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July 30, 2010

Result of State Artificial Turf Fields Study: No Elevated Health Risk

But higher contaminant levels at an indoor field suggest ventilation needs

HARTFORD – A new study of artificial turf fields containing crumb rubber infill conducted by four state agencies shows that health risks are not elevated from playing on the fields. However, higher contaminant levels at one indoor field indicate that ventilation of indoor fields should be considered. Storm water run off findings indicate that proper management of this run off is prudent to address possible environmental effects.

The study findings were peer reviewed by the Connecticut Academy of Science and Engineering, whose comments were incorporated into the final report.

"This study presents good news regarding the safety of outdoor artificial turf fields," stated Department of Public Health Commissioner Dr. J. Robert Galvin. "While the findings indoors were below the health risk targets, the elevated contaminant levels suggest a need to ventilate these fields so they can be brought to the level of safety outdoors. What we've learned from this study in Connecticut will provide valuable guidance to municipalities, schools and others who operate or are considering installing artificial playing fields."

Study Background

The four state agencies, the University of Connecticut Health Center, the Connecticut Agricultural Experiment Station, the Department of Public Health and the Department of Environmental Protection evaluated the health and environmental impacts associated with artificial turf fields containing crumb rubber infill. A key aspect of the study was a field investigation conducted in July 2009, when the UCONN Health Center sent a team of researchers to four outdoor fields and one indoor field across Connecticut. Three soccer players at each field were equipped with personal monitoring devices and the recorded results, together with the stationary samplers, were used to characterize possible exposures. Overall, approximately 200 chemicals were tested at each field.

Health Risk Assessment

The Department of Public Health (DPH) used the data from the field investigation to evaluate health risks. Exposures and risks were not elevated relative to what is commonly found in outdoor air for both children and adults using the fields. Indoor fields showed higher levels of chemical emissions. While these levels do not suggest a health risk, DPH recommends ventilation of indoor fields. Developers of new indoor fields should consider alternatives to crumb rubber infill as a cushioning agent.

Environmental Evaluation

The Department of Environmental Protection (DEP) evaluated the environmental risk associated with storm water runoff from the artificial turf fields tested in the air study. Three of eight storm water samples showed elevated levels of zinc leaching from the fields that may present a risk to aquatic organisms. Other metals and rubber related compounds tested in run off were not elevated. Based on these results, DEP concludes that there is no risk to drinking water from this runoff, but a potential risk exists for surface waters and aquatic organisms.

The DEP suggests that use of storm water treatment measures may reduce the concentrations of zinc in the storm water runoff from artificial turf fields to levels below the acute aquatic toxicity criteria. Individual artificial turf field owners should evaluate the storm water drainage systems at the fields and the hydrologic and water quality characteristics of any receiving waters to determine the appropriateness of a storm water treatment measure.

CASE Review

The state agencies asked the Connecticut Academy of Science and Engineering (CASE) to review and comment on the study. CASE is a private, nonprofit, public service institution whose mission is to evaluate issues and technological advances that are of potential concern to the people of Connecticut. CASE assembled a nine member expert panel to review all aspects of the study. Comments included that cancer risks calculated by DPH may have been overestimates because of the inclusion of benzene detections that are likely not coming from the playing field but from the players themselves. To address CASE's comments, the risk assessment describes the issues and finds that they do not change the overall conclusions and unlikely present added risk.

Background on Artificial Playing Fields and Crumb Rubber

Installation of artificial turf fields has become a more common practice as cities, towns, and educational



institutions seek to reduce both maintenance needs created by the heavy use of grass fields and demands for water and pesticides needed for care of natural grass. One popular design for these fields involves the use of crumb rubber infill, which provides, drainage, a layer of padding and holds the blades of synthetic grass upright. The crumb rubber used in artificial turf fields is mainly composed of recycled tires, which contain man-made and natural rubber. Chemicals called polycyclic aromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs) can be found in the crumb rubber. Crumb rubber can also contain heavy metals such as zinc and copper.

The study was funded with \$245,000 available to DEP for special projects from the settlement of cases involving violations of environmental regulations.

For more information and to view the entire study, please visit www.ct.gov/deep/artificialturf

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