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May 4, 2016

Kathleen Schuler, MPH
Healthy Kids and Families Program Director
Healthy Legacy Co-Director
Conservation Minnesota
1101 West River Parkway, Suite 250
Minneapolis, MN 55415

**Re: The hazards to children's health of using recycled tires in athletic fields**

Dear Ms. Schuler,

Thank you for having asked to provide a statement on the risks to children's health of using recycled tires in the construction of athletic fields.

I am a pediatrician and epidemiologist and Dean for Global Health in the Icahn School of Medicine at Mount Sinai in New York City. I have been a member of the faculty at Mount Sinai since 1985, and I served as Chair of the Department of Preventive Medicine from 1990 to 2015. I am also a Professor of Pediatrics. Prior to joining Mount Sinai, I served in the US Public Health Service at the Centers for Disease Control and Prevention (the CDC) in Atlanta. I have been involved for many decades in research and practice to protect children against environmental threats to health. I have chaired committees at the National Academy of Sciences, and I am co-editor of the *Textbook of Children's Environmental Health* published in 2013 by Oxford University Press. I am a graduate of Harvard Medical School and the University of London.

The use of recycled waste tires for playground mulch and crumb rubber athletic field infill potentially puts the health of children and athletes at risk. My first concern is health risks from heat effects of vigorously exercising on crumb rubber fields. Because the crumb rubber material absorbs solar radiation on hot sunny days, temperatures can reach 130 and as high as 173 degrees. This environment puts children at risk for heat-induced illness such as dehydration, heat stress, heat stroke and heat burns.

My second serious concern with the use of crumb rubber on playgrounds and fields is exposure toxic chemicals, including 1,3-butadiene a known human carcinogen and an integral component of the synthetic rubber used in manufacture of most tires; polycyclic aromatic hydrocarbons (PAHs), also known carcinogens; volatile organic compounds (VOCs), many of which are neurotoxic; and heavy metals such as lead. Many of the chemicals in crumb rubber volatilize, especially in hot weather, and can be inhaled. The crumb rubber pellets stick to children's hands and bodies and can be ingested when children put their hands in their mouths.

Children spend many hours on playgrounds and athletes practice and play on synthetic turf fields almost every day. They can have substantial cumulative exposure to the chemicals in crumb rubber. Children's exposure to these chemicals is further magnified by their high rate of breathing during vigorous exercise and the frequent contact of their bodies with the surface of the playing field during hard play. Any level of exposure to known carcinogens or neurotoxic chemicals is too much. There are no safe levels of exposure to these chemicals, especially for children.

The most effective strategy for protecting children against exposures to chemicals in crumb rubber is to prevent the installation of playgrounds and athletic fields that use this material.

Sincerely,

Philip J. Landrigan, MD, MSc, FAAP