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Expert Analysis

**CRUMB RUBBER TURF WARS: THE ATTACK ON SYNTHETIC TURF
PLAYING FIELDS**By William L. Anderson, Esq., and Cheryl A. Falvey, Esq., Crowell & Moring^{aa1}

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William L. Anderson and Cheryl A. Falvey of Crowell & Moring analyze health studies on crumb rubber, a material used in artificial turf fields in many sports arenas and playgrounds. They say the studies do not support the claims that exposure to fields made with crumb rubber is causing cancer in people who use them.

All those beautiful artificial turf fields popping up everywhere these days have transformed the sports and playground surface industry. The artificial fields stay green all year round, work well in any kind of weather, never turn to mud or dust, and require no herbicides or fertilizers to maintain. No wonder these fields now cover the football stadium surfaces of many college and pro teams, as well as thousands of local community soccer fields and playgrounds.

But the promise and advantages these fields bring to sports is being threatened by currently unsupported allegations of a darker side of the turf field lurking beneath the surface -- or more accurately, in the surface of these fields.

The fields use a material called crumb rubber, made from tiny bits of ground up tires, to provide the "infill" necessary to support the grass blades and to cushion impacts. In part led by a monograph published in 2007 by Environment and Human Health Inc., or EHHI, a group of advocates has mounted an increasingly aggressive attack on crumb rubber. Those advocates claim that crumb rubber contains carcinogens and either could or actually is causing cancers and other health problems for people who use these fields. Many news stories cite to a group of over 150 soccer players identified with cancer -- including many goalies, who spend more time on the turf surface.

Because the crumb rubber material consists of chopped or ground-up tire bits, it is likely no more dangerous than a tire itself. But in the ground-up form, crumb rubber lays loose

on these fields, sprays up when balls strike it, and routinely clings to the shoes, clothing and skin of players. Many soccer moms and dads have no doubt cleaned it off their own children's clothing at home. Thus, crumb rubber presents an attractive target for adverse health claims -- a strange material (what are these small black pellets?), known to contain certain carcinogens and used on fields where children play. Moreover, the material can attach to skin and clothing, and presumably it can be ingested.

For years, the challenge to crumb rubber failed to gain traction. But NBC News picked the story up in October 2014 and again a year later in a series of specials. That and other media coverage helped generate congressional attention. After requests from certain members of Congress, three federal agencies -- the Consumer Product Safety Commission, the Environmental Protection Agency, and the Centers for Disease Control and Prevention -- recently announced a joint health investigation. California's Office of Environmental Health Hazard Assessment, or OEHHA, has also announced a three-year investigation, in which EPA will assist. The studies will examine the way in which the fields are used, likely sources of exposure and the contents of crumb rubber. They may also monitor actual releases.

***2** The CPSC has advised Congress that crumb rubber is one of its two top priorities for 2016-2017, so the agency investigation is not an inconsequential effort. No litigation has yet ensued over these health claims, other than a short burst of activity some years ago focused on lead in the grass itself. But some plaintiff firms are trolling, and the investigations could prompt medical monitoring or other litigation.

This analysis provides background on the health issues and studies to date, explains why the existing studies do not support the claims and predicts where the investigations are likely headed. In the world of emerging torts, crumb rubber has moved into the top echelon of potential new sources of claims.

Crumb rubber: What is it and where is it used?

Crumb rubber is made of the car and truck tires that formerly filled the nation's landfills -- or worse, piled up on roadsides and in empty lots. Today, used tires are ground up and recycled to create, among other things, the infill for synthetic turf. Tires are reduced to tiny, granular rubber pieces, with 99 percent or more of the steel and fabric removed from them.

In artificial turf, the recycled crumb rubber acts as a sort of synthetic dirt that fills the space between and supports plastic blades of grass. The use of crumb rubber is not limited to synthetic sports fields; in fact, it has covered playgrounds and running tracks for well over a decade.

Because of its advantages over natural or other synthetic turf, as well as its success as a means to recycle scrap tires (between 20,000 and 40,000 tires are ground up per football

field), the use of crumb rubber has become widespread.

Many local playing fields have it in place today, and a large number of universities and professional sports leagues have installed crumb rubber football, soccer, baseball, field hockey and other fields.

The industry group Synthetic Turf Council reports that there are over 12,000 synthetic fields installed in parks, schools and sports facilities across the United States, with many more being installed every year.

The spread of the attack on crumb rubber

The criticisms of crumb rubber have existed for a number of years, but they did not begin to coalesce until the EHHI's extensive review and critique in 2007.¹ The EHHI review identified substances in crumb rubber as known or potential carcinogens.

In 2015 the EHHI commissioned a laboratory study by the Yale School of Forestry and Environmental Studies that confirmed the presence of a group of known or suspected carcinogenic chemicals in several samples of crumb rubber. The Yale study did not, however, address the concentrations available or whether actual field conditions would produce hazardous levels of these materials.

The Mount Sinai Children's Environmental Health Center similarly published a report in 2009 stating that substances in crumb rubber "are known to cause birth defects ... and even cancer" at high levels. The publication recommended that alternatives be used and said crumb rubber fields should contain warnings not to use turf on hot days or for "passive recreation" (such as lying down). It also said that young children should be monitored for ingestion.

***3** Similar publications typically name some of the rubber constituents, couple that with the rubber pellet contact that occurs on playing fields, and argue for use of alternatives to "avoid the risk."

The product likely does contain a number of materials known or suspected to be carcinogens, but it seems unlikely that those carcinogens would pose a risk to field users. Tires contain a number of chemical ingredients at issue, including carbon black (30 percent), lead, zinc and other heavy metals, and oils with polycyclic aromatic hydrocarbons and volatile organic compounds, some of which are known or suspected carcinogens. Butadiene and styrene are apparently key components. These materials are bound up in the rubber matrix. The risk of release of these materials is either nonexistent or very low, and it is consistent with background exposures to similar substances.

That is the conclusion, at least, of many national and state health agency reviews to date. In contrast to the EHHI and Mount Sinai publications, these reviews have consistently concluded that there is no cause for concern. They include investigations by the California

OEHHA, New York State Department of Health, CPSC, New York State Department of Environmental Conservation, New York City Department of Health and Mental Hygiene, EPA, Connecticut Department of Public Health, Robert Wood Johnson Medical School, and Norwegian Institute of Public Health.

The Synthetic Turf Council has compiled more than 50 relevant studies on its website.² One typical conclusion is that of the city of Toronto:

Available evidence does not indicate that playing on third generation artificial turf will result in exposure to contaminants at levels that pose a significant risk to human health provided it is properly installed and maintained and users follow simple hygienic practices. ... While there are still some uncertainties regarding impacts from exposure to some substances found in artificial turf (carbon nanotubes, lead and other metals, latex, some metals, and polyaromatic hydrocarbons, for example), standard hygienic measures will minimize any of these risks. Under such conditions, and in the cases where use of natural turf is not possible or practical, the benefits from increased physical activity on fields are expected to outweigh the risks from exposure to toxic substances.³

The New York City Department of Health and Mental Hygiene concluded that even when crumb rubber releases chemicals, "ingestion, dermal or inhalation exposures to chemicals in or released from crumb rubber do not pose a significant public health concern."⁴

The Toronto report is one of several recent reports associating carbon nanotubes, or CNTs, with crumb rubber. But to date, the authors have not located any evidence that either tires or crumb rubber are made with CNTs. These reports may have confused CNTs with tire constituent carbon black, a totally different material. If CNTs become part of the allegations, crumb rubber may take on some aspects of asbestos litigation, because a series of articles have claimed that certain kinds of CNTs would act like asbestos in the human body.

***4** The studies and health department conclusions have not stopped the mounting criticism. In the last few years, allegations of a "cluster" of soccer players with cancer have appeared, and the number of players has grown to about 150 as more such case reports are identified.

While there is no evidence that these cancers are arising from contact with crumb rubber, that figure is frightening to a lay person and has helped generate the current interest. For example, the father of one such soccer/football player -- a former National Health Service chief executive -- is claiming in the U.K. media that his son's cancer was caused by crumb rubber.⁵

The media stories on NBC and other networks, followed by a Julie Foudy special on

ESPN, got nationwide attention. Two Democratic U.S. senators, Richard Blumenthal of Connecticut and Bill Nelson of Florida, demanded that the CPSC and EPA take action, and later wrote the White House to enlist its oversight. The resulting investigations are discussed below under the regulatory initiatives section. The first report likely to come out is a “status report” from the CDC’s Agency for Toxic Substances and Disease Registry, or ATSDR, at the end of this year.

What impact is all of this having? Many cities and communities around the country are increasingly faced with angry parent groups and others demanding alternative forms of infill or asking that warning signs be posted on synthetic turf fields. At least one such community did in fact put warning signs up.

Many other schools and communities are looking to replace grass fields and are faced with the complicated science and health claims as their boards and councils decide what to do. The pressure on this product and its users is going to increase exponentially in coming months as news trickles out from the various investigations and the media and members of Congress keep up the drumbeat.

The regulatory initiatives and likely course

Despite the studies above, several government agencies have been under pressure to take a closer look. The key concern is that the existing studies may not be sufficient to rule out possible harm, and many people understandably want agency declarations that crumb rubber is “safe” for their children to play on.

California’s OEHHA was the first to commit to a thorough investigation in mid-2015, with a focus on actual field sampling and preparation of a protocol for biomonitoring (but stopping short of taking actual biomeasurements). The EPA is assisting the OEHHA, which expects to complete the study in July 2018.

The CPSC responded to congressional requests by joining in a coordinated effort with the EPA and the CDC. The agencies have jointly announced a federal investigative plan that is focused on identifying the gaps in scientific information, in part because “the existing studies do not comprehensively evaluate the concerns about health risks from exposure to tire crumb.”⁶ The plan keys in on classifying the chemical compounds, potential emissions and their toxicity, as well as on identifying the likely pathways of exposure.

***5** The ATSDR has issued a public notice that in conjunction with the EPA it has begun the process of conducting two studies on crumb rubber, one to characterize field use of crumb rubber and testing of material and the second to explore possible exposure routes.

The CPSC prides itself on being a science- and data-driven agency. There is no mention of rulemaking in the current action plan, presumably because the scientific results will drive any decision with regard to agency action.

The plan for scientific action acknowledges that further work may be necessary before moving forward to regulate, including identifying potential biomarkers of exposure, collecting preliminary biomonitoring data, analyzing samples of recycled tire crumb used on playground surfaces, and evaluating the feasibility of conducting an epidemiologic study.

In its February 2016 budget request, the CPSC asked for an additional \$3 million earmarked for healthy children and the study of both nanotechnology in consumer products and crumb rubber in artificial turf fields and playgrounds.

Should the CPSC eventually determine that it should move forward with rulemaking to address a potential cancer risk from crumb rubber exposures, it would have to follow a specific statutory process and appoint a Chronic Hazard Advisory Panel, or CHAP, to study the issue and make recommendations.⁷

The CHAP panel would have to review the scientific data on toxicity and exposure to determine the carcinogenic risk and report its determination to the CPSC. Any regulatory action would occur by rulemaking after receipt of the CHAP report and peer review of the science behind any regulatory determination.

For these reasons, regulatory action at the federal level will not happen anytime soon. Years of scientific research and participatory process will inform any decision to move forward with rulemaking.

California, an important bellwether state on chemical exposure issues, could get out ahead of the federal government in taking action because they are not constrained to follow the disciplined CHAP process and scientific peer review required at the federal level.

In the interim, though, public statements of concern by agency heads and members of Congress, even if based on partial or flimsy science, could raise the risks of litigation and cause even more difficulties for schools and communities considering the use of crumb rubber fields.

The questions regarding crumb rubber have spread to Europe, with a series of recent articles in the U.K. and a recent call for investigation from the European Commission.

Litigation realities and defenses

To date, litigation involving crumb rubber synthetic turf has focused on lead in the grass itself. That litigation resolved in the mid-2000s when the manufacturers removed the lead content in new product.

A group of women's soccer players also filed a lawsuit before the last World Cup, but that lawsuit complained merely that the women were required to play on synthetic turf while

the men continued to play on grass. The alleged but unproven “cluster” of soccer players with cancer has not yet produced any litigation, and activity on the plaintiff websites remains modest.

*6 Nevertheless, the campaign against this product has many of the earmarks of orchestrated efforts to build consensus for litigation against the product. The congressional attention and pronouncements, calls for hearings, alleged clusters of victims, the declarations that all the existing studies are “inconclusive” or “inadequate,” and the media's version of events are all indicative of efforts to demonize targeted chemicals or products prior to the initiation of litigation.

Whether litigation ensues is still much in doubt. Litigants would face some substantial hurdles, first among them the lengthy series of independent studies and health board reviews finding no cause for concern.

It is also difficult to prove in court an actual link between cancer and a claimed exposure, and several factors make that difficulty even more problematic here. For instance, to date, the cancer claims have not focused on any one cancer or type of cancer but apparently include all forms of cancer. The plaintiffs' experts will face greater scrutiny if they cannot isolate a specific cancer resulting from a toxic exposure.

In addition, the typical latency between an exposure and cancer is decades, and crumb rubber has not been on the market long enough to connect these recent cancers with people using the fields only in the last few years.

Add to this the reality that no study to date has shown any releases of the carcinogenic materials in anything but highly inconsequential amounts. A lawsuit would require application of a rather extreme version of the “any exposure” theory to succeed.

A class action would be difficult to sustain given the different manufacturers, the potentially different content of crumb rubber material, the varying circumstances of exposure and the many alternative possible causes of cancer to consider.

Medical monitoring litigation would involve a large number of potential litigants/patients for monitoring, with no clear link to any single cancer and speculative claims of causation.

And the fields themselves are not an easy target -- they are beneficial for communities and schools, and they provide children a place for year-round exercise. Any mass replacement program would be enormously expensive for cash-strapped colleges, school districts and cities.

Similar hurdles, however, do not always stop litigation. If the investigations come back with strong statements of concern, or if an epidemiology study claims to find a link, crumb rubber litigation in some form could be upon us.

In the interim, the real burden of this storm of speculation about the product falls on the governments, schools and sports teams who have to deal with the accusations and threats to expensive fields that otherwise are providing many benefits.

Footnotes

- 1 David Brown, Env't & Human Health Inc., *Artificial Turf: Exposures to Ground Up Rubber* (2007).
- 2 Press Release, Synthetic Turf Council, *STC Statement: March 16, 2015* (Mar. 16, 2015), <http://bit.ly/1VsLSxf>.
- 3 Ronald Macfarlane, Christine Carrasco, Yusuf Alam & Joesphine Archbold, Toronto Pub. Health, *Health Impact Assessment of the Use of Artificial Turf in Toronto 7* (Apr. 2015), <http://bit.ly/1ZYyKiB>.
- 4 Elizabeth Denly, Katarina Rutkowski & Karen M. Vetrano, N.Y. City Dep't of Health & Mental Hygiene, *A Review of the Potential Health and Safety Risks from Synthetic Turf Fields Containing Crumb Rubber Infill* (May 2008).
- 5 See Emma Glanfield, *My teenage son's cancer was caused by artificial football pitches, says former NHS boss as he launches campaign to halt turf's use over fears they contain dangerous chemicals*, Daily Mail (Feb. 14, 2016, 10:34 PM), <http://dailym.ai/1Tk4Rr6>.
- 6 U.S. Env'tl. Prot. Agency, *Federal Research Action Plan on Recycled Tire Crumb Used on Playing Fields* (Feb. 18, 2016). <http://1.usa.gov/1YwgRHu>
- 7 See [15 U.S.C.A. § 2080](#).
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