences. He is a Fellow of the Society for Risk Analysis, the Health Physics Society, and the American Association for the Advancement of Science. In 1998, he received the International Achievement Award of the International Society of Regulatory Toxicology and Pharmacology of standing contributions to improving the science used for decision making and the International Aerosol Fellow Award of the International Aerosol Research Assembly for outstanding contributions to aerosol science and technology. He received the Society of Toxicology 2005 Merit Award for a distinguished career in toxicology. In 2005, The Ohio State University awarded him an Honorary Doctor of Science degree for his contributions to the science under-girding improved air quality. In 2006 he received the New Mexico Distinguished Public Service Award. He has a long-standing interest in environmental and occupational health issues, especially those involving risk assessment and air pollution, and in the management of multidisciplinary research organizations. He is a strong advocate of risk-based decision-making and the need to integrate data from epidemiological, controlled clinical, laboratory animal and cell studies to assess human health risks of exposure to toxic materials.

ATTACHMENT 2

EPA Definition of Asbestiform

The following definition is taken from the EPA document "Test Method: Method for Determination of Asbestos in Bulk Building Materials"

Accuracy – The degree of agreement of a measured value with the true or expected value.

Anisotropic – Refers to substances that have more than one refractive index (e.g. are birefringent), such as nonisometric crystals, oriented polymers, or strained isotropic substances.

Asbestiform (morphology) – Said of a mineral that is like asbestos, i.e., crystallized with the habit of asbestos. Some asbestiform minerals may lack the properties which make asbestos commercially valuable, such as long fiber length and high tensile strength. With the light microscope, the asbestiform habit is generally recognized by the following characteristics:

- Mean aspect ratios ranging from 20:1 to 100:1 or higher for fibers longer than 5 µm. Aspect ratios should be determined for <u>fibers, not bundles</u>.
- Very thin fibrils, usually less than 0.5 micrometers in width, and
- Two or more of the following:
    - Parallel fibers occurring in bundles,
    - Fiber bundles displaying splayed ends,
    - Matted masses of individual fibers, and/or
    - Fibers showing curvature

These characteristics refer to the <u>population of fibers</u> as observed in a bulk sample. It is not unusual to observe occasional particles having aspect ratios of 10:1 or less, but it is unlikely that the asbestos component(s) would be dominated by particles (individual fibers) having aspect ratios of <20:1 for fibers longer than 5 µm. If a sample contains a fibrous component of which most of the fibers have aspect ratios of <20:1 and that do not display the additional asbestiform characteristics, by definition the component should not be considered asbestos.

Asbestos – A commercial term applied to the asbestiform varieties of six different minerals. The asbestos types are chrysotile (asbestiform serpentine), amosite (asbestiform grunerite), crocidolite (asbestiform riebeckite), and asbestiform anthophyllite, asbestiform tremolite, and asbestiform actinolite. The properties of asbestos that caused it to be widely used commercially are: 1) its ability to be separated into long, thin, flexible fibers; 2) high tensile strength; 3) low thermal and electrical conductivity; 4) high mechanical and chemical durability, and 5) high heat resistance.