

**Rubber Mulch in Playgrounds:
Exposure and Potential Health Impacts
Summary Report**
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The use of crumb and shredded rubber materials in playgrounds and athletic fields has increased in popularity in public recreational facilities across Dane County in recent years. These materials, produced from recycled scrap tires, are often employed as mulch and/or padding to reduce injury from falls and improve the lifespan and quality of the recreational site. However, due to the nature of the material used in these products, concerns have been raised by local residents about the possible exposure of children and adolescents to harmful chemicals and heavy metals when using these facilities. In response to this public concern, Public Health Madison and Dane County (PHMDC) conducted a review of the available literature to evaluate the potential threat to human health and environmental quality from the application of crumb and/or shredded rubber materials to local playgrounds and athletic fields.

Based on this review, the available literature suggests that adverse impacts to human health and/or environmental quality from the use of this material in playgrounds and athletic fields are unlikely and should be considered a viable option to improve recreational resources. This conclusion was based upon the following:

- Release of chemical constituents from the rubber tires used in the material into the soil and air is limited; this includes volatile organic compounds (VOCs), benzene, heavy metals, polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs). Therefore, exposure to concentrations of chemicals and metals from the scrap tire material sufficient to influence the health of users of the recreational site is unlikely among the general population.
 - ❖ However, an estimated 6 to 12% of the United States population is allergic to rubber materials resulting in the possibility of an allergic response among individuals in this sensitive population.
- Research has repeatedly demonstrated that surfaces composed of scrap tire materials can have considerably higher surface temperature compared to grass or sand surfaces. Prolonged contact with scrap rubber surfaces may lead to discomfort, thermal injury, and/or heat related illness; therefore, use of recreational resources should be appropriate and parents/ guardians should monitor young children. Lighter colored rubber materials reduce this potential hazard.

- Research has not detected levels of chemical constituents from the rubber material leaching into the environment at concentrations that would threaten water and air quality.
 - ❖ However, there is evidence of localized plant toxicity at the application site of the rubber material resulting in decreased plant growth but this is site specific and highly dependent upon temperature, rainfall, acidity, and product wear.
- Use of crumb and shredded rubber materials in playgrounds and recreational sites has increased the lifespan of these resources and improved user safety of these sites due to a reduction in fall- and muscle stress-related injuries.
- The use of scrap tires for crumb and shredded rubber materials account for an estimated 10% of all recycled tire material nationwide; thus reducing the amount of tires available for dumping and potential use for breeding grounds for mosquitoes and other vectors of disease.

In summary, a thorough review of the available literature suggests that adverse impacts to human health and/or environmental quality from the use of crumb and/or shredded scrap tire rubber materials in playgrounds and athletic fields is unlikely among the general population. In addition, the use of these products have allowed a significant number of scrap tires to be recycled, reduced fall and muscle stress-related injuries among users of playgrounds and athletic fields, and increased the lifespan of recreational resources. However, allergic and/or temperature-related responses following prolonged exposure cannot be ruled out among sensitive populations and/or inappropriate use, respectively. Despite these potential limited risks to sensitive populations, the overall use of crumb and/or shredded rubber materials is beneficial to the community and should be considered a viable option to improve recreational resources.

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