



Trace-PIE-Group
Parents protest at Tr.

Artificial Lawn Turf Protest by Trace-PIE

This morning, Wednesday December 10 from 8:15am to 9am, many of the parents of Trace Elementary School in San Jose will be protesting in front of the school. They are trying to get the word out on health effects of the San Jose Unified District's choice to replace the grass field with artificial turf containing lead and other heavy metals. Beyond direct contact hazards, it will also out-gas various hazardous volatile organic chemicals, and on hot days will reach temperatures thirty or more degrees Fahrenheit hotter than nearby asphalt surfaces. Then there is the issue of the superbug MRSA, which has been found to live in the shredded tire substrate of the selected artificial turf. Safe commercial alternatives exist, yet our school district has ignored community uproar, ongoing scientific evaluations, and the warnings of Federal, State and Municipal school and parks systems across the country. Parents and community members have serious concerns that have gone unheeded. Community participation in the choice was promised, yet they have already announced their decision ahead of the vote this Thursday evening.

There are two components to the artificial turf. A carpet-like material with tall colored fibers is installed, then an in-fill of tiny particles is swept between the fibers to help them remain upright. The toxicity and disease issues arise from the choices of lead based pigment in the plastic fibers, and heavy metals, volatile organic chemicals, and other carcinogens in the shredded tire rubber planned on for in-fill. Because the rubber absorbs solar energy so well, surface temperatures have been seen from 150 to 170 degrees Fahrenheit on some days. The safety of our children is supposed to be paramount, yet the thermal and chemical exposure will certainly bring on respiratory, cognitive and long term health problems, as explained below. If we know all of this information, how can we in good conscience move forward?

The Center for Disease Control (CDC) recommends that children perform aggressive hand and body washing after playing on worn artificial fields. The Consumer Product Safety Commission is calling on manufacturers to stop using lead in their products. The blades of the turf use lead chromate as the yellow dye to provide a green surface. Lead is most dangerous for children under the age of six. Lead causes reduced IQ, brain damage, kidney damage, and other illnesses. Health officials say the main risk is cumulative exposure, and many believe that the only safe amount is zero. While it is unlikely that anyone will play on a turf lawn or field just once and receive an excessive lead exposure, the risk of health problems rises with repeated exposures.

In August of this year, the Centers for Disease Control (CDC) released a warning about potential lead exposures from turf, stating that "As the turf ages and weathers, lead is released in dust that could then be ingested or inhaled, and the risk for harmful exposure increases." One of the turf samples CEH found with high levels of accessible lead was obtained from the yard of a Bay Area elementary school that had the turf installed (3) years ago. At this time, the CDC says it does not yet fully understand the potential extent of lead exposure from worn artificial turf. Until it does, the agency says that some precautions can be taken to minimize any potential risk.

For example, field managers should consider implementing dust-suppression measures. And to protect the public, in particular young children, field managers should consider posting signs indicating that:

- >> After playing on the field, individuals are encouraged to perform aggressive hand and body washing for at least 20 seconds using soap and warm water.
- >> Clothes worn on the field should be taken off and turned inside out as soon as possible after using the field to avoid tracking contaminated dust to other places. In vehicles, people can sit on a large towel or blanket if it is not feasible to remove their clothes. These clothes, towels, and blankets should be washed separately and shoes worn on the field should be kept outside of the home.
- >> Eating while on the field or turf product is discouraged.
- >> Avoid contaminating drinking containers with dust and fibers from the field. When not drinking, close them and keep them in a bag, cooler, or other covered container on the side of the field.

In September of this year, the State of California filed suit against artificial turf manufacturers, who have failed to warn the public about the dangers of lead exposure from their products. The complaint alleges that the lead in their products gets on the skin of children and adults who play on artificial turf on athletic fields and other venues. Artificial turf contains lead chromate. Attorney General Jerry Brown filed the lawsuit Sept. 2 under California's Proposition 65, which says products that can expose consumers to reproductive toxins or carcinogens must carry a warning label. Lead has been on the list since 1987. The bottom line is this is 2008. Why are you making something with lead deliberately put into it? Commercial alternatives are available.

Until earlier this year, turf manufacturers told us their nylon-polyethylene blend safely encapsulated the lead chromate so there was no lead exposure risk. This summer multiple tests showed this to be false, and hundreds of fields around the country are being replaced. The same types of statements are now being made about their new polyethylene formulation, which has not been on the market long enough to evaluate after normal wear.

At the Synthetic Turf Council's May 6 press conference, Michael Dennis, GeneralSports Value's chairman, followed up his statement that "synthetic turf sports fields, including the nylon version brought into question, are completely safe and pose no risk to children or athletes" with news that GSV was working to create "heavy-metal-free or lead-free" products, adding, "I believe we'll evolve to ... absolute absence of heavy metals." Stephen Noe, president and CEO of Sportex Construction Services, this spring posted a note on the company's web site saying that it would discontinue manufacture of its "few colors ... produced using low levels of lead chromate-based pigments. ... We intend to substitute alternative colors based on non-heavy-metal-based pigments. ... Although we do not see a health risk in the current products, we believe that this is the best decision for all of our constituents." In other words, please buy our toxic inventory until we have developed our own non-toxic formulas.

Then there is the issue of the infill material, primarily made of ground up tire rubber. The tiny black particles are known to get in shoes, clothing, eyes, mouths, etc. A study conducted last year by Dr. William Crane of the City College of New York and Dr. Junfeng Zhang of Rutgers University determined that turf substrates contain polycyclic aromatic hydrocarbons (PAHs) and toxic metals. PAH's are chemicals created during the partial burning of, among other things, oil and gas. In the study, the levels of 6 PAHs found in the rubber pellets were above concentrations allowed by the New York State Department of Environmental Conservation (DEC). DEC requires removal of these substances at these levels from contaminated soils because the DEC considers them hazardous to public health. LA City Schools have removed the rubber pellets from their turf accessible to young children.

The Department of Health and Human Services Agency for Toxic Substances & Disease Registry (ATSDR) summarizes the danger: "Some people who have breathed or touched mixtures of PAHs and other chemicals for long periods of time have developed cancer. Some PAHs have caused cancer in laboratory animals when they breathed air containing them (lung cancer), ingested them in food (stomach cancer), or had them applied to their skin (skin cancer)." The PAH of greatest concern is benzopyrene, which was found on the artificial turf in levels 8 times greater than the DEC limit. Two researchers at the Department of Biochemistry of the University of Western Ontario have found that exposure to benzopyrene increases the incidence of breast cancer.

Benzopyrene is known to be mutagenic and highly carcinogenic and has been tracked crossing the placenta and attacking DNA. It also suppresses the gene that controls cell growth and has been linked to half of all human cancers and up to 70 percent of lung cancers. Dr. Patrick Kinney, a professor of environmental health sciences at Columbia University, succinctly acknowledges the potential health risk: "PAHs, if you breathe them, have been associated with lung cancer." Crane and Zhang also discovered levels of zinc in excess of DEC cap guidelines and the presence of toluene, lead, arsenic and cadmium. These toxic substances also are leached into ground water by rain, dew and other sources of water.

In the November/December issue of the Journal of Exposure Science and Environmental Epidemiology, a new study by researchers at the UMDNJ-School of Public Health finds that when children or athletes ingest the tiny rubber granules in synthetic turf, it is likely that a significant portion of the lead in the granules will be absorbed by their bodies' gastric fluids. Even though the samples had relatively low concentrations of lead in the rubber granules, we observed that substantial amounts of lead – 22.7 and 44.2 percent in the two samples tested – were absorbed into synthetic gastric juices. Even low levels of lead can cause neuro-cognitive problems – such as IQ loss and increased ADHD – in children. And the California OEHHA report (2007) summarized 46 studies in the scientific literature that identified 49 chemicals released from tire crumbs - seven of which are carcinogenic.

Direct temperature measurements conducted during site visits showed that synthetic turf fields can get up to 60° hotter than grass, with surface temperatures reaching 160°F on summer days. For example, on 6 July 2007, a day in which the atmospheric temperature was 78°F in the early afternoon, the temperature on a grass field that was receiving direct sunlight was 85°F while an adjacent synthetic turf field had heated to 140°F. "Exposures of ten minutes or longer to surface temperatures above 122°F can cause skin injuries, so this is a real concern," said Joel Forman, medical director of the Pediatric Environmental Health Specialty Unit at Mount Sinai School of Medicine, speaking at a 6 December 2007 symposium on the issue.

Many physical properties of synthetic turf—including its dark pigments, low-density mass, and lack of ability to vaporize water and cool the surrounding air—make it particularly efficient at increasing its temperature when exposed to the sun. This is not only a hazard for users, but also can contribute to the "heat island effect," in which cities become hotter than surrounding areas because of heat absorbed by dark man-made surfaces such as roofs and asphalt. And anyone with basic chemistry experience will remember that rates of reactions increase with heat, so the breakdown and out-gassing issues mentioned previously are accelerated drastically by the heat retention.

The NYC Health Department report says heat is the primary health concern associated with playing on fields with crumb rubber in-fill. It says people can suffer dehydration, heatstroke and thermal burns at field temperatures above 115 degrees. Based on these concerns, the New York City Parks Department has now decided to move away from using recycled-tire rubber in new turf fields. Commissioner Liam Kavanaugh says decisions have already been made. "We have two fields in construction where we've actually canceled the black crumb rubber and are actively looking for an alternative," Kavanaugh says.

If the threats of cancer and more toxic runoff into waterways are not enough reason to get people to reject artificial turf, perhaps a flesh-eating bacteria known as MRSA will do the trick. MRSA is a drug-resistant bacteria that can infect healthy people as well as hospital patients. It infects the skin and even the heart and central nervous system. MRSA begins as a lesion on the skin and can quickly lead to serious illness and death. Unfortunately, MRSA is becoming more prevalent among college and high school athletes and can be harbored on athletic equipment.

A recent study by the Centers for Disease Control found that athletes who had suffered artificial turf burns were seven times more likely to develop MRSA infection. The reason is partly that the burns open the skin to the opportunity for infection. But many studies, most notably the study conducted by the Journal of Clinical Microbiology in 2000, have found that MRSA survives better on artificial turf than on other surfaces. Specifically, the staphylococcus survives longest, up to 90 days, on polyethylene plastic, which is a plastic used in synthetic turf fibers.

One solution to this problem is, of course, to spray disinfectant. But that introduces yet another toxin to play areas and to open wounds. With natural grass, which has inherent antibacterial properties, no spraying and no MRSA concern would even be necessary.

Concerns over the potential for increased injuries associated with the use of synthetic turf systems have led to a number of studies among athletes to evaluate any differences in injury rates, injury types, and lost time between synthetic and natural turf materials. These studies have shown either no major differences in the incidence, severity, nature or cause of injuries sustained on natural grass or synthetic turf by men or women, or that injury rates are similar but that the type of injury varies between the two surfaces.

As we continue to pave the earth, we find our climates shifting warmer and more unhealthful. Benefits of a natural grass surface include cooling by transpiration, removing dust by incorporating it into the soil, releasing oxygen and sequestering the equivalent of many hundreds of trees worth of carbon dioxide. If we utilize some of the excess reclaimed water supplied by the water reclamation plant (Purple pipe), we will reduce the de-salinification occurring in the southern San Francisco bay.

An interesting fact is that the District has thus far chosen to perform none of the manufacturers recommended maintenance on their installations of artificial turf to date. Local District schools visited have none of the biological disinfectants recommended in case of accidents bodily fluids, animal droppings, etc. The raking and redistributing of infill has not been performed either, causing premature wear in several cases. What do you think will happen to the product's warranty without proper upkeep? Beyond that, the lifetime of these surfaces is 8 to 10 years. Properly maintained grass surfaces provide closer to 20 years before replacement. Do we have the budget to replace the turf in another 8 years.

Natural turf is preferred by 88% of NFL players, and 96% believe that artificial turf contributes to injuries. Since 1991, 18 new major league baseball stadiums have been built, all with natural grass. The older stadiums have removed the synthetic turf, and today only 3 major league baseball stadiums with synthetic turf are in use, with two of those to be replaced with new natural grass stadiums in the near future. Maintenance and injury are often cited, and most players simply prefer real grass. All 7 future ballparks currently in development will have natural grass. It is clear that major league baseball has abandoned synthetic turf.

If artificial turf is necessary for some reason, there are materials that do not have these toxicity issues. One new alternative is infill made from plant-derived materials. Synthetic turf manufacturer Limonta Sport produces Geo Safe Play, an infill made from coconut husks and cork. In Europe there are multiple sources of lead-free turf products to meet their more stringent toxicity requirements. Of course, US turf manufacturer's lobbies continue to spout that their current products are safe, while racing to develop new products that will meet upcoming safety standards.

Time and again we apply the judicial model of innocent until proven guilty in non-legal contexts, such as those involving human and environmental health. We hold that a product is not hazardous to our health until scientific evidence definitively shows that it is. The pitfalls of this way of thinking are obvious. When it comes to certain substances, such as those that contain known carcinogens, I prefer to follow a different model: that of assuming something involving chemicals is hazardous until scientific evidence proves that it is not.

In the case of artificial turf, plenty of scientific evidence has, to the contrary, shown that it is hazardous in at least three significant ways: it harbors bacterial infection, it exposes humans and animals to carcinogens, and it contaminates aquifers and drinking water. Any one of those three reasons should be more than enough to convince everyday lobbyless citizens to oppose the installation of artificial turf fields in their communities. Please do not put our children and environment at risk.

Steve Zavala
San Jose, CA
408 219 1018