

Asbestos Exposures to Truck Drivers During World Trade Center Cleanup Operations

Patrick N. Breyse,¹ D'Ann L. Williams,¹ Julie B. Herbstman,²
J. Morel Symons,² Steve N. Chillrud,³ James Ross,³ Shannon Henshaw,¹
Katherine Rees,¹ Mike Watson,⁴ and Alison S. Geyh¹

¹Johns Hopkins Bloomberg School of Public Health, Department of Environmental Health Sciences, Baltimore, Maryland

²Johns Hopkins Bloomberg School of Public Health, Department of Epidemiology Health Sciences, Baltimore, Maryland

³Columbia University Lamont-Doherty Earth Observatory, Palisades, New York

⁴International Brotherhood of Teamsters, Washington, D.C.

This article presents results of asbestos air sampling conducted to assess the exposure to truck drivers working at the World Trade Center site. Sampling consisted of a combination of area and personal monitoring of 49 truck drivers and included optical and electron microscopic analyses. Three sampling periods were conducted: October 1–7, 2001, October 17–26, 2001, and April 13–23, 2002. Area sample locations were selected to estimate airborne concentrations around the perimeter of the site, on top of the pile, and in the pit. Air samples were collected using a 50-mm conductive cowl and a 25-mm mixed cellulose ester filter at flow rates ranging from 0.5–2 L/min. Samples were analyzed using a combination of phase contrast microscopy (PCM) NIOSH method 7400, transmission electron microscopy (TEM) NIOSH method 7402, and the direct method specified under the Asbestos Hazardous Emergency Response Act. Sample times and flow rates were adjusted to prevent overloading while maximizing sample volume. Personal sampling results suggest that asbestos fiber exposures to truck drivers at the site were low. Exposures based on TEM results generally ranged from less than detectable to 0.1 structures per cubic centimeter (s/cm³). TEM-based results further indicate that the majority of asbestos fibers were chrysotile and less than 5 μm in length. PCM-based estimates were generally higher than the TEM results. This is likely due to the counting of nonasbestos fibers. This conclusion is supported by the NIOSH 7402 TEM results, which did not detect asbestos fibers longer than 5 μm. Area sample results were generally less than the personal results (except for the sample collected on top of the rubble pile) and decreased over the course of the cleanup. Our results show low airborne asbestos concentrations and a predominance of short fibers. Given these low concentrations, evidence of short fibers, and the short duration of the exposure (less than 10 months to complete the cleanup), it is likely that truck drivers working at the site are not at an increased risk for asbestos-related disease.

Keywords World Trade Center, asbestos, truck drivers, exposure assessment
