

**CORRESPONDENCE
FROM MARCH 24, 2026,
AND JUNE 23, 2026,
MUNICIPAL SERVICES
COMMITTEE MEETING**

Letter from League of Women Voters for the Pasadena Area

From Cynthia Cannady

Date Thu 3/19/2026 1:28 PM

To Gao, Beilei <bgao@cityofpasadena.net>

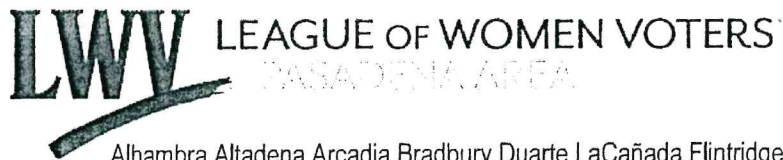
 1 attachment (277 KB)

Artificial Turf_LWVPA_031926.pdf;

[A] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you *know* the content is safe. Report phish using the Phish Alert Button. For more information about the Phish Alert Button view article "KB0011474" on the DoIT portal.

Please accept the attached letter as correspondence for the 03/24/26 meeting of the Municipal Services Committee. This concerns the artificial turf issue and we don't yet have the agenda number.

For Martha Zavala, Advocacy Director



Alhambra Altadena Arcadia Bradbury Duarte LaCañada Flintridge Monrovia Monterey Park
Pasadena San Gabriel San Marino Sierra Madre South Pasadena

March 19, 2026

Pasadena City Council
City Hall
100 N. Garfield Avenue
Pasadena, California 91109

Public Information Needed on Environmental and Health Risks of Synthetic Turf

Dear Mayor Gordo and Members of the Pasadena City Council,

The League of Women Voters of Pasadena Area respectfully urges the Council to ensure that the public has full access to current, science-based information regarding the potential environmental and health risks associated with synthetic (artificial) turf, currently installed and proposed for our city parks, schools, and recreation areas.

As an organization deeply committed to informed public participation and evidence-based decision-making, we believe that community members deserve a clear, transparent understanding of the environmental and health implications of this issue. Information should address at least the following areas of concern:

Health Impacts, Especially for Children

Research continues to raise questions about potential exposure to PFAS, toxic substances, heat-related illness, and injury on artificial surfaces. Children, who spend significant time in close contact with these fields, are particularly vulnerable. It appears that reputable sources disagree on the nature and gravity of the risk, but we should not take chances with our children. At the least, we propose that full disclosure on potential health risks be disclosed and a city-wide information meeting be held before a decision is taken. Parents deserve to know about potential health risks to their children and have an opportunity to express their view before this body takes a decision.

Contribution to Greenhouse Gas Emissions

Synthetic turf is derived primarily from petroleum-based plastics. Its production, transportation, and eventual disposal contribute to greenhouse gas emissions at a time when municipalities are seeking to reduce their carbon footprint.

Heat Island Effect

Installation of artificial turf is known to increase temperatures in urban areas. Pasadena is already a high heat risk city and Northwest Pasadena is acknowledged to be an "urban heat island" characterized by higher temperatures due to dense development, asphalt, limited tree canopy and historical factors including land use policies.

Waste and End-of-Life Disposal

Artificial turf cannot currently be recycled at scale. Once worn out, typically within a decade or less, it becomes a significant source of non-recyclable waste headed for landfills. Its disposal accounts for major greenhouse gas emissions. What will happen to these plastic materials when children have played on them for years and they need to be replaced?

Water Pollution and Environmental Runoff

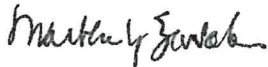
The breakdown of turf materials and infill releases microplastics and chemicals into surface water and stormwater systems, potentially affecting watershed health and local ecosystems. It ends up in the ocean, which is already polluted with plastic.

The League encourages the City Council to consider all of these risks and decline to authorize installation of artificial turf in public parks.

In any case, in the name of democracy, we urge you to offer and publicize a public forum on the topic, inviting critics and defenders. The public, especially parents of minor children, have a right to know and express their views before a decision is taken.

Thank you for your attention and your commitment to ensuring fully informed public decision-making in Pasadena.

Respectfully,



Martha Zavala
Director of Advocacy
League of Women Voters Pasadena Area



Letter of support for artificial turf, Item 2, MSC Meeting 2026-03-24

From Gary Lai
Date Fri 3/20/2026 10:23 AM
To cityclerk <cityclerk@cityofpasadena.net>

1 attachment (69 KB)

Letter of support for artificial turf ban-City of Pasadena.pdf;

You don't often get email from [Learn why this is important](#)

[A] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you **know** the content is safe. Report phish using the Phish Alert Button. For more information about the Phish Alert Button view article "KB0011474" on the DoIT portal.

Hello,
Please attach this letter of support for the banning of artificial turf as a public comment for Item #2, Municipal Services Committee meeting on 3/24/2026.

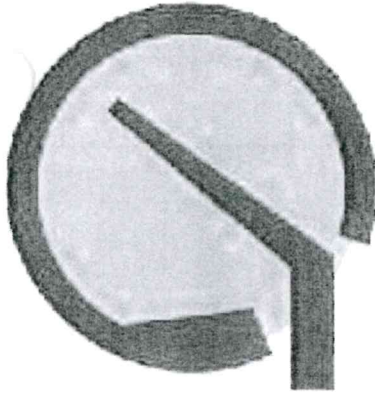
Thank you.
-Gary Lai



Gary J. Lai, CA PLA 4054, LEED AP BD+C
Principal and Founder
Pasadena, CA



Past-Chair of the Board



QUIXOTIC
NATURE-BASED SOLUTIONS

Gary J. Lai

ASLA, LEED AP BD+C

Principal

California License PLA 4054

City Clerk of the City of Pasadena
Municipal Services Committee
City of Pasadena

March 20, 2026

RE: Letter of support for proposed artificial turf ban

To: Municipal Services Committee

As a landscape architect and sustainability expert with over 35 years of experience based in Pasadena, I strongly support any initiative aimed at curbing the use of artificial turf within the City of Pasadena.

The utilization of artificial turf in both residential and commercial settings poses significant environmental challenges. It contributes to soil erosion and exacerbates the effects of extreme heat, while failing to provide the advantages of natural materials in terms of evaporative cooling, stormwater infiltration, and carbon sequestration.

While it is essential to evaluate all turf areas and restrict their use to essential activities such as sports and recreation, artificial turf compounds the environmental impact by negating the positive effects of natural materials. Even in the context of water conservation, artificial turf necessitates irrigation systems to maintain a cool surface temperature, even during moderately hot days. For instance, the high temperatures experienced in recent weeks (March 2026) render an unirrigated artificial sports field unusable and unsafe due to the excessive heat generated by the field materials and the risk of severe burns.

In summary, artificial turf is more costly to install, requires ongoing maintenance, and consumes water while failing to offer the benefits associated with natural materials.

Sincerely,

Gary J. Lai, PLA, ASLA, LEED AP BD+C
Adjunct Faculty, CalPoly Pomona, Landscape Architecture

Comments on 24 March 2026 Municipal Services Committee

From Joan Aarestad

Date Fri 3/20/2026 10:30 AM

To cityclerk <cityclerk@cityofpasadena.net>

 1 attachment (21 KB)

Artificial Turf MSC 24 Mar 2026.pdf;

[You don't often get email from Learn why this is important at
<https://aka.ms/LearnAboutSenderIdentification>]

[△] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you know the content is safe. Report phish using the Phish Alert Button. For more information about the Phish Alert Button view article "KB0011474" on the DoIT portal.

Please provide these comments to the Municipal Services Committee.

To the Municipal Services Committee:

Re: 24 March 2026 Meeting
Agenda Item 2 Informational Only Artificial Turf

I am the Chair of the Sustainability Committee for Pasadena Beautiful Foundation. On past occasions, we have taken the position before the Environmental Advisory Commission that the City of Pasadena should not support the use of artificial turf. We are renewing that position before this Committee.

We would still like the following topics to be reviewed with reference to synthetic turf:

Pros

- Reduces the use of water in maintaining urban landscapes

- Reduces cost/time/energy of maintaining a living lawn

- Allows for more days of use of fields

Cons

- Smothers complex ecosystems in the soil that foster better environmental health

- Does not reduce the use of water due to need to cool material

- Made of plastics that break down into microparticles that cause health problems

- Artificial turf is not recycled so becomes solid waste in landfills

- Turf temperatures reach dangerous levels in hot weather which can cause burns

- Additional costs/expenses due to electronics that require updates and become obsolete prior to the end of the useful life of the turf

We had previously asked for staff to provide us with the most recent technological assessments and financial analysis of the expenditures so that you as our elected representatives can make informed decisions. Once these topics are evaluated, we anticipate that artificial turf will be seen as NOT the most cost effective choice. And this does not even take into consideration health risks to vulnerable children.

This is perhaps a seminal moment to see whether our elected officials are truly committed to making the City of Pasadena a leader in environmentally appropriate decisions or not.

On a personal note, I am old enough to remember the searing pain I experienced in my lungs as a child playing on grass fields during the dark air quality days of the 1960s. It took massive efforts to improve our air quality so that my children did not experience that pain.

It is ironic that though our air quality is much improved from emissions, we are turning a blind eye to other forms of pollution from micro-plastics that children breathe in from artificial turf.

I hope this Committee has the strength to make the best decision for our community.

Respectfully submitted

Joan E. Aarestad
Chair, Sustainability Committee
Pasadena Beautiful Foundation

Comment on Artificial Turf Installation

From Ryan Kim

Date Fri 3/20/2026 4:38 PM

To Gao, Beilei <bgao@cityofpasadena.net>

You don't often get email from

1. [Learn why this is important](#)

[A] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you **know** the content is safe. Report phish using the Phish Alert Button. For more information about the Phish Alert Button view article "KB0011474" on the DoIT portal.

To the Municipal Services Committee,

My name is Ryan Kim, and I am a sophomore who lives and attends high school in Pasadena. I am deeply concerned by the proposal to replace the natural grass fields at Robinson Park and Villa Parke with artificial turf.

I first learned about the impacts of plastics on human and environmental health in eighth grade, and what I found was alarming. Artificial turf contains chemicals — including PFAS, polycyclic aromatic hydrocarbons (PAHs), and heavy metals such as zinc and lead — that are well-documented to cause cancer and hormonal disruption. Beyond chemical exposure, turf surfaces heat to dangerously high temperatures on sunny days; a friend of mine found that his trash can had melted onto his backyard turf after a warm afternoon. And the abrasive surface itself causes friction burns: my brother, who plays soccer, regularly comes home with skinned knees from sliding on artificial turf fields. These are the impacts of installing artificial turf.

Environmentally, the harms are also significant. Turf blades shed microplastics that enter stormwater, flow into the Arroyo Seco, and eventually reach the LA River and the Pacific Ocean, where they harm marine wildlife and accumulate in ecosystems. Beneath the field, turf sterilizes the soil and disrupts the roots, moisture, and microbial life that trees and plants in the surrounding area depend on. And the manufacturing of artificial turf carries a substantial carbon footprint — studies have found that synthetic turf generates several times the lifecycle emissions of natural grass per square meter installed.

For these reasons, I urge the committee to reject the installation of artificial turf at these facilities.

Ryan K. Kim (he/him)

Polytechnic School

"Be who you are and say what you feel, because those who mind don't matter, and those who matter don't mind."

— Bernard M. Baruch

Public Comment - MSC Item #2 (March 24, 2026): In Support of Real Grass Fields

From Christopher Yeh

Date Fri 3/20/2026 5:30 PM

To cityclerk <cityclerk@cityofpasadena.net>; Gao, Beilei <bgao@cityofpasadena.net>

Cc Lyon, Jason <jlyon@cityofpasadena.net>

You don't often get email from

[Learn why this is important](#)

[A] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you **know** the content is safe. Report phish using the Phish Alert Button. For more information about the Phish Alert Button view article "KB0011474" on the DoIT portal.

Dear Members of the Municipal Services Committee,

As a Pasadena resident, I am writing to express my strong support for the installation and maintenance of natural grass fields over artificial turf in our local parks and athletic facilities.

While I understand the desire for low-maintenance solutions, the long-term environmental, health, and safety costs of synthetic surfaces far outweigh their perceived convenience. I urge the committee to consider the following points:

1. Public Health and Safety

Extreme Heat: Artificial turf can reach temperatures between 140°F and 180°C, creating a significant risk for heat exhaustion and burns. In contrast, natural grass provides cooling through evapotranspiration.

Injury Risk: Studies consistently show higher rates of ACL tears and "turf burns" on synthetic surfaces due to increased friction and surface stiffness compared to the natural "give" of soil and grass. I myself have experienced several turf burns over the years.

Chemical Exposure: Many turf systems use rubber infill from recycled tires, which may contain heavy metals. Our residents should not be exposed to these harmful substances.

2. Environmental Impact

Microplastic Pollution: Turf fields shed plastic fibers and rubber particles that inevitably enter Pasadena's stormwater systems and local waterways.

Ecosystem Services: Unlike synthetic plastic, natural grass absorbs carbon dioxide, produces oxygen, and supports local biodiversity.

Stormwater Management: Natural soil acts as a filter and sponge. Replacing it with compacted layers for turf increases urban runoff and heightens local flooding risks.

3. Sustainability and Waste

Artificial turf fields have a short lifespan of 8-10 years and are notoriously difficult to recycle. Most end up in landfills as massive piles of non-biodegradable, petroleum-based waste. By choosing drought-tolerant natural grass suited for our climate, Pasadena can demonstrate a commitment to true environmental stewardship.

I believe Pasadena has the opportunity to lead by example, utilizing modern turf management techniques to maintain high-quality, water-efficient natural fields that protect both our children and our environment.

Thank you for your time and for your dedication to our community's well-being.

Sincerely,
Christopher Yeh
Pasadena Resident, District 6

Please vote no against plastic fields

From Lissette Rodriguez >
Date Fri 3/20/2026 8:02 PM
To Gao, Beilei <bgao@cityofpasadena.net>

You don't often get email from . [Learn why this is important](#)

[A] **CAUTION:** This email was delivered from the Internet. Do not click links or open attachments unless you **know** the content is safe. Report phish using the Phish Alert Button. For more information about the Phish Alert Button view article "KB0011474" on the DoIT portal.

Hi,

As a Pasadena resident and homeowner who is concerned about the future of our city, I urge you to vote no against investing any more money into plastic fields. They are harmful to the environment, can pose long term risks to people's health, and are just a bad idea.

Thank you,

Lissette Rodriguez

Pasadena, 91106

Public Comment-MS C Item #2-Keep it real, Pasadena

From Kaly

Date Sat 3/21/2026 6:38 PM

To Gao, Beilei <bgao@cityofpasadena.net>

You don't often get email from

1. [Learn why this is important](#)

[A] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you *know* the content is safe. Report phish using the Phish Alert Button. For more information about the Phish Alert Button view article "KB0011474" on the DoIT portal.

Please do not install artificial turf in Pasadena parks, playing fields, and anywhere children and young people play.

The Icahn School of Medicine has detailed harms to people's health from being on these surfaces at all ages, but especially for young people.

"The Children's Environmental Health Center of the Icahn School of Medicine at Mount Sinai strongly discourages the installation of artificial turf playing surfaces and fields due to the uncertainties surrounding the safety of these products and the potential for dangerous heat and chemical exposures. In addition, recent studies demonstrating the presence of PFAS and microplastics in these products raise significant concerns for both human health and environmental contamination."

These installations will be harmful to everyone.

Thank you,
Kaly Trezos

Public Comment - MSC Item #2

From

Date Sun 3/22/2026 11:55 AM

To Gao, Beilei <bgao@cityofpasadena.net>

You don't often get email from

[Learn why this is important](#)

[A] **CAUTION:** This email was delivered from the Internet. Do not click links or open attachments unless you *know* the content is safe. Report phish using the Phish Alert Button. For more information about the Phish Alert Button view article "KB0011474" on the DoIT portal.

Dear Committee Members:

This email expresses my concerns over the use of plastic astroturf "grass" in Pasadena.

Astroturf seems like an economical product to use in that it appears to lower maintenance costs; however, there are other costs that out way this "benefit."

As you are well aware of the litigious nature of our society, I can see the increased use of astroturf in Pasadena as a potential target for future litigation for the City from an environmental and personal injury perspective.

In addition to heavy metals and polyaromatic hydrocarbons (PAHs), astroturf contains per- and poly-fluoralkyl substances (PFAS), which can be found in the backing and "grass blades." A 2024 study completed by Public Employees for Environmental Responsibility (PEER) found that three out of four soccer players or coaches were coated in PFAS after playing on artificial turf. While the toxicity of PFAS continue to be studied, its effect on the developing bodies of young children is something we shouldn't discount when considering overall costs.

Chemicals in astroturf can also leach off of the product and contaminate water sources. These artificial covers also impede water infiltration and can contribute to flooding in areas that haven't been designed to absorb additional flow.

Accidents from sports played on astroturf are also a consideration. In her September 19, 2023 article, "Injuries Related to Artificial Turf," Katerina Kerska, from the National Center for Health Research states that there is an increase in ACL and ankle injuries, concussions, abrasions, and heat related injuries when athletes play on artificial surfaces.

These are but a few of the many articles that speak to the issues regarding astroturf. In my opinion, as a 50 year resident of Pasadena, the costs of using this product do not outweigh the "benefit."

Sincerely,
Dianne Franks

Villa Parke Turf Field

From Clara Carmichael

Date Sun 3/22/2026 2:43 PM

To Gao, Beilei <bgao@cityofpasadena.net>

You don't often get email from

[. Learn why this is important](#)

[A] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you *know* the content is safe. Report phish using the Phish Alert Button. For more information about the Phish Alert Button view article "KB0011474" on the DoIT portal.

To Whom It May Concern,

I go to high school in Pasadena, and I am concerned that Pasadena's Municipal Services Committee is being asked to replace the synthetic turf field at Villa Parke with turf instead of grass. A grass field would serve our community much better for many important reasons.

Artificial fields release microplastics which do not break down--- they break *up* into smaller and smaller pieces that can take centuries to eliminate. These microplastics pose serious environmental and health threats to your constituents. I hope that when making this decision Pasadena's MSC will play the long game. Young people like me are counting on you to prioritize giving the athletes who play at Villa Park a better future over the few minor inconveniences that come with grass fields.

I have played soccer in Pasadena for years with AYSO Region 13 and TFA Club, and I know that it is very uncomfortable to play on turf fields. The sun warms the plastic grass to high temperatures making the bottom of my cleats heat up. After the games, my feet will be pink and raw from being scalded every time I take a step. It is not a fun experience. My team and I are always disappointed when we hear that we will be playing a game on a field made of artificial grass. The fans and parents are equally averse because of the sweltering heat on turf sidelines.

The point of an athletic facility is to serve the athletes that play there and the community; to foster a safe and fun athletic environment. By that logic, I urge you to replace Villa Parke's turf field with real grass.

I appreciate all that you do to listen to young people like me who are directly affected by your choices.

Thank you for your time and consideration,
Clara

Clara Carmichael
Polytechnic School
Class of 2029
She/Her/Hers

Public Comment - MSC Item #2 - Keep it real, Pasadena!

From Eileen Hsu

Date Sun 3/22/2026 6:39 PM

To Gao, Beilei <bgao@cityofpasadena.net>

You don't often get email from

[Learn why this is important](#)

[A] **CAUTION:** This email was delivered from the Internet. Do not click links or open attachments unless you **know** the content is safe. Report phish using the Phish Alert Button. For more information about the Phish Alert Button view article "KB0011474" on the DoIT portal.

Dear City Council of Pasadena,

Good day to you. I'm writing to urge you not to use synthetic turf. The only thing it offers is a temporary illusion of green turf, except that it is anything but and comes with high environmental, public health, and taxpayer costs. Even Pasadena's own Turf Removal Program (<https://pwp.cityofpasadena.net/turfreplacement/>) strongly discourages and strictly prohibits rebate from the use of synthetic turf for all of the reasons that my fellow Pasadena residents who oppose it list. (repeated below for your convenience.)

If cost of maintenance of real turfs is high, increase the field reservation prices. If people complain, cite the very real climate change, decreasing availability of water, and increasing cost of living. That's the truth.

Synthetic turf is the lie.

Fake fields are hotter

- Artificial turf can reach 140–180°F on hot days, which we're seeing more and more of.
- These temperatures increase risk of burns and heat-related illnesses (heat exhaustion, heat stroke), especially for children and athletes.
- Grass fields stay significantly cooler due to evapotranspiration.

Fake fields produce microplastic pollution

- Turf fields shed microplastics as fibers and rubber infill break down.
- These particles enter stormwater systems, waterways, and eventually the ocean.

- Microplastics are now found in air, water, soil, and human bodies, raising long-term health concerns.

Fake fields expose park users to harmful chemicals

- Many turf systems use crumb rubber infill made from recycled tires, which can contain:
 - Heavy metals (e.g., lead, zinc)
 - PAHs (polycyclic aromatic hydrocarbons)
- While research is ongoing, there is increasing concern about chronic exposure, especially for youth athletes.

Fake fields provide no environmental benefits

- Unlike grass, artificial turf:
 - Does not absorb carbon dioxide
 - Does not produce oxygen
 - Does not support biodiversity
- It replaces living ecosystems with non-recyclable, petroleum-based materials.

Fake fields increase stormwater / flooding risk

- Natural soils absorb and filter water.
- Turf fields are typically installed over compacted layers that reduce infiltration.
- This can increase urban runoff, increasing local flooding risk and pushing pollutants into local waterways.

Fake fields pose long-term waste and environmental problem

- Artificial turf fields typically last 8–10 years.
- Fields are made from non-biodegradable plastics—most end up in landfills.
- Turf is made from fossil fuels and requires energy-intensive manufacturing.
- Replacement cycles mean repeated carbon emissions and material use.

Fake fields pose greater injury risks

- Studies have found higher rates of certain injuries (e.g., ACL tears, turf burns) on artificial surfaces.
- Turf can create more surface friction and stiffness than natural grass.

Real grass is a time-tested, cooler, safer, and healthier option

- Modern grass field management (e.g., improved drainage, drought-tolerant species) can:
 - Reduce water use
 - Support year-round play
 - Deliver environmental and cooling benefits

Thank you for your attention,
Eileen Hsu

, Pasadena, CA 91106

Villa Parke Turf Field

From Benjamin Heuer

Date Sun 3/22/2026 8:22 PM

To Gao, Beilei <bgao@cityofpasadena.net>

You don't often get email from

[Learn why this is important](#)

[A] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you *know* the content is safe. Report phish using the Phish Alert Button. For more information about the Phish Alert Button view article "KB0011474" on the DoIT portal.

To Whom It May Concern,

I go to high school in Pasadena, and I am concerned that Pasadena's Municipal Services Committee is being asked to replace the synthetic turf field at Villa Parke with turf instead of grass. A grass field would serve our community much better for many important reasons.

Artificial fields release microplastics which do not break down--- they break *up* into smaller and smaller pieces that can take centuries to eliminate. These microplastics pose serious environmental and health threats to your constituents. I hope that when making this decision Pasadena's MSC will play the long game. Young people like me are counting on you to prioritize giving the athletes who play at Villa Park a better future over the few minor inconveniences that come with grass fields.

I have an artificial turf yard at home and have had multiple trash cans and other plastic devices melt onto the grass when the temperature rises. I have (luckily) not really had to go on the grass barefoot or in minimal foot covering but can imagine how tough that can be, given that plastic has melted onto it. Those days of extreme heat, I generally avoid playing on the grass outside for fear of my feet burning. The point of installing artificial turfs is to minimize the minor inconveniences provided by organic grass, but in hot places like SoCal and Pasadena, artificial turf can easily go unused because of our climate.

The point of an athletic facility is to serve the athletes that play there and the community; to foster a safe and fun athletic environment. By that logic, I urge you to replace Villa Parke's turf field with real grass.

I appreciate all that you do to listen to young people like me who are directly affected by your choices.

Thank you for your time and consideration.

Ben Heuer

(he/they)

Class of 2029

Polytechnic School



Public Comment for MSC 3/24/26

From Heather Robb

Date Mon 3/23/2026 8:01 AM

To Gao, Beilei <bgao@cityofpasadena.net>; cityclerk <cityclerk@cityofpasadena.net>

You don't often get email from

[Learn why this is important](#)

[A] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you *know* the content is safe. Report phish using the Phish Alert Button. For more information about the Phish Alert Button view article "KB0011474" on the DoIT portal.

Hello there,

My name is Heather Robb. I live in District 3, and have served as the "at large" commissioner on the EAC for the past three years. I am writing about Agenda item #2, Artificial Turf at Athletic Fields and City Parks. As an environmental advocate and a Pasadena parent, I am writing to voice my **STRONG OPPOSITION** to the continued use of Artificial Turf in Pasadena's parks and athletic fields. There are so many arguments against its usage, so as the former head of the EAC's water subcommittee, I'd like to focus on its detrimental impacts on our ground water and drinking water.

Ground Water: Since artificial turf is essentially a plastic rug, it prohibits our soil from naturally absorbing rain water. Instead, the water runs off it and is swept away into our storm drains. As Pasadena works towards water independence, we need more opportunities to recharge our groundwater, and the use of artificial turf is in direct opposition to this goal.

Drinking Water: As Artificial Turf ages and breaks down, it pollutes our soil and water with microplastics and PFAS. Pasadena's drinking water is excellent, we have so much to be proud of with our treatment center, and recent testing showed that PFAS are not currently detected in our water. But the continued use of artificial turf will make that more difficult to maintain, and the dangers of both microplastic and PFAS are well-documented.

I urge you to protect the future of Pasadena's water supply, and vote to **BAN** the continued use of Artificial Turf in our parks and athletic fields.

Thank you,
Heather Robb



Public comment on artificial turf

From Suzanne York

Date Tue 3/24/2026 7:48 AM

To Gao, Beilei <bgao@cityofpasadena.net>

[A] **CAUTION:** This email was delivered from the Internet. Do not click links or open attachments unless you *know* the content is safe. Report phish using the Phish Alert Button. For more information about the Phish Alert Button view article "KB0011474" on the DoIT portal.

To the Members of the Pasadena Municipal Services Committee,

I am writing to respectfully urge you to reject any current or future artificial turf projects in Pasadena—including new installations, replacements, and maintenance contracts.

As more data emerges, concerns about the health and environmental risks of artificial turf continue to grow. Artificial turf is not simply "plastic grass"—it is a complex system made up of synthetic fibers, infill (often crumb rubber from recycled tires), and chemical treatments. Studies have identified hundreds of chemicals in these materials, including polycyclic aromatic hydrocarbons (PAHs), phthalates, and PFAS, so-called "forever chemicals"—many of which are known carcinogens, neurotoxins, and endocrine disruptors.

PFAS in particular are deeply concerning. These chemicals persist in the environment and in our bodies, and have been linked to immune dysfunction, developmental harm, and increased cancer risk. Artificial turf also contributes to microplastic pollution, contaminates surrounding soil and waterways through runoff, and creates hotter surface temperatures that can endanger users.

While some studies suggest limited direct evidence of harm, the scientific consensus is clear on one critical point: **there are significant gaps in long-term health research**, especially regarding cumulative exposure, particularly for children, who are more vulnerable. In the face of such uncertainty, the precautionary principle should guide public decision-making.

At the same time, Pasadena has not fully explored the potential of natural turf as a viable, forward-looking alternative. Advances in turfgrass science, such as the work being done at the University of California, Irvine, are developing more resilient, drought-tolerant grass systems that can dramatically reduce water use while maintaining durability. These innovations offer a path toward fields that are not only safer and cooler, but also more environmentally sustainable and cost-effective over their full lifecycle.

Real grass fields provide natural cooling, support biodiversity, avoid plastic waste, and eliminate the ongoing exposure to synthetic chemicals. With proper investment and modern management practices, they can meet Pasadena's recreational needs without placing our children, our communities, and our environment at unnecessary risk.

Pasadena has long been a leader in environmental stewardship. This is an opportunity to lead again- by choosing solutions that prioritize health, sustainability, and long-term fiscal responsibility.

I urge you to do the only right thing: **reject artificial turf projects and commit to exploring and investing in safer, natural alternatives.**

Respectfully,

Suzanne York, resident, District 2 and member of Pasadena Environmental Advisory Commission



Outlook

Letter to the Municipal Services Committee for 3/24/26 meeting

From Vanessa Alexander**Date** Tue 3/24/2026 9:12 AM**To** cityclerk <cityclerk@cityofpasadena.net>

1 attachment (43 KB)

Artificial Turf Athletic Fields Letter.VWA.3.24.26 (4).pdf;

You don't often get email from

[earn why this is important](#)

[A] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you *know* the content is safe. Report phish using the Phish Alert Button. For more information about the Phish Alert Button view article "KB0011474" on the DoIT portal.

Please find attached my letter in support of the Environmental Advisory Commission's recommendations regarding artificial turf on Pasadena's athletic fields.

Municipal Services Committee

RE: Artificial Turf Athletic Fields at City Parks

March 24, 2026

Dear Members of the Municipal Services Committee,

I am writing to express my strong support for the recommendations of the Environmental Advisory Commission regarding the use of artificial turf in the City of Pasadena. As a Pasadena resident and mother of two children actively participating in sports (AYSO, Pasadena Southwest Little League, and high school cross country and track) – I have avidly followed reports on the health and environmental dangers presented by the adoption of artificial turf.

However, you don't need to read the reports to understand just how miserable it is for the children (and their families) when natural grass is replaced by artificial turf. Games are routinely canceled (or playing periods shortened) due to extreme heat on the field. Even when the threshold for cancellation is not met, the experience is brutal. An 80-degree game on grass is delightful, but on turf it is trying and the impact is compounded as the temperature rises.

At track meets, coaches race to claim any available patches of grass to place the team pop-up tent to try to mitigate heat exposure throughout the day. At a February track meet (temperatures in the mid-80s) my son had to wait on the turf field in the midday sun for almost an hour before his race and suffered from heat exhaustion.

The abrasion risk is all too real– a fall or slide on turf (a weekly occurrence when your child plays goalie) causes a scrape akin to road rash which needs to be scrubbed out vigorously to avoid potential infection from myriad substances.

The crumb rubber fill and plastic blades don't just stay on the field—they come home in shoes, socks, and shin guards. They are all over my car, in my laundry, and on my driveway where they wash into the storm drainage system and pollute local waterways and the ocean.

Artificial turf fields promise increased playability and reduced water usage with minimal risk. In reality, turf may prevent a few weeks of rainouts, but extreme heat makes many days, especially in our warmer months, unsafe or miserable to play. Our children deserve safer surfaces to play on: real grass is better for their health and our environment.

Thank you for considering the Environmental Advisory Committee's recommendations and prioritizing the health and safety of Pasadena's children and the well-being of our shared environment.

Sincerely,

Vanessa Alexander

Pasadena, CA 91105



Outlook

MSC Public Comment - Agenda Item #2 - Artificial Turf Fields

From Wesley Reutimann ·**Date** Tue 3/24/2026 11:32 AM**To** Gao, Bellei <bgao@cityofpasadena.net>**Cc** Kristin Reutimann

[A] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you *know* the content is safe. Report phish using the Phish Alert Button. For more information about the Phish Alert Button view article "KB0011474" on the DoIT portal.

Good afternoon Chair and Members of the Municipal Services Committee,

As a Pasadena household with two young children who participate in local sports leagues, we are writing to urge the City to adopt a moratorium on further use of artificial turf fields.

As climate change drives more frequent and intense heat waves, investing in materials that exacerbate heat is inconsistent with Pasadena's public health and climate resilience goals. The recent March heat wave across Southern California underscores an immediate and growing public health threat to Pasadena residents, especially children and older adults, extreme heat. Artificial turf fields reach significantly higher surface temperatures than natural grass, often becoming dangerously hot during periods of elevated ambient temperatures. This not only limits their usability during an increasingly long part of each year, it increases the risk of heat-related illness for youth and adult athletes alike.

Artificial turf is a plastic product without a viable path for reuse. Often marketed as sustainable, **plastic is not recyclable at end-of-life.** There is presently no financial market for it. At best plastic materials such as water bottles can be downcycled (i.e. they require new fossil fuels to be repurposed, in contrast to say a glass or aluminum can). However the economics to downcycle plastic are not favorable, a major reason why 90% of "recyclable" plastic water bottles end up in landfills in California. Plastic fields are even more difficult to repurpose, with most ending up in landfills where they leave a further toxic legacy.

The question before the City is not only about safety from heat and chemical exposure, but about broader environmental sustainability, lifecycle impacts, and community health.

Rather than spend almost a million dollars to commit the City to another decade of plastic pollution, now is the time for the Council to chart a cooler course and provide children in some of the city's hottest, highest-need neighborhoods with access to real turf.

We respectfully urge the Committee to adopt a moratorium on new and replacement artificial turf fields.

Thank you for your consideration.

Sincerely,

The Reutimann Family
Pasadena 91103



Artificial turf

From Laura Solomon >
Date Tue 3/24/2026 12:42 PM
To Gao, Beilei <bgao@cityofpasadena.net>

You don't often get email from

[Learn why this is important](#)

[A] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you *know* the content is safe. Report phish using the Phish Alert Button. For more information about the Phish Alert Button view article "KB0011474" on the DoIT portal.

To the Municipal Services Committee:

My name is Laura Solomon, and I am a resident of Pasadena and a former chair of the Environmental Advisory Commission. It has come to my attention that the City of Pasadena is considering replacing artificial turf with more artificial turf. Frankly, I am shocked that the City would even consider this, because the environmental problems with artificial turf are well known. Surely we can do better.

I urge the city to replace artificial turf with grass or native plants, depending on the use and situation.

Artificial turf is plastic, which degrades and then harms anyone who has regular contact with it, like children playing soccer. It causes horrific damage to the environment. I could write a book on the harm that degraded plastic is doing to our planet.

Artificial turf gets hot, which is the last thing we need here in Pasadena, where we just broke multiple records with our recent heatwave. How much water will the City have to use to cool down this plastic grass? The amount will only rise as our climate gets hotter and drier.

Artificial turf cannot be recycled. Does the City really want to be responsible for adding tons of decaying plastic to our landfills?

And plastic is made from oil. The current war with Iran shows us how important it is for us to move away from petroleum-based products as much as we can.

Conversely, grass and plants provide multiple benefits. They create a cooling effect. They provide oxygen. When they die, they can be composted and returned to the soil. They provide habitat for all kinds of animals, including birds and insects.

Please do what's best for all of our residents, including children, trees, birds, and other wildlife. Replace artificial turf with native plants and/or grass. Can we really call ourselves a Green City if the "green" is made of plastic?

Thank you for your time.

Laura Solomon

Pasadena, CA 91106

Get [Outlook for iOS](#)



Outlook

MSC Comment - Item #2 - Please Support a Municipal Moratorium on Plastic Fields

From D Woelke

Date Tue 3/24/2026 12:47 PM

To Gao, Bellei <bgao@cityofpasadena.net>

Cc Hampton, Tyron <thampton@cityofpasadena.net>; Cole, Rick <rcole@cityofpasadena.net>; Jones, Justin <jjones@cityofpasadena.net>; Lyon, Jason <jlyon@cityofpasadena.net>

You don't often get email from

[Learn why this is important](#)

[A] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you *know* the content is safe. Report phish using the Phish Alert Button. For more information about the Phish Alert Button view article "KB0011474" on the DoIT portal.



24 March 2026

OPPOSE ITEM #2

Dear Members of the Pasadena Municipal Services Committee,

Thank you for the opportunity to submit these comments on behalf of Safe Healthy Playing Fields, Inc. (SHPFI).

SHPFI is an all-volunteer 501-c-3 non-profit organization. We are committed to educating communities, policymakers and elected officials about the health, safety, and financial realities of plastic fields versus grass fields, and other synthetic surfaces, for their parks and schools. Our constituency ranges from concerned individuals to community and civic organizations, legal, healthcare and science professionals, municipal leaders, and state legislators.

We strongly urge you to place a moratorium on the use of artificial turf fields in Pasadena parks and city facilities.

These "fake fields" routinely reach temperatures of 140–180°F on hot days and have been know to reach well in excess of 200°F conditions that are becoming more common – posing serious risks of burns, heat exhaustion, and heat stroke, and even death, especially for children and athletes. In contrast, natural grass remains significantly cooler. There have been 2 instances of death from heat stroke playing on plastic fields in CA recently- a 12 year old playing at 8:30p on a 88 °F day in

February, another in November 2025 in Los Angeles. This is no longer a risk from Aug through October. Black and brown athletes are drying more frequently on plastic playing fields.

Adolescent lives matter. They have been exposed the longest and most frequently to these toxic products via inhalation, ingestion and inhalation. Already dressed from head to toe in plastic clothing, pads, helmets, leggings, shoes and socks, they become readily overheated, increasing the absorption of toxic and cancer causing chemicals. Just as younger children, adolescents have developmental winds, which extend into early adulthood.

Artificial turf also sheds microplastics and can expose users to harmful chemicals from crumb rubber infill, and from the toxic and cancer causing chemicals that leach from the plastic carpet blades, backing and shockpads. These materials then enter our stormwater system and waterways, contributing to long-term public health and environmental concerns. Each regulation sized field sheds 2 to 3 thousand pounds of plastic blades per year (CA DTSC). The Robinson field is supersized, not regulation sized. Newer so called non-infill synthetic turf has 16x more blades and sheds even more!

The city's 2 fields are in EJ/SJ communities, imposing yet greater risk to vulnerable populations, adding the burden of heat island effects, toxic exposures, and, in the case of Robinson Park, increasing inequity by locking off the overheated toxic field, excluding those who cannot afford to "pay to play."

Unlike living grass, synthetic fields provide no environmental benefits. They do not cool the air, support biodiversity, or absorb stormwater, and may worsen flooding. They also create significant waste, as fields must be replaced every 8–10 years, often sooner, and are not recyclable- despite industry claims that are being recited by staff members of Parks and Rec.

Natural grass fields are the safer, cooler, produce oxygen, enhance rather than decimate biodiversity, do not contribute to the massive amount of plastic pollution, and provide more a future-proof choice for all who live in and visit Pasadena.

Respectfully submitted,

Dianne Woelke MSN, Board Member
Safe Healthy Playing Fields, Inc.
<https://www.safehealthyplayingfields.org>
SHPFI is an all-volunteer nonprofit 501-c-3





Outlook

Agenda item #2

From Cynthia Cannady

Date Tue 3/24/2026 12:52 PM

To Gao, Beilei <bgao@cityofpasadena.net>

[A] **CAUTION:** This email was delivered from the Internet. Do not click links or open attachments unless you *know* the content is safe. Report phish using the Phish Alert Button. For more information about the Phish Alert Button view article "KB0011474" on the DoIT portal.

Dear MSC,

I join the calls for a moratorium on installation and replacement of artificial turf (AF) fields in our city. There are so many reasons to ban AF fields that it's hard to know where to start.

I will focus on three compelling reasons for a ban.

First, the risk of harm to children playing on the fields is serious. There are multiple reports from credible scientific sources identifying and analysing the risks to all persons, but especially to vulnerable children. Most recently California's Dept of Toxic Substances Control published a [technical report on AF](#). The report is disturbing. In summary, it finds:

"The use of artificial turf raises concerns due to its potential to expose humans and the environment to PFASs. People who use (e.g., play on) artificial turf can be directly exposed to PFASs through inhalation, ingestion, and dermal absorption. Young children and other sensitive subpopulations are especially vulnerable to the effects of this class of chemicals, some of which are developmental toxicants. In addition to its potential to expose users to PFASs, artificial turf can also release PFASs to the environment. As artificial turf weathers, it can leach PFASs into water. Once released to the environment during product manufacture, use, or disposal, PFASs become part of a virtually closed cycle leading to chronic human and ecological exposures. PFASs are found in aquatic, atmospheric, and terrestrial environments, including remote locations far from any point source. They are present in indoor dust, drinking water sources, food, wildlife, and humans—including the milk and serum of breastfeeding women. Because persistent PFASs lack a natural degradation route, their levels in the environment, humans, or biota will continue to rise for as long as PFASs are produced and used in consumer products. In California, most end-of-life artificial turf is disposed of in landfills, which can release PFASs to the environment in leachates and gaseous emissions. Wastewater treatment plants (WWTPs) that collect landfill leachates, surface runoff, and residential and commercial wastewater do not effectively remove PFASs. PFASs in influent partition either to effluent water or sludge."

The Pasadena Public Health Dept cites a recent Cal EPA study that **admits that AF contains toxic compounds**, but discounts the *bioavailability of toxic fumes and particulate matter*, and laments "small exceedences." The public health department acknowledges that "more studies would be helpful" and careful study is warranted to assess long term impact. Cancer? Asthma?

On our children? No.

AF may contain cadmium, benzene, Polycyclic Aromatic Hydrocarbons (PAHs), phthalates, styrene, Volatile Organic Compounds (VOCs) and per- and polyfluoroalkyl substances (PFAS) are found in the plastic blades, backing, underlayment pads and in some plant based infills added to keep the blades upright.

Children are vulnerable. cadmium, benzene, Polycyclic Aromatic Hydrocarbons (PAHs), phthalates, styrene, Volatile Organic Compounds (VOCs) and per- and polyfluoroalkyl substances (PFAS) are found in the plastic blades, backing, underlayment pads and in some plant based infills added to keep the blades upright. Endocrine disrupters in plastics can have grave impacts on sexual development and are implicated in breast and other cancers.

Why would we take a vendor's word that is monitoring manufacture to reduce PFAS? It is actually absurd that Parks and Recreation is recommending AF installation without specifics and representations about the AF content and manufacture.

And **who decides** whether children should be exposed to "low risk" of asthma and cancer? What efforts have been made to inform parents of what is in this AF and this supposed "low risk" so that they can make the difficult decision to pull their children out of highly desirable sports programs?

In a city where black and brown children and adults have aggravated levels of asthma and respiratory diseases, which the Public Health Dept has declined to study, the notion that exposure to environmental toxins and PFAS is low risk is worrisome.

What is a low risk? Apparently, it is too great for parents at Polytechnic School and for parents in San Marino. But OK for Villa Park and Jackie Robinson.

Second, it is undisputed that artificial turf is hot, and exposes children to heat related injuries and creates a heat island effect. The last thing we need in **heat-threatened Pasadena**, especially in central and NW Pasadena, is more heat.

As one of the world experts on AF, Dr. Sarah Evans from Mt. Sinai Hospital in New York, has explained "it gets really hot." Dr. Evans has been sued by the AF industry for publishing factual scientific information about AF.

Indeed the politics of AF is worrisome. The Cal EPA report cited by the Pasadena Public Health Dept was produced over objection from scientific panelists, as this [LA Times Article](#) explains.

Third, it is undisputed that artificial turf and its constituent chemicals are made from petroleum products and that its manufacture, installation use and disposal creates greenhouse gas emissions.

Why would we go to the trouble of implementing the Climate Emergency Resolution 9977 to reduce our city's greenhouse gas emissions but then spend a million dollars on AF products that emit greenhouse gasses?

And the amount of GHGs from AF is appreciable. AF is made from petroleum-based materials like polyethylene, polypropylene, or nylon. The production of synthetic fibers and backing requires high-

temperature manufacturing, emitting substantial carbon dioxide. When it's use is complete, it goes into landfill where it creates more GHGs.

I urge you to reject the Parks and Recs demand for AF installation.

Cynthia Cannady



Outlook

MSC Comment - Item #2 - Please Support a Municipal Moratorium on Plastic Fields

From Petrea Burchard

Date Tue 3/24/2026 1:04 PM

To Gao, Beilei <bgao@cityofpasadena.net>

Cc Hampton, Tyron <thampton@cityofpasadena.net>; Cole, Rick <rcole@cityofpasadena.net>; Jones, Justin <jjones@cityofpasadena.net>; Lyon, Jason <jlyon@cityofpasadena.net>

You don't often get email from

[Learn why this is important](#)

[A] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you **know** the content is safe. Report phish using the Phish Alert Button. For more information about the Phish Alert Button view article "KB0011474" on the DoIT portal.

Dear Members of the Pasadena Municipal Services Committee,

I urge you to place a moratorium on the use of artificial turf fields in Pasadena parks and city facilities.

Please! Have you ever walked on artificial turf on a summer day? Better have some thick boots on. They get so hot they will literally burn your feet. I know, because I stepped on one once, in sandals. Bad idea.

These "fake fields" routinely reach temperatures of 140–180°F on hot days – conditions that are becoming more common – posing serious risks of burns, heat exhaustion, and heat stroke, especially for children and athletes. In contrast, natural grass remains significantly cooler.

Artificial turf also sheds microplastics and can expose users to harmful chemicals from crumb rubber infill, including heavy metals and other toxic compounds. These materials then enter our stormwater system, environment, and waterways, contributing to long-term public health concerns.

Unlike living grass, synthetic fields provide no environmental benefits. They do not cool the air, support biodiversity, or absorb stormwater, and may worsen flooding. They also create significant waste, as fields must be replaced every 8–10 years and are not recyclable.

Natural grass fields are the safer, cooler, and more future-proof choice for our community.

Sincerely,



Outlook

MSC Comment - Item #2 - Please Support a Municipal Moratorium on Plastic Fields

From Levi Brewster**Date** Tue 3/24/2026 1:12 PM**To** Gao, Bellei <bgao@cityofpasadena.net>**Cc** Hampton, Tyron <thampton@cityofpasadena.net>; Cole, Rick <rcole@cityofpasadena.net>; Jones, Justin <jjones@cityofpasadena.net>; Lyon, Jason <jlyon@cityofpasadena.net>

You don't often get email from

[. Learn why this is important](#)

[A] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you **know** the content is safe. Report phish using the Phish Alert Button. For more information about the Phish Alert Button view article "KB0011474" on the DoIT portal.

Dear Members of the Pasadena Municipal Services Committee,

I urge you to place a moratorium on the use of artificial turf fields in Pasadena parks and city facilities. These "fake fields" routinely reach temperatures of 140–180°F on hot days – conditions that are becoming more common – posing serious risks of burns, heat exhaustion, and heat stroke, especially for children and athletes. In contrast, natural grass remains significantly cooler. Artificial turf also sheds microplastics and can expose users to harmful chemicals from crumb rubber infill, including heavy metals and other toxic compounds. These materials then enter our stormwater system, environment, and waterways, contributing to long-term public health concerns. Unlike living grass, synthetic fields provide no environmental benefits. They do not cool the air, support biodiversity, or absorb stormwater, and may worsen flooding. They also create significant waste, as fields must be replaced every 8–10 years and are not recyclable. Natural grass fields are the safer, cooler, and more future-proof choice for our community.

Sincerely,

Levi Brewster



Outlook

MSC Comment - Item #2 - Please Support a Municipal Moratorium on Plastic Fields

From Greg Apodaca

Date Tue 3/24/2026 2:39 PM

To Gao, Beilei <bgao@cityofpasadena.net>

Cc Hampton, Tyron <thampton@cityofpasadena.net>; Cole, Rick <rcole@cityofpasadena.net>; Jones, Justin <jjones@cityofpasadena.net>; Lyon, Jason <jlyon@cityofpasadena.net>

You don't often get email from

[Learn why this is important](#)

[A] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you *know* the content is safe. Report phish using the Phish Alert Button. For more information about the Phish Alert Button view article "KB0011474" on the DoIT portal.

Dear Members of the Pasadena Municipal Services Committee,

I urge you to place a moratorium on the use of artificial turf fields in Pasadena parks and city facilities.

These "fake fields" routinely reach temperatures of 140–180°F on hot days – conditions that are becoming more common – posing serious risks of burns, heat exhaustion, and heat stroke, especially for children and athletes. In contrast, natural grass remains significantly cooler.

Artificial turf also sheds microplastics and can expose users to harmful chemicals from crumb rubber infill, including heavy metals and other toxic compounds. These materials then enter our stormwater system, environment, and waterways, contributing to long-term public health concerns.

Unlike living grass, synthetic fields provide no environmental benefits. They do not cool the air, support biodiversity, or absorb stormwater, and may worsen flooding. They also create significant waste, as fields must be replaced every 8–10 years and are not recyclable.

Natural grass fields are the safer, cooler, and more future-proof choice for our community.

Sincerely,

Greg Apodaca
Chief Explorer
Community 3.0x



Outlook

MSC Comment - Item #2 - Please Support a Municipal Moratorium on Plastic Fields

From Pilar Reynaldo >

Date Tue 3/24/2026 2:54 PM

To Gao, Bellei <bgao@cityofpasadena.net>

Cc Hampton, Tyron <thampton@cityofpasadena.net>; Cole, Rick <rcole@cityofpasadena.net>; Jones, Justin <jjones@cityofpasadena.net>; Lyon, Jason <jlyon@cityofpasadena.net>

[You don't often get email from . Learn why this is important at
<https://aka.ms/LearnAboutSenderIdentification>]

[△] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you know the content is safe. Report phish using the Phish Alert Button. For more information about the Phish Alert Button view article "KB0011474" on the DoIT portal.

Dear Members of the Pasadena Municipal Services Committee,

I urge you to place a moratorium on the use of artificial turf fields in Pasadena parks and city facilities.

These "fake fields" routinely reach temperatures of 140–180°F on hot days – conditions that are becoming more common – posing serious risks of burns, heat exhaustion, and heat stroke, especially for children and athletes. In contrast, natural grass remains significantly cooler.

Artificial turf also sheds microplastics and can expose users to harmful chemicals from crumb rubber infill, including heavy metals and other toxic compounds. These materials then enter our stormwater system, environment, and waterways, contributing to long-term public health concerns.

Unlike living grass, synthetic fields provide no environmental benefits. They do not cool the air, support biodiversity, or absorb stormwater, and may worsen flooding. They also create significant waste, as fields must be replaced every 8–10 years and are not recyclable.

Natural grass fields are the safer, cooler, and more future-proof choice for our community.

Sincerely,

Pilar Reynaldo



Outlook

MSC Comment - Item #2 - Please Support a Municipal Moratorium on Plastic Fields

From Terry Saucier

Date Tue 3/24/2026 3:02 PM

To Gao, Beilei <bgao@cityofpasadena.net>

Cc Hampton, Tyron <thampton@cityofpasadena.net>; Cole, Rick <rcole@cityofpasadena.net>; Jones, Justin <jjones@cityofpasadena.net>; Lyon, Jason <jlyon@cityofpasadena.net>

You don't often get email from

[Learn why this is important](#)

[A] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you *know* the content is safe. Report phish using the Phish Alert Button. For more information about the Phish Alert Button view article "KB0011474" on the DoIT portal.

Dear Members of the Pasadena Municipal Services Committee,

I am a member of a 60+ coalition that is seeking a ban on new and replacement installations of artificial turf across all applications due to its negative impacts on human health, the environment and wildlife. I urge you to place a moratorium on the use of artificial turf fields in Pasadena parks and city facilities and prioritize nature-based solutions – California native plants and drought-tolerant grasses that use less water, are more cost effective, can meet playable hours needed, thrive in our climate, recharge our groundwater, and provide food and habitat for local wildlife.

Sincerely,

Terry Saucier

SoCal Stop Artificial Turf Task Force, Chair

[Coalition Artificial Turf Letter](#) - please share

re: Agenda Item 1 on Municipal Services Committee meeting on June 23, 2026

From Myung-Soo Seok

Date Mon 6/22/2026 5:50 PM

To cityclerk <cityclerk@cityofpasadena.net>; Bernard, Nicole (Dist1) <nibernard@cityofpasadena.net>; DerBoghossian, Megheti <mderboghossian@cityofpasadena.net>; Barrios, Lisa <lisabarrios@cityofpasadena.net>; Thyret, Pam <pthyret@cityofpasadena.net>

Cc Robert Smith <[REDACTED]>; Tony Trinidad <[REDACTED]>; Stephanie Von Slomski <[REDACTED]>; Vince Ramos <[REDACTED]>; Matt W <[REDACTED]>; Peter Escalera <[REDACTED]>

 6 attachments (6 MB)

City of Pasadena opposition letter final draft.docx; TCG Flyer_DC36_ClientReview.pdf; Turf Temperature_TenCate 0525.pdf; 2026 natural grass synthetic cost comparison.pdf; PFAS Fact Sheet_Final (1).pdf; TenCate PFAS Statement_1.9.24 (1).pdf;

Some people who received this message don't often get email from

[Learn why this is important](#)

[A] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you *know* the content is safe. Report phish using the Phish Alert Button (PAB). For more information about the PAB view article "KB0011474" on the DoIT portal.

On behalf of the Painters and Allied Trades District Council 36, we would like to resubmit our previous letter and several supporting documents for our argument for supporting synthetic turf of support for synthetic turf replacement at Villa Parke and Robinson Park.

As we have stated at City Council meeting previously, current arguments against synthetic turf are based on much dated facts and technology. There are cutting edge sustainability technology that are in use in dealing with PFAS, heat mitigation and recycling. There are synthetic turf products that do not use PFAS in its manufacturing process. In addition, when comparing cost and usable hours of natural versus synthetic turf, you will clearly see that synthetic turf products allow the children and student athletes to have more hours of use.

In closing, we heard that there may be a possibility for the City of Pasadena to consider a citywide ban of synthetic turf. We strongly oppose this as a union that represents the professional installers of synthetic turf. We would consider this type of ban to be a job killer for our members that is not warranted.

We look forward to continuing this conversation during the MSC meeting on June 23, 2026.

If you have any questions, please do not hesitate to contact us.

Best,

Myung-Soo Seok, on behalf of Painters and Allied Trades District Council 36
M2 Strategies



Painters & Allied Trades District Council 36

Luis F. Robles

Business Manager

DRYWALL FINISHERS, FLOORLAYERS, GLAZIERS, PAINTERS, TRADESHOW & SIGNCRAFT

June 4, 2025

Mayor Victor Gordo
City Councilmember Tyron Hampton
Councilmember Rick Cole
Councilmember Justin Jones
Councilmember Gene Masuda
Councilmember Jason Lyon

Re: Proposed Ban on Artificial Turf in City of Pasadena

Dear Mayor Gordo and Councilmembers:

Thank you for the opportunity to comment on the discussion of ban of synthetic turf in Pasadena. We are a labor union that represents workers that install synthetic turf throughout California. While we appreciate the genuine concerns that the members of the City Council have, an outright ban of synthetic turf is both irresponsible and unnecessary in alleviating environmental concerns. In particular, there seems to be an assumption that all artificial turf manufactured with same materials and that is not the case. Case in point is the artificial grass manufactured by TenCate.

TenCate is the leading manufacturer of artificial turf in the world. Their artificial turf has proactively eliminated PFAS materials in 2023 before any PFAS legislation has been passed. This eliminates widespread concern of PFAS impact on the environment.

In order to address the concern of harmful chemicals leeching into the ground water, TenCate eliminated rubber infill with GeoCool infill which is made from a renewable inorganic mineral that is 100% renewable and non-toxic. Other organic and natural infills made with cork or walnut shells have been incorporated.

In addressing temperature of the artificial grass, TenCate has incorporated non-toxic and natural materials that cool down the artificial grass that does not use water. This leads to millions of gallons of water being conserved each year. These materials allow the current models of synthetic turf to reduce temperature on the field. You can see from the study that we are enclosing with this letter, you will see that the difference between natural grass and current synthetic turf is not great.

Finally, TenCate is actively recycling end of life artificial turf. TenCate is the first in United States to recycle old synthetic turn into feedstock that can be used to create new turf and other products.

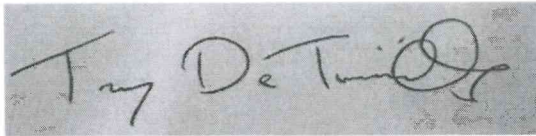
While we commend the Councilmembers for initiating this important discussion about the impact of synthetic grass on the environment, an outright ban will lead to loss of small businesses and jobs that were encouraged to be created during our drought crisis. Our union will lose thousands of jobs throughout California if such ban is passed throughout the state.

Rather than banning an entire industry, implementation of thoughtful regulation of eliminating harmful materials and creating an industry standard should be considered. In fact, such discussions are taking place in many municipalities in State of CA, including in the City of Los Angeles.

We look forward to speaking with you as you prepare to hear this issue in your future City Council meeting.

I can be reached at

Thank you.

A handwritten signature in black ink on a light-colored background. The signature reads "Tony De Trinidad" in a cursive, stylized script. The "T" is large and loops around the "y". The "De" is written in a smaller, more compact cursive. The "Trinidad" is written in a larger, more flowing cursive, ending with a large, decorative flourish.

Tony De Trinidad
Government Affairs Representative
International Union of Painters & Allied Trades District Council 36



REGULATE TURF. DON'T BAN IT.

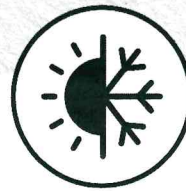
PROTECT JOBS, PLAY, AND COMMUNITY ACCESS



1000s
of jobs



2000+
hours of play annually



365/24/7
play in all climates



\$52.2 billion
sports tourism industry

SYNTHETIC TURF PROVIDES CRITICAL ACCESS TO PLAY WHERE WATER AND SPACE ARE LIMITED.

- Supports thousands of jobs
- Offers 2000+ hours of play annually versus 800-1200 from natural grass¹
- Directly contributes to a \$52.2 billion sports tourism industry²



A natural grass field is more resource-heavy than turf: it needs up to 2 inches of water a week³, (that's ~1,000,000 gallons per year) and 87–217 pounds of nitrogen fertilizer per 1,000 square feet per year.⁴

REGULATIONS CAN KEEP CONCERNS AT BAY AND TURF IN PLAY

Let's work towards better turf — recyclable, PFAS-free, with no infill — and keep jobs and play in our communities.

PROBLEM	REALITY	SOLUTION
Rubber infill	Alternatives to rubber infill exist, like coconut or cork, and some top performing fields don't require infill ⁵ at all.	Incentivize alternative and no-infill systems in new installs.
PFAS exposure	This OEHHA study ⁶ found no significant health risks from exposure to synthetic turf. PFAS are also found in natural grass fields due to fertilizers and pesticides.	Prohibit added PFAS in synthetic turf and natural fields.
Plastic waste	Turf is not single use like plastic packaging; it can offer years of community benefits. Recycling technologies are advancing but require policy support.	Require systems to be designed for recycling and mandate end-of-life recycling plans.
Microplastics	Fiber loss varies by system type, maintenance, and age. Emerging data shows lower shedding in infill-free systems.	Establish monitoring standards, maintenance requirements, and clear replacement thresholds.

¹ <https://www.paloalto.gov/files/assets/public/v/1/community-services/2025-08-13-reduced-size-for-posting-palo-alto-turf-athletic-fields-draft.pdf>

² <https://www.sportstravelmagazine.com/report-sports-related-travel-generated-52-2-billion-impact-in-2023>

³ <https://safesportsfields.cals.cornell.edu/routine-care/watering/>

⁴ <https://mda.maryland.gov/siteassets/pages/fertilizer/tt119.pdf>

⁵ <https://geosurfaces.com/pivot-by-tencate/>

⁶ <https://oehha.ca.gov/sites/default/files/media/2025-03/DraftTurfReport031325.pdf>

Heat and Temperature Impacts of Synthetic Turf

Prepared for New York City
Department of Parks & Recreation

by Dr. Colin Young, PhD | TenCate Grass

Table of Contents

• Introduction	3
• Thermal Characteristics of Turf	4
• Cooling Technologies and Modern Innovations	5
• Heat Stress (not only Surface Temperatures)	6
• Urban Heat Island (UHI)	7
• Policy Implications and Future Research	8
• Conclusion	9
• References	10
• Appendix	11

Heat and Temperature Impacts of Synthetic Turf

Introduction

Synthetic turf fields have become a popular solution for recreational, educational, and sports facilities due to their ability to provide consistent play surfaces and significantly higher availability than natural grass. Unlike grass fields, which are often closed due to drought, rain, poor drainage, or recovery time, turf fields can withstand intensive use. A growing body of research from municipal parks departments and public agencies supports the operational and economic benefits of synthetic turf:

A study from the National Recreation and Park Association (NRPA) and field audits by San Francisco Recreation and Parks Department (SFRPD) report synthetic fields offer 2,000–3,000 hours of annual availability, compared to 300–816 hours for natural grass, depending on maintenance schedules and regional climate.

City of New York Parks & Recreation reported that synthetic fields provided 5 to 8 times more usable hours per year and enabled year-round programming.

These benefits are particularly valuable in hot, arid, or drought-affected regions where natural grass cannot survive without excessive irrigation. However, the expansion of turf has raised important questions about thermal performance, especially in hot climates. This document examines the thermal characteristics of synthetic turf, its contributions to heat stress and the urban heat island effect and compares traditional turf systems with modern cooling solutions using peer-reviewed studies, municipal research, and laboratory testing data.

Unlike natural grass, which maintains a relatively stable and cool surface temperature through evapotranspiration, traditional synthetic turf lacks organic moisture regulation mechanisms. As a result, legacy turf surfaces can reach extreme temperatures during sunny weather, often exceeding the ambient air temperature by more than 30°C (86°F).

Studies have recorded surface temperatures on traditional synthetic turf as high as 62.5°C (144.5°F), whereas adjacent natural grass remained under 37°C (98.6°F). In sunny climates such as Arizona, Texas, and Southern California, synthetic turf fields have been recorded at temperatures above 70°C (158°F), making them hazardous for direct human contact.

While some older synthetic turf systems, particularly those using dense, black SBR rubber infill, have been shown to reach high surface temperatures, it is important to recognize that not all turf systems are the same. Advances in materials science and system engineering have produced a new generation of synthetic turf fields that perform far better in terms of thermal regulation. Modern systems utilize cooling infills made from GeoCool, cork, mineral blends; or innovative system design such as non-performance infill turf like Pivot™ or water storage under the field. These features significantly reduce surface temperatures and, more importantly, lower Wet Bulb Globe Temperature (WBGT) readings, bringing heat stress risk levels close to those observed on natural grass fields under the same environmental conditions.

This distinction is essential for public health and policy. Evaluating synthetic turf as a monolithic category can lead to misleading conclusions about heat safety. In reality, a well-designed, modern synthetic turf system can offer both the durability and high usage benefits of turf and the thermal safety characteristics associated with natural grass. As municipalities, schools, and sports organizations consider future installations, they should demand thermal performance data, especially WBGT assessments, and prioritize systems that actively manage surface heat. With the right design choices, synthetic turf can be both safe and sustainable, even in hot climates.

Thermal Characteristics of Turf

The primary cause of heat build-up in synthetic turf systems is solar radiation. Unlike natural grass, which uses moisture and evapotranspiration to cool its surface, synthetic turf lacks any biological mechanisms for heat dissipation. Instead, it absorbs solar energy through its plastic fibers, rubber or polymeric infill, and underlying base layers. This absorbed energy is stored in the materials and gradually re-radiated as heat, causing surface temperatures to rise, especially under direct sunlight.

Material choice plays a pivotal role in the thermal behavior of turf. Polyethylene, the most common yarn material used in turf fibers, has low thermal conductivity and high heat retention, meaning it traps heat rather than disperses it. Traditional SBR (styrene-butadiene rubber) infill is particularly problematic due to its dark color and low reflectivity, which makes it highly efficient at absorbing infrared energy. Moreover, SBR has low emissivity and thermal diffusivity, which means it stores heat and releases it slowly, even after the sun has gone down. This creates a thermal lag effect, where the surface remains dangerously hot well into the evening.

Other design elements also influence heat accumulation. Turf density, pile height, and infill depth can increase the surface area exposed to sunlight, further intensifying heat absorption. Underneath, impermeable or compacted base layers inhibit airflow, reducing opportunities for convective cooling. In contrast, modern systems that include breathable pads, reflective pigments, and lighter infills (such as cork or mineral-based alternatives) offer significant improvements in both surface temperature and subsurface heat dynamics.

Understanding these thermal dynamics is critical when evaluating the health and safety implications of synthetic turf installations. It also highlights why legacy systems with high-heat materials must not be conflated with today's engineered solutions, which are increasingly designed with thermal performance and heat stress mitigation in mind. Below are some examples of recent innovations to mitigate the heat of turf.

Cooling Technologies and Modern Innovations

To address the longstanding concern of excessive heat buildup on synthetic turf, manufacturers have developed a variety of innovations aimed at significantly lowering surface temperatures and improving heat stress performance. One of the most effective areas of advancement has been the development of alternative infill materials. Traditional black SBR rubber infill is known for its high heat retention, but modern infills, such as cork, coconut husk, wood fiber, and mineral-based blends, have much lower thermal mass and higher emissivity. These properties allow them to absorb less heat during the day and release it more efficiently, resulting in a measurable reduction in both surface temperature and underlying heat stress.

Among these, GeoCool® infill has shown particularly promising results. Designed from natural mineral compounds, GeoCool is engineered to remain cooler than traditional infills by resisting heat absorption and facilitating evaporative cooling when moisture is present. Field testing has demonstrated that turf systems using GeoCool can achieve surface temperatures up to 30–40°F (17–22°C) cooler than comparable fields with SBR infill. When paired with breathable underlayers and high-albedo turf fibers, these systems show WBGT levels close to those recorded on natural grass fields, even in warm climates.

In addition to infill innovation, yarn technology has advanced significantly. Use of pigments and materials with higher solar reflectance (albedo), reducing the amount of solar radiation converted into heat. Yarn shape also plays a role, textured or ribbed fibers can reduce the surface area directly exposed to the sun and improve airflow between the blades, helping to disperse heat more effectively.

A parallel trend in the industry is the rise of non-infill systems, which eliminate the need for loose particles altogether such as Pivot™. This system often relies on dense, structured turf piles combined with integrated padding layers for shock absorption and play performance. By removing the infill, particularly heat-retaining rubber, these systems avoid one of the primary drivers of extreme surface temperatures. Non-infill turf systems are increasingly paired with evaporative base layers or capillary irrigation systems, particularly in European cities focused on sustainability and climate resilience.

Together, these innovations represent a significant leap forward in managing the thermal behavior of synthetic turf. When properly selected and designed, these systems provide a surface that remains far cooler than legacy rubber-filled fields, making them more comfortable and safer for athletes, children, and the broader public. These are not concepts but have been used successfully for several years all around the USA.

Other interesting innovations in urban research from the Netherlands (KWR Water Research Institute and City of Amsterdam) showed that new cooling turf systems can significantly reduce this, bringing peak surface temperatures close to natural grass levels by integrating subsurface water storage and evaporative cooling. Subsurface Capillary Irrigation Systems: Pioneered in Amsterdam, these systems store water beneath the field and use passive evaporation to reduce surface temperature significantly.

Heat Stress (not only Surface Temperatures)

Understanding heat stress requires more than just measuring how hot a surface gets. While peak surface temperatures on synthetic turf can be very high, especially on older systems with rubber infill, heat stress itself is a more complex condition influenced by multiple environmental factors, including temperature, humidity, wind speed, and solar radiation. In the United States, the most widely accepted and scientifically validated tool for assessing heat stress in sports and outdoor environments is the Wet Bulb Globe Temperature (WBGT) index.

The WBGT is not the same as the regular air temperature. Instead, it combines measurements of ambient temperature, humidity, radiant heat (from sunlight), and wind speed into a single number that reflects the actual thermal stress on the human body. High humidity, for example, limits the body's ability to cool itself through sweating, which makes even moderate temperatures more dangerous. WBGT helps coaches, athletic trainers, schools, and parks departments make informed decisions about when it's safe to be active outdoors, regardless of whether the field is made of turf or natural grass.

National organizations like the National Athletic Trainers' Association (NATA) and the American Academy of Pediatrics (AAP) recommend using WBGT thresholds to guide sports practice, games, and outdoor activities, especially for children and adolescents who are more vulnerable to heat-related illnesses. Many states, including Georgia and Texas, have adopted mandatory WBGT monitoring protocols for high school sports, requiring activity modifications, hydration breaks, or cancellations when WBGT levels reach high or extreme zones.

In simple terms, WBGT offers a real-world snapshot of heat risk, not just a number on a thermometer. It considers how hard the body has to work to cool itself, based on actual environmental conditions. This is why modern turf systems should not be judged solely on peak surface temperature. Instead, systems should be evaluated on how they affect overall heat stress, including WBGT outcomes during peak-use times. Fortunately, as covered above, many of today's advanced turf systems using alternative infills, lighter yarns, and cooling designs now show WBGT values that closely match or even improve upon natural grass fields.

Urban heat island (UHI)

The urban heat island (UHI) effect describes how urban environments become significantly warmer than surrounding rural areas due to the widespread use of heat-absorbing surfaces like asphalt, concrete, and dark roofing materials. Traditional synthetic turf systems, especially those that use black SBR rubber infill, can contribute to this problem by absorbing and re-radiating large amounts of solar energy, leading to elevated surface and ambient temperatures in their immediate vicinity.

However, it is important to recognize that not all turf contributes equally to the heat island effect. Modern synthetic turf systems have been specifically engineered to reduce their thermal impact. By replacing rubber infill with light-colored, low-heat materials such as cork, wood blends, or mineral-based alternatives, and by using reflective yarns and breathable base layers, these systems significantly lower surface temperatures. Some newer designs also incorporate subsurface irrigation or passive cooling layers that mimic the cooling function of natural grass through evaporation, further reducing their contribution to localized heating.

Field research has shown that well-designed cooling turf systems can perform comparably to, or even better than, other urban surfaces like sand-filled tennis courts or light-colored concrete in terms of thermal load. Importantly, while legacy rubber-based fields may amplify the UHI effect, modern turf can act as a neutral or even mitigating surface when part of a thoughtfully designed urban landscape.

When evaluating the environmental impact of synthetic turf, it's essential to distinguish between outdated systems that elevate urban heat and innovative systems that are actively engineered to counteract it. With the right materials and design features, synthetic turf can be a sustainable, heat-conscious solution for urban recreation areas.

Did you know:

While it's true that turf is often warmer than natural grass, its surface temperature is generally lower than many other urban surfaces, such as asphalt, hard tennis courts, and various types of playgrounds and equipment.

Surface Temperature	Turf (Rubber)	Turf (Pivot)	Road (asphalt)	Painted Tennis Court (Green)	Safety Surface Childs Playground (Blue)	Playground Slide (Metal)
Min	85	87	88	89	88	85
Mean	114	108	121	118	119	122
Max	135	121	142	139	133	145

Note: temperatures measured on a range of surface types on the same day all locations within 10 miles

Policy Implications and Future Research

The widespread use of turf in public settings necessitates clearer national-level guidelines for heat exposure. While voluntary standards and local protocols exist, there is no unified federal approach to synthetic turf heat safety in the United States.

Recommendations include:

1. Mandating WBGT-based monitoring for all turf sports events.
2. Designing turf systems with proven cooling technologies and reduced WBGT heat stress levels.
3. Updating building codes and urban development policies to address UHI impact from large-scale artificial turf installations using WBGT data.
4. Funding continued research into materials science for low-heat polymers and sustainable infill.
5. Balancing usability, water conservation, and heat safety.

Conclusion

The conversation around heat and synthetic turf is often oversimplified, focusing narrowly on surface temperature alone. While surface temperature is important, especially in the case of outdated turf systems that used black rubber infill, it does not provide a complete picture of heat risk. Heat stress is a multifactorial condition, influenced by humidity, wind, solar radiation, and surface properties, all of which are captured in the Wet Bulb Globe Temperature (WBGT) index. This index is already used widely across the United States to guide decisions in youth sports and outdoor activity settings and should be the primary reference tool for evaluating field safety, regardless of surface type.

What is clear from current evidence is that modern turf systems are fundamentally different from legacy products. Advances in infill composition, yarn materials, reflective coatings, and integrated cooling mechanisms mean that today's best-performing synthetic turf fields can match or even outperform natural grass when it comes to thermal safety. WBGT measurements from controlled field tests consistently show that properly engineered turf systems remain within safe zones under the same conditions where older systems exceed critical thresholds.

At the same time, this issue is not binary. The discussion should not be reduced to "turf vs. grass," but rather focused on performance, safety, and climate adaptability. Natural grass offers valuable ecological functions, but it also struggles in areas with water scarcity, high usage demands, or poor soil quality. Synthetic turf, when thoughtfully designed and maintained, can be a safe, sustainable solution, especially when paired with smart design strategies that address cooling and end-of-life impacts.

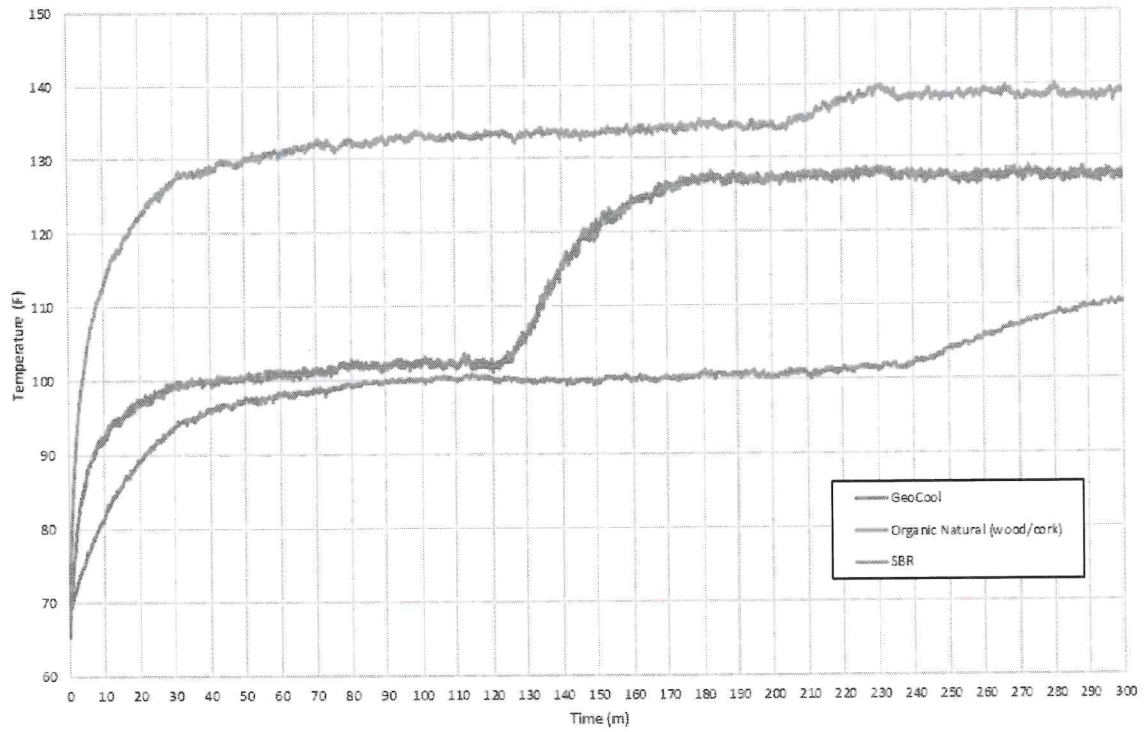
Further research is both necessary and valuable, not to delay progress, but to guide it. Policymakers, urban planners, and sports authorities should invest in comparative WBGT data to ensure decisions are based on science, not assumptions. The goal should not simply be to avoid heat, but to create safe, resilient outdoor spaces that serve people, protect public health, and respond to the realities of a changing climate.

References

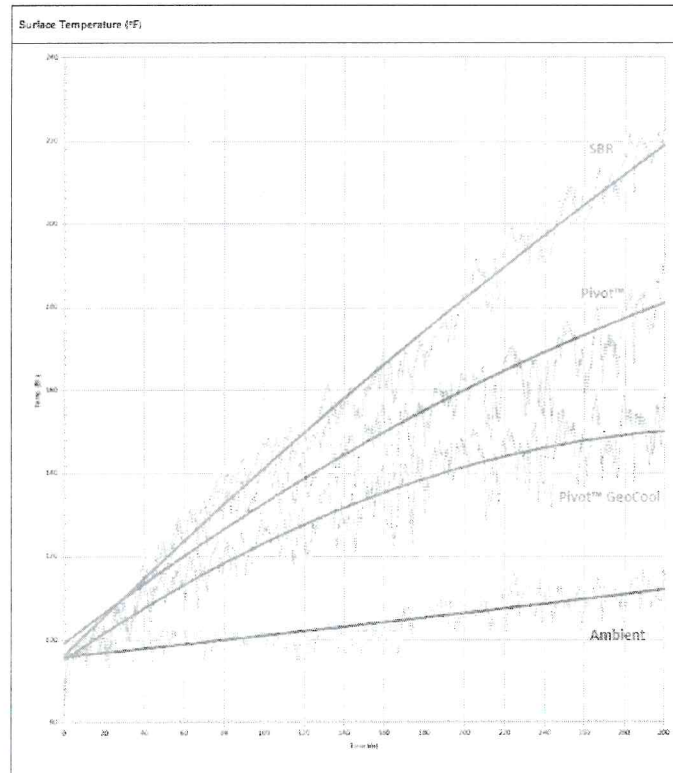
1. Duffie JA, Beckman WA. Solar engineering of thermal processes. 4th ed. Hoboken (NJ): Wiley; 2013.
2. McNitt AS, Petrunak DM. Evaluation of playing surface characteristics of various in-filled systems. University Park (PA): Penn State Center for Sports Surface Research; 2008.
3. Devitt DA, Fenstermaker LF, Young MH. Surface temperature, heat loading and spectral reflectance of artificial turfgrass. *J Turfgrass Sports Surf Sci.* 2007;83:68–81.
4. Grundstein A, Cooper E, Ferrara M, Knox JA. Prevalence of exertional heat stroke related policies for high school football players in the United States. *Kinesiol Rev.* 2015;4(3):209–17.
5. Haselbach L. The engineering guide to LEED—New construction: Sustainable construction for engineers. New York (NY): McGraw Hill; 2010.
6. TenCate Grass. Temperature insights: USA turf research – August 2024. Internal Report. 2024.
7. KWR Water Research Institute; Municipality of Amsterdam. Smart sports field cooling via capillary irrigation: Case study report. Nieuwegein (NL): KWR; 2023.
8. San Francisco Recreation and Parks Department. Synthetic vs. natural turf field analysis. San Francisco (CA): SFRPD; 2012.
9. New York City Department of Parks and Recreation. Synthetic turf usage guidelines. New York (NY): NYC Parks; 2013.
10. Brigham Young University. Surface temperature of synthetic vs. natural turf fields. Provo (UT): BYU; 2006.
11. American Academy of Pediatrics. Climatic heat stress and exercising children and adolescents: Policy statement. *Pediatrics.* 2011;128(3):e741–47.
12. National Athletic Trainers' Association. Exertional heat illnesses position statement. *J Athl Train.* 2015;50(9):986–1000.
13. Oke TR. Boundary layer climates. 2nd ed. London (UK): Routledge; 1987.
14. Cengel YA. Heat and mass transfer: A practical approach. 3rd ed. New York (NY): McGraw Hill; 2007.
15. Kalman P, Anis H. Thermal diffusivity of rubber materials. *Polym Test.* 2019;76:27–34.
16. Berdahl P, Bretz SE. Preliminary survey of the solar reflectance of cool roofing materials. *Energy Build.* 1997;25(2):149–58.

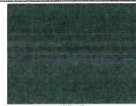
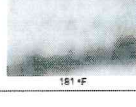
Appendix: Data

GeoCool - surface temperature vs time exposure



Pivot, Pivot with GeoCool, and SBR Comparison - surface temperature vs time exposure



Time (min)	Sample		
	Pivot™	Pivot™ with GeoCool	SBR System
0			
60			
120			
180			
240			
200			

12 YEAR COST COMPARISON		NATURAL GRASS		PIVOT TURF	
EXPENSE		FOOTBALL/SOCCER		FOOTBALL/SOCCER	
Initial Installation		\$	1,386,681	\$	1,644,175
Maintenance		\$	50,000	\$	-
Water Usage		\$	20,000	\$	-
Total Annual Maintenance Cost		\$	70,000	\$	1,000
Total Cost of Ownership over 12 Years		\$	2,226,681	\$	1,656,175
Total Hours Permitted Use in 12 Year Cycle*			5,808		42,432
Cost Per Hour of Use		\$	383.38	\$	39.03

Natural grass installation and maintenance provided by Byrom-Davey, a leading installer of natural grass and artificial turf fields in Southern California.

Source: Study conducted by Tom Diehl of CHA Consulting examining actual costs of ownership of public natural grass sports fields in Los Gatos, CA.

* Hours of use permitted calculations by CHA:

Natural Grass: 20 hours per week for 32 weeks per year, less 15% for rain, with downtime for resodding

Pivot: 68 hours per week for 52 weeks per year, no rainouts, no downtime for replacement

The Facts on Turf

Say "NO" to unnecessary turf bans and restrictions.



Eliminating turf doesn't make sense.

There have been numerous studies by government agencies, and there is not **one** single study citing health risks of artificial turf. Here is a partial list of agencies that have conducted studies citing no elevated health risk from artificial turf:

- The United States Environmental Protection Agency
- The US Consumer Product Safety Commission
- The US Centers for Disease Control
- Netherlands National Institute of Health and Environment
- The European Chemicals Agency
- Connecticut Department of Public Health

Restricting turf doesn't make sense. While concerns have been voiced about PFAS content in turf, microplastics, heat island effect and recyclability, the latest generation of turf already alleviates these issues. Here are some facts to know:

PFAS

- Turf is not a significant exposure point to PFAS. Importantly, TenCate manufactures turf without PFAS! Other brands of turf typically contain 100 parts per million or less (ppm).
- Many daily use items have far more PFAS content than turf.
 - Dental floss: up to 248,900 ppm
 - Prescription medications: up to 50,000 ppm
 - Makeup: up to 6,000 ppm
- "Natural" grass often requires fertilizers, pesticides and herbicides that may contain — or even be classified as — PFAS. Easily transported by irrigation and rain, they can enter soil and waterways, potentially contaminating precious and limited drinking water.
- There is absolutely NO evidence that any PFAS in water sources has ever come from turf. However, it is a certainty that there are PFAS in water sources that have come from chemicals used to maintain natural grass.



Microplastics

New generations of turf don't have infill. This eliminates migration of infill materials and reduces microplastic shedding to negligible amounts without the abrasion that causes fiber breakdown.

Heat Island Effect

Our newest turf, Pivot®, requires NO infill and hence does not act as a heat sink like traditional artificial turf fields with tons of rubber infill. Further, technologies like TenCate's GeoCool™ cooling additive can lower turf temperatures significantly. GeoCool absorbs moisture to keep the surface cool; additionally, it is both natural and renewable making it very sustainable.

Recyclability

With advanced recycling technology, turf is now 100% recyclable and can be turned into new, consumer-grade products. On top of that, turf offers some meaningful benefits.

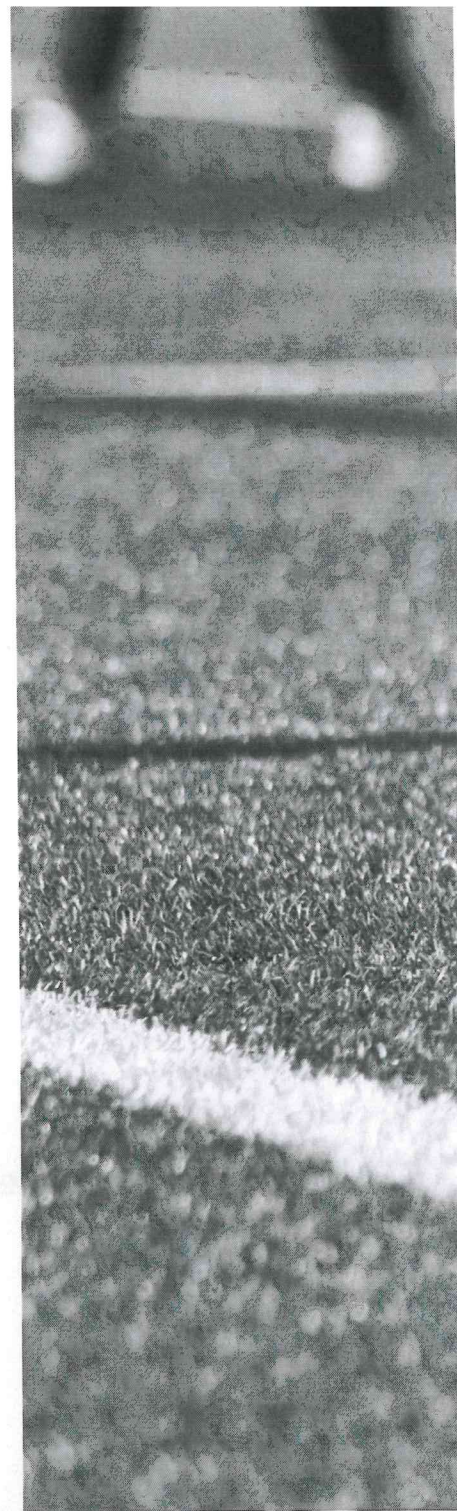
Here are some facts around what we stand to lose if access to turf is restricted:

Water

- Many areas around the country have water restrictions. Natural grass requires an enormous amount of water.
- Artificial turf saves between 500,000 to one million gallons of water per field per year. With over 20,000 turfed sports fields in the US, that's approximately 10-20 billion gallons of water saved annually.

Play

- Without turf, our communities lose access to playing fields and will need to depend on natural fields. Grass fields are likely going to go unmaintained during droughts, which will make them unplayable and possibly dangerous to athletes.
- Participation in sports increases physical, emotional and mental well-being and the likelihood of attending college. It reduces crime and decreases instances of drug use in youth.
- Turf democratizes play by providing sustainable and affordable play surfaces where natural grass won't work.



Banning artificial turf WILL NOT reduce PFAS exposure in the environment and isn't needed in order to avoid microplastics or the heat island effect associated with leisure surfaces. What's worse is that it restricts access to the benefits turf provides.

Let's encourage our legislation to rethink turf bans and #ProtectPlay.

January 9, 2024

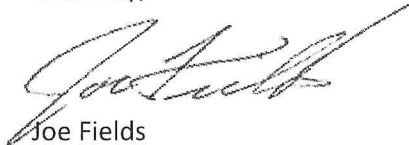
To our valued customers:

I am extremely pleased to announce that TenCate is now manufacturing our top-of-the-line artificial grass without the use of PFAS as a component or processing aid.

Our team performed an in-depth review of how we manufacture our synthetic turf. Engineers discovered a manufacturing processing aid used in fiber extrusion that contained trace levels of non-soluble PFAS and were able to replace it with one that does not contain PFAS. To note, previous third-party testing showed our artificial turf had non-soluble PFAS levels that were far lower than what have been found in consumer products like dental floss and prescription medications.

We are committed to giving our customers complete peace of mind and are dedicated to making the most innovative, highest quality turf that is both safe and sustainable, and this advancement is one more pivotal way we are accomplishing our mission.

Sincerely,



Joe Fields
President and CEO
TenCate Americas
j.fields@tencategrass.com

MSC 3/24 Re: Item #1

From Laura Fleming

Date Tue 6/23/2026 12:19 PM

To Gao, Beilei <bgao@cityofpasadena.net>

Cc Lyon, Jason <jlyon@cityofpasadena.net>

You don't often get email from

[Learn why this is important](#)

[A] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you **know** the content is safe. Report phish using the Phish Alert Button (PAB). For more information about the PAB view article "KB0011474" on the DoIT portal.

Re: Artificial turf installations in Pasadena

Dear City of Pasadena Municipal Services Committee:

My name is Laura Fleming. I'm a Pasadena resident in District 7. I am the Environmental Sustainability Manager at Polytechnic School and also serve on the Environmental Advisory Commission.

Installing, or re-installing artificial turf in any setting is not a responsible choice for Pasadena and its residents.

I empathize with the challenges for the Parks, Recreation and Community Services Department to meet demand for playing fields. I do not, however, feel that the benefits of a few more playable days per year with artificial turf outweighs the public and environmental health risks.

Heat

- When we consider downtime due to rain, we must also evaluate downtime due to excessive heat. When air temperatures reach 90 degrees, artificial turf temperatures are 140 - 170 degrees.
- Geo infill may reduce temperatures but plastic turf will always be significantly hotter than natural grass.
- In March of this year, Pasadena experienced five unplayable days due to excessive heat. Currently Pasadena has 30 days when temperatures reach 90 degrees or higher. According to a report by UCLA scientists, by 2050 Pasadena may see an additional month of temperatures higher than 95 degrees. We must plan for the future and install surfaces that help cool our City, not create more heat islands.

Costs

- When the MSC evaluates costs for artificial turf vs natural grass, please take a longer view and look at projections over a 16 or 24 year period since artificial turf has a lifespan of approximately

eight years. Returning a field to natural grass may initially cost as much as a new artificial turf installation, but that is a one time expense due to the high cost of removing the existing synthetic system and installing irrigation. Once converted back to natural grass, there will be annual maintenance costs (for both surfaces), but artificial turf fields need to be replaced every 8 years for \$1- \$2 million or more, depending on the field size. At a time when the City is experiencing a budget deficit, artificial turf isn't a responsible fiscal choice.

- Geo infill is also more expensive - for a standard 85,000 s.f. field, this will add roughly \$80,000 - \$130,000 for the infill alone. I do not see these increased infill costs reflected in the stated projections for artificial turf. In fact, the original artificial turf field cost was shared by the PRCS Director at a Commission meeting on December 3, 2024 (during discussion) and has not changed since then.

PFAS

- And what brand of artificial turf would be sourced that does not contain PFAS? The public deserves to know what is being proposed. Brands that are now claiming to be PFAS free are also more expensive.

Recyclability

- Artificial turf has not been recyclable to date. The public deserves more information about these claims of recyclability.

Pasadena has been making bold decisions to mitigate our climate impacts. Why would we install and re-install surfaces with known heat island effects and that contribute significant greenhouse gas emissions across their lifecycle through production, transport and disposal?

It's time to make a responsible decision for Pasadena and reject artificial turf, developing an ordinance to ban artificial turf for residential, commercial and City-owned properties.

Sincerely,

Laura Fleming
District 7

Villa Parke Turf Field -- Community Member Input

From Alysa

Date Tue 6/23/2026 1:00 PM

To Gao, Beilei <bgao@cityofpasadena.net>

You don't often get email from

[Learn why this is important](#)

[A] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you *know* the content is safe. Report phish using the Phish Alert Button (PAB). For more information about the PAB view article "KB0011474" on the DoIT portal.

To Whom It May Concern,

My children go to school and play soccer in Pasadena, and I am concerned that Pasadena's Municipal Services Committee is being asked to replace the synthetic turf field at Villa Parke with turf instead of grass. A grass field would serve our community much better for many important reasons.

Artificial fields release microplastics which do not break down--- they break *up* into smaller and smaller pieces that can take centuries to eliminate. These microplastics pose serious environmental and health threats to your constituents. I hope that when making this decision Pasadena's MSC will play the long game. Young people like my children are counting on you to prioritize giving the athletes who play at Villa Park a better future over the few minor inconveniences that come with grass fields.

My kids have played soccer in Pasadena for years with AYSO Region 13 (where I've also been a coach) and TFA and FCGS Clubs, and I know that playing on turf fields is very uncomfortable for them. The sun warms the plastic grass to high temperatures, heating the bottom of their cleats. After the games, their feet will be pink and raw from being scalded every time they take a step. It is not a fun experience. Their teams are always disappointed when we hear that a game will be played on an artificial grass field. The fans and parents are equally averse because of the sweltering heat on turf sidelines.

The point of an athletic facility is to serve the athletes who play there and the community; to foster a safe and fun athletic environment. By that logic, I urge you to replace Villa Parke's turf field with real grass.

I appreciate all that you do to listen to community members who are directly affected by your choices.

Thank you for your time and consideration,

Alysa Nahmias-Carmichael
Concerned Resident



Outlook

EAC Letter and Pasadena Beautiful on Artificial Turf

From Lauren Siegel

Date Tue 6/23/2026 1:05 PM

To Official Records - City Clerk <OfficialRecords-CityClerk@cityofpasadena.net>

 2 attachments (422 KB)

Pasadena Beautiful Foundation Remarks to Recreation and Parks Commission Meeting December 3.pdf; 2024-09-10 EAC Artificial Turf Memo to Council with Figure-4.pdf;

Some people who received this message don't often get email from

[Learn why this is important](#)

[A] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you **know** the content is safe. Report phish using the Phish Alert Button (PAB). For more information about the PAB view article "KB0011474" on the DoIT portal.

Please make sure the EAC letter on Artificial Turf and Pasadena Beautiful Letter are included on the MSC agenda for tonight.

Thanks,
Lauren Siegel

--

Lauren Siegel
MS Sustainable Development and Resource Management
Pasadena Environmental Advisory Commissioner
[linkedin.com/in/siegell/](https://www.linkedin.com/in/siegell/)

**Pasadena Beautiful Foundation Remarks
to Recreation and Parks Commission –Review of Artificial Turf Issue**

December 3, 2024 Meeting

Pasadena has been an aspirational City since its creation in 1886. Founded with a focus on architecture, education, the arts and a love of interesting events, Pasadena is a beautiful and multi-faceted City. We need to ensure that decisions made now to protect the assets within our City are consistent with our “history, culture and unique character” as specified in our City’s Mission Statement. Our City’s Vision Statement also focuses on providing “great neighborhoods and opportunities” for all.

With our historic focus on science and technology and our unique nexus to the Jet Propulsion Lab which is a global leader in evaluating environmental data, we are at the very center of a living laboratory that we need to continue to honor and appreciate. Notably, Pasadena has been a leader in the nation as recognizing the value of a lush canopy of trees along our streets and in our parks. These beautiful living biosystems are valued, nurtured and protected. They are not a luxury. They are a necessity.

The analysis of the desirability of robust biosystems applies equally to the green spaces in City parks we also use as athletic fields. Notably, in times gone by, all playing fields were planted with grass.

Let us also not ignore the fact that the Rose Bowl uses only natural turf within the stadium and will never bow to economic pressure to use artificial turf. Also, Area H within Brookside Park which is also heavily used for athletic events will never be converted to artificial turf because it can’t be used to park vehicles. If “environmental justice” has any meaning within the City, perhaps the location of the two parks in question should be evaluated.

Last, the California State Legislature recently passed a law allowing cities to prohibit the use of artificial turf. Though that legislation did not include regulation of artificial turf in parks, it may be just a matter of time before the obvious gap is addressed. Or the City of Pasadena could become a leader in banning artificial turf citywide.

For these reasons, Pasadena Beautiful Foundation lends its support to those who favor—and understand—the health benefits of natural turf over the artificial stuff.

For those who choose to focus solely on the dollars that will be needed to rehabilitate the fields in the parks, understand that the same analysis could be applied to the millions of dollars the City has expended over the decades to lovingly plant and maintain the thousands of City trees that cleanse our air, protect our soils from erosion and reduce air temperatures. And that is just the beginning of the graceful dance between biosystems that support our very existence, hidden underneath fields of grass and the trees we lavish with attention.

Perhaps there has never been a better time for the City of Pasadena to restate firmly and clearly that our “unique character” and our desire for “great neighborhoods” require us to act in the best interests of our environment in no uncertain terms. Restore natural turf fields to our playgrounds. Teach our children that a simple green field is a living laboratory essential for our good health and wellbeing.

Respectfully submitted,

Joan Aarestad
Chair, Sustainability Committee
Pasadena Beautiful Foundation

Sara Edwards
President
Pasadena Beautiful Foundation

Memorandum

To: Pasadena City Council
From: Environmental Advisory Commission
Date: September 13, 2024
Re: Recommendations and Background on Artificial Turf in the City of Pasadena

1. Executive Summary

Plastic artificial turf (also known as “synthetic turf” or just “artificial turf”), much like lead paint, DDT, and asbestos, represents a once-promising innovation that has since raised significant concerns regarding environmental and public health and safety. Initially introduced as a low-maintenance alternative to natural grass, artificial turf was celebrated for its durability and ability to provide consistent, year-round playing surfaces, and the look of green grass without the commitment of water and fertilizers. However, as was the case with other seemingly-promising innovations, the long-term health risks and environmental impacts associated with artificial turf are now becoming unavoidably apparent.

In the case of artificial turf, the toxicity of materials used in its production, including in the infill, which is often made from shredded rubber tires, have raised alarm. Studies show that exposure to chemicals in artificial turf, including lead and other heavy metals and forever chemicals, poses risks to athletes, children, the public, and contamination of our water supply. Dangerous heat conditions arise since artificial turf gets significantly hotter than natural grass, increasing the urban heat island effect and leading to thermal burns and heat stress. Biodiversity loss and tree root suffocating derives from no organisms living under artificial turf. These concerns echo the historical pattern of substances initially embraced for their practicality, only to later reveal serious public health and environmental consequences.

For the reasons set forth below, after several months of study, research, testimony, and discussion at Commission meetings, the Environmental Advisory Commission recommends that the Pasadena City Council take the following steps relating to artificial turf in the City of Pasadena:

A. Recommendations for Residential, Commercial, and Institutional Settings:

- Adopt an ordinance that would put a moratorium on new installations or replacement installations of artificial turf for landscaping in residential properties, commercial and institutional settings.
- Direct Pasadena Department of Water and Power to explore incentives and rebate programs to remove and replace artificial turf in residential, commercial and institutional settings with drought-tolerant native plants.

B. Recommendations for City-Owned Property, Including Parks and All City Landscaping:

- Adopt an ordinance that would put a moratorium on new installations or replacement installations of artificial turf for City-owned property, including parks and City landscaping.

- While artificial turf still exists in City-owned parks, direct the Parks and Recreation and Public Works Departments in coordination with the Public Health Department to (1) establish policies for the safe utilization of artificial turf to prevent burn injuries, heat stress, and dehydration; and (2) educate the public by conducting a series of information sessions about the environmental and public health safety concerns of artificial turf playing fields, including exposure to PFAS and extreme heat conditions.
- Direct the Public Health Department to conduct a Health Impact Assessment (HIA) on artificial turf to study potential adverse health impacts of artificial turf both directly and due to contamination to natural resources caused by artificial turf. (An HIA is a tool designed to investigate how a proposed program, project, policy, or plan may impact health and well-being and inform decision-makers of these potential outcomes. An HIA in this context will aid the City in determining what, if any, future planning and actions should occur to mitigate health effects from existing artificial turf installations.)

2. Background - What is Artificial Turf?

Artificial turf is made of plastic, a petrochemical product designed as a substitute for natural grass. Plastics are derived from chemicals produced through the combustion of fossil fuels like oil and gas. Energy-intensive processes, including extraction, refining, and manufacturing, transform these fossil fuels into plastics, which are then used to produce both the grass-like blades and the backing materials in artificial turf installations.

There are three main components of artificial turf:

- **Blades:** The plastic blades are made by melting nylon, polypropylene or polyethylene pellets and mixing them with other chemicals and additives to achieve desired color. The melted mixture is shaped into strands and spun into a yarn that is then sewn into a mesh material.
- **Backing layers:** These layers are derived from various types of plastics such as polyester, polyurethane, polypropylene and latex to support the blades and provide stability and drainage.
- **Infill:** This granular material is spread between the blades to keep the blades upright and provide shock absorption. The most common types of infill are rubber crumb (made from shredded end-of-life automobile tires) and sand.

3. Environmental and Public Health Concerns of Artificial Turf Installations

A. Dangerous Heat Conditions and Urban Heat Islands

Turf Heats Up More than Grass: Numerous studies confirm that plastic turf gets significantly hotter than natural grass, regardless of the type of fibers or infill used. Penn State research shows surface temperatures of synthetic turf can reach 140-170°F.¹ A study by Brigham Young University found synthetic turf to be 37°F hotter than asphalt and 87°F hotter than natural grass.² Unlike artificial turf, grass cools itself and the surrounding air through water evaporation. (See Figure 2 of temperatures of artificial turf and grass at Villa Park).

¹ (Abraham, 2019; Claudio, 2008; NPRA, 2019)

² (Williams & Pulley, 2002)

Plastic Turf Increases Urban Heat Island Effect: Urban areas are already warmer than surrounding regions due to heat retention by buildings and pavement. Artificial turf contributes to this by trapping and radiating heat, creating dangerous conditions for users, and raising temperatures in surrounding neighborhoods. According to Kelly Turner of UCLA's Heat Equity Initiative, plastic turf is one of the hottest materials, retaining heat longer than asphalt.³ (See Figure 1 of Urban Heat Island Effect at Jackie Robinson Park)

Climate Change Will Make Plastic Turf Even Hotter: As global temperatures rise, Pasadena will experience more frequent days above 90°F. It is critical to address how artificial turf contributes to worsening conditions.⁴

B. PFAS and Microplastic Pollution

Toxic "Forever Chemicals": Plastic turf contains PFAS (per- and polyfluoroalkyl substances), chemicals that persist in the environment and have been linked to cancer, hormonal issues, neurotoxicity, and developmental delays in children. All artificial turf tested has contained PFAS.⁵ In addition, the infill, typically made of shredded tires made from end-of-life automobile tires, is extremely toxic, containing, among other substances, heavy metals and volatile organic compounds.⁶

Risks of Cumulative Exposure: Athletes frequently in contact with plastic turf, such as soccer players and goalies, face higher risks of exposure to PFAS through skin contact, inhalation, and ingestion.

Contamination of Water Systems: Runoff from plastic turf fields carries PFAS into storm drains, polluting Pasadena's water supply, which could be both difficult and costly to clean up. Estimates suggest cleanup would reach tens of billions of dollars, depending on the scale of the problem.⁷

Microplastic Pollution: Plastic turf blades break off over time, releasing microplastics into drainage systems and waterways. Fields using crumb rubber infill are even worse, with studies showing 85% of water samples near such fields contain microplastics.⁸

C. Greenhouse Gas Emissions

Plastic Turf's Carbon Footprint: Greenhouse gasses are emitted from artificial turf continuously throughout its lifespan, in the extraction, storage, transportation and energy-intensive manufacturing processes, as well as off-gassing methane and ethylene while

³ <https://innovation.luskin.ucla.edu/climate/heat-equity/>.

⁴ California Healthy Places Index: Extreme Heat Edition, available at: <https://heat.healthyplacesindex.org/>.

⁵ What are the health effects of PFAS? Agency for Toxic Substances and Disease Registry, available at: <https://www.atsdr.cdc.gov/pfas/health-effects/index.html>; Our Current Understanding of the Human Health and Environmental Risks of PFAS, EPA, available at: <https://www.epa.gov/pfas/our-current-understanding-human-health-and-environmental-risks-pfas>.

⁶ Health Impacts of Artificial Turf: Toxicity Studies, Challenges, and Future Directions, available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10262297/>.

⁷ "Groundbreaking study shows unaffordable costs of PFAS cleanup from wastewater," Minnesota Pollution Control Agency, available at: <https://www.pca.state.mn.us/news-and-stories/groundbreaking-study-shows-unaffordable-costs-of-pfas-cleanup-from-wastewater>.

⁸ (Korbol, 2018).

in use and as it degrades. Solar radiation triggers the off-gassing from artificial turf and it continues long after dark.⁹ Methane is 80% more powerful at trapping heat than CO₂ and a significant contributor to global warming.

Life Cycle Emissions: A recent study¹⁰ found one artificial turf field emits 527 tons of CO₂ equivalents over its life cycle.

D. Carbon Absorption and Biodiversity Loss

Loss of Carbon Sink: Plastic turf installations eliminate natural spaces that would otherwise absorb carbon, hindering Pasadena's climate goals.

Biodiversity Loss: Plastic turf kills soil microorganisms and displaces habitats for pollinators and wildlife, worsening the biodiversity crisis. Nothing can thrive in plastic grass.

Harm to Trees: Plastic turf covering the ground near tree roots suffocates the soil, depriving trees of essential nutrients. Preserving Pasadena's tree canopy is critical for climate mitigation.

E. Public Safety and Injuries

Thermal Burns: Playing on plastic turf in high heat can cause first-degree burns at 118°F and second-degree burns at 131°F. Hot artificial turf can melt shoes, blister skin, and cause dehydration or heatstroke.

Plastic "Turf Burns": Friction injuries from sliding on plastic turf are common and can lead to bacterial infections like MRSA. Artificial turf causes a two-to-threefold increase in skin abrasions compared to natural grass.¹¹

Increased Injury Rates: NCAA football players are nearly three times more likely to suffer ligament tears on artificial turf than grass. NFL players also experience a 16% increase in lower extremity injuries on artificial turf.¹²

F. Lack of Recyclability

Plastic Waste: At the end of its life, plastic turf becomes non-recyclable plastic waste, emitting methane in landfills. A typical 80,000 sq. ft. plastic turf field contains 40,000 pounds of plastic.¹³

G. Water Use and Maintenance Costs

High Water Usage: Artificial turf is often touted as a water-saving alternative to grass. However, in hot climates like ours, water is regularly required to cool the surface of artificial turf, which can

⁹ "Synthetic turf will contribute to greenhouse gas problems" MV Times, available at: <https://www.mvtimes.com/2019/02/20/synthetic-turf-will-contribute-greenhouse-gas-problems/>.

¹⁰ "Analysis of energy use and emissions of greenhouse gasses, metals and organic substances from construction materials used for artificial turf" available at: <https://www.sciencedirect.com/science/article/abs/pii/S0921344917300861>

¹¹ (California Office of Environmental Health Hazard Assessment, 2010).

¹² American Journal of Sports Medicine, 2019, available at: <https://pubmed.ncbi.nlm.nih.gov/30995074/>.

¹³ (Beyond Plastics, 2024).

reach 140-170°F. Water is also regularly required to remove pollution, bodily fluids, animal waste and bacteria from the surface of artificial turf. Given these factors, the water usage for artificial turf can easily match or exceed that needed to maintain natural grass.¹⁴

Replacement Costs: Plastic turf must be replaced every 8-12 years, with replacement costs ranging from \$300,000 to \$650,000 for football or soccer fields.¹⁵

H. Environmental Justice

Pasadena's Environmental Justice Element requires fair treatment for all residents in implementing environmental policies. Artificial turf fields in Robinson Park and Villa Parke create urban heat islands in neighborhoods where some of Pasadena's most disadvantaged residents live, raising utility bills and worsening health conditions for low-income communities.

4. Other Municipalities Adopting Similar Ordinances

The cities of Millbrae and San Marino have already begun establishing moratoriums for new artificial turf installations. Other California cities and counties such as Los Angeles, Sunnyvale and Santa Clara County are considering artificial turf bans.

5. Conclusion

Based on the significant environmental and public health concerns we have outlined related to artificial turf installations, the EAC firmly believes that keeping this substance in our city is not a responsible choice for Pasadena. The Commission believes that allowing new installations or re-installations of artificial turf is not in alignment with the City of Pasadena's Climate Action Plan and makes it more difficult for the City to achieve its goals for climate change mitigation, adaptation and readiness.

We urge the City Council to act, adopting the recommendations we have put forward: Placing a moratorium on new and replacement installations of artificial turf for residential, commercial, institutional, and City-owned properties, conducting a Health Impact Assessment of artificial turf and establishing safe utilization policies for park field usage while the product still exists within the City of Pasadena.

¹⁴ <https://www.turi.org/publications/artificial-turf/>.

¹⁵ <https://sportsvenuecalculator.com/knowledge/artificial-turf-field/turf-field-replacement-and-recycling/>.

Figure 1. Villa Parke Temperatures on Artificial Turf vs Grass on September 2nd, 2024

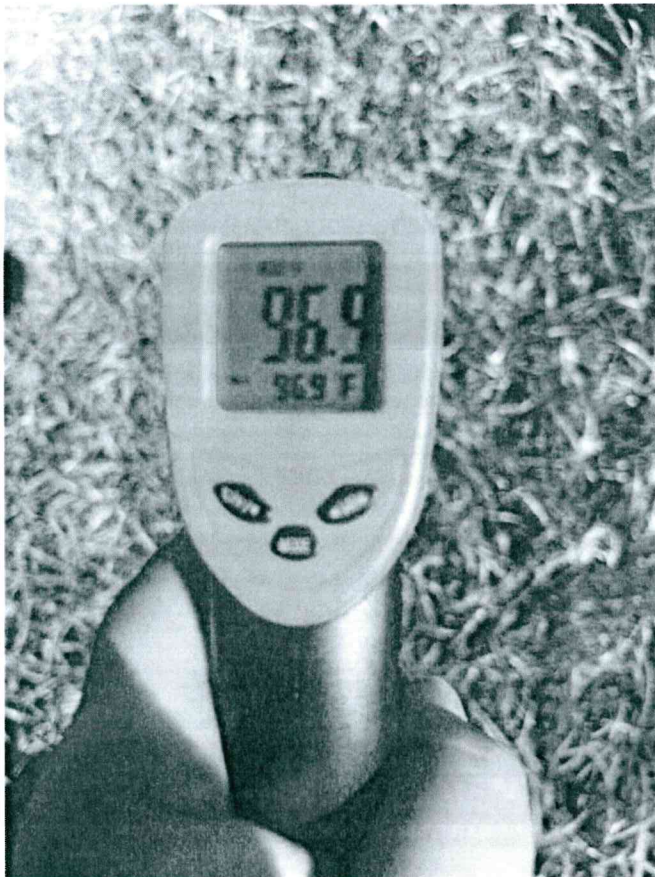
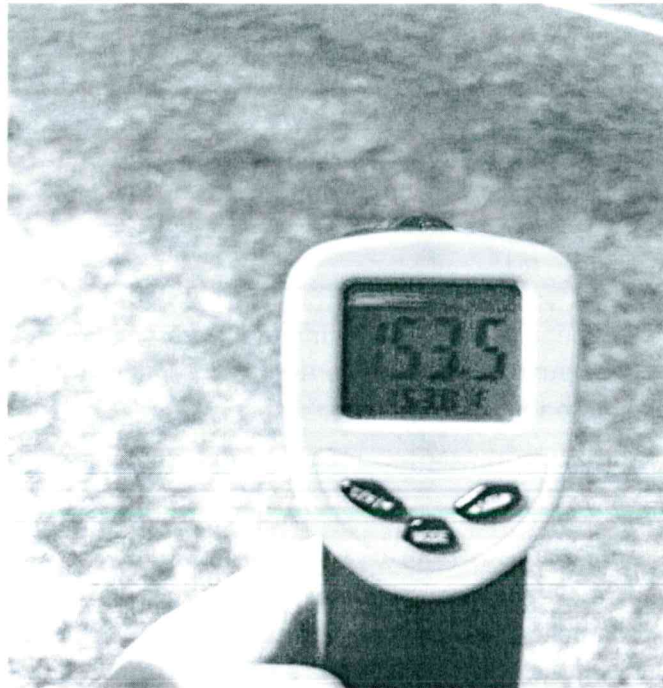
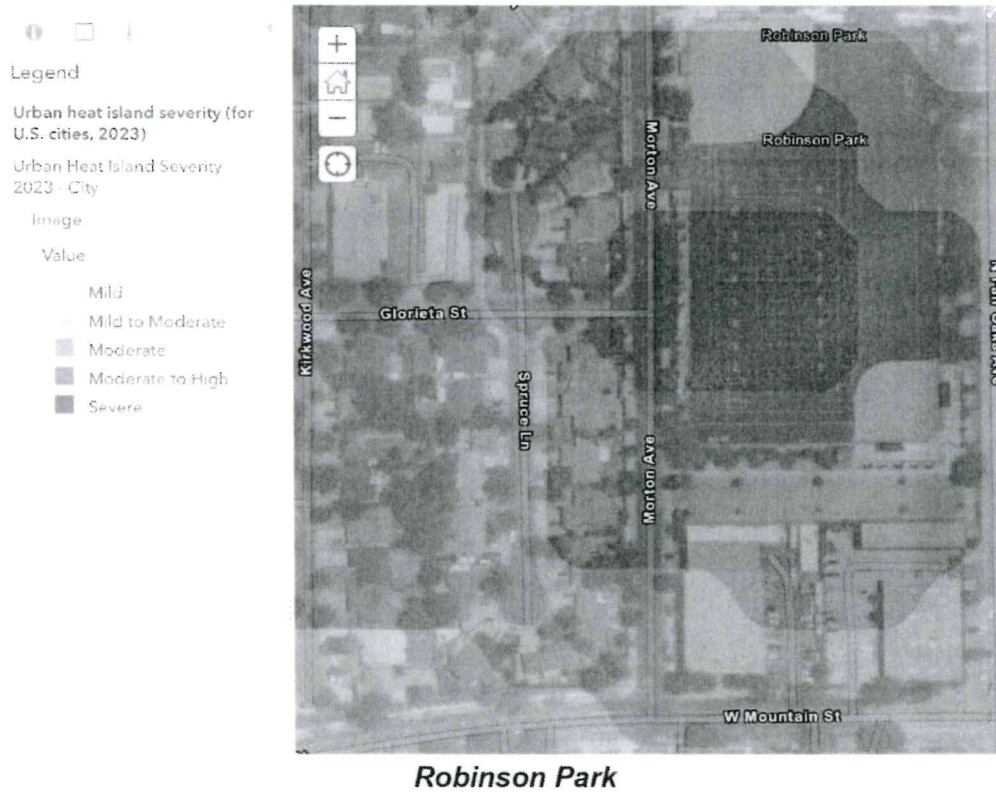


Figure 2 ([Safe Healthy Playing Fields Memo to EAC, August 2024](#))

Heat Island over Robinson and Villa Parks synthetic turf fields extending over surrounding areas:





Outlook

Please Support a Municipal Moratorium on Plastic Fields

From Wesley Reutimann

Date Tue 6/23/2026 2:12 PM

To Gao, Beilei <bgao@cityofpasadena.net>

Cc Hampton, Tyron <thampton@cityofpasadena.net>; Cole, Rick <rcole@cityofpasadena.net>; Jones, Justin <jjones@cityofpasadena.net>; Lyon, Jason <jlyon@cityofpasadena.net>

[A] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you *know* the content is safe. Report phish using the Phish Alert Button (PAB). For more information about the PAB view article "KB0011474" on the DoIT portal.

Dear Members of the Pasadena Municipal Services Committee,

As a Pasadena resident with two children who play soccer on local fields, **I urge you to place a moratorium on the use of artificial turf in Pasadena parks and city facilities.**

Artificial plastic fields routinely reach temperatures of 140–180°F on hot days – conditions that are becoming more common and pose serious risks of burns, heat exhaustion, and heat stroke, especially for children and athletes. Artificial turf also sheds microplastics and can expose users to harmful chemicals from crumb rubber infill, including heavy metals and other toxic compounds. These materials then enter our stormwater system, environment, and waterways, contributing to long-term public health concerns.

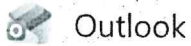
Unlike living grass, **synthetic fields provide no cooling or environmental benefits.** They do not cool the air, support biodiversity, or absorb stormwater, and may worsen flooding. They also create significant waste, as fields must be replaced every 8–10 years and are not recyclable.

Natural grass fields are the safer, cooler, and more future-proof choice for our community.

Sincerely,

Wesley Reutimann

Pasadena 91103



Outlook

MSC Comment - Item #2 - Please Support a Municipal Moratorium on Plastic Fields

From Kelsy Wakefield >

Date Tue 6/23/2026 2:17 PM

To Gao, Beilei <bgao@cityofpasadena.net>

Cc Hampton, Tyron <thampton@cityofpasadena.net>; Cole, Rick <rcole@cityofpasadena.net>; Jones, Justin <jjones@cityofpasadena.net>; Lyon, Jason <jlyon@cityofpasadena.net>

[You don't often get email from <https://aka.ms/LearnAboutSenderIdentification>]

Learn why this is important at

[△] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you know the content is safe. Report phish using the Phish Alert Button (PAB). For more information about the PAB view article "KB0011474" on the DoIT portal.

Dear Members of the Pasadena Municipal Services Committee,

I urge you to place a moratorium on the use of artificial turf fields in Pasadena parks and city facilities.

These "fake fields" routinely reach temperatures of 140–180°F on hot days – conditions that are becoming more common – posing serious risks of burns, heat exhaustion, and heat stroke, especially for children and athletes. In contrast, natural grass remains significantly cooler.

Artificial turf also sheds microplastics and can expose users to harmful chemicals from crumb rubber infill, including heavy metals and other toxic compounds. These materials then enter our stormwater system, environment, and waterways, contributing to long-term public health concerns.

Unlike living grass, synthetic fields provide no environmental benefits. They do not cool the air, support biodiversity, or absorb stormwater, and may worsen flooding. They also create significant waste, as fields must be replaced every 8–10 years and are not recyclable.

Natural grass fields are the safer, cooler, and more future-proof choice for our community.

Sincerely,



Outlook

MSC Comment - Item #2 - Please Support a Municipal Moratorium on Plastic Fields

From Ana Sanchez

Date Tue 6/23/2026 3:27 PM

To Gao, Beilei <bgao@cityofpasadena.net>

Cc Hampton, Tyron <thampton@cityofpasadena.net>; Cole, Rick <rcole@cityofpasadena.net>; Jones, Justin <jjones@cityofpasadena.net>; Lyon, Jason <jlyon@cityofpasadena.net>

[You don't often get email from
<https://aka.ms/LearnAboutSenderIdentification>]

Learn why this is important at

[△] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you know the content is safe. Report phish using the Phish Alert Button (PAB). For more information about the PAB view article "KB0011474" on the DoIT portal.

Dear Members of the Pasadena Municipal Services Committee,

I urge you to place a moratorium on the use of artificial turf fields in Pasadena parks and city facilities.

These "fake fields" routinely reach temperatures of 140–180°F on hot days – conditions that are becoming more common – posing serious risks of burns, heat exhaustion, and heat stroke, especially for children and athletes. In contrast, natural grass remains significantly cooler.

Artificial turf also sheds microplastics and can expose users to harmful chemicals from crumb rubber infill, including heavy metals and other toxic compounds. These materials then enter our stormwater system, environment, and waterways, contributing to long-term public health concerns.

Unlike living grass, synthetic fields provide no environmental benefits. They do not cool the air, support biodiversity, or absorb stormwater, and may worsen flooding. They also create significant waste, as fields must be replaced every 8–10 years and are not recyclable.

Natural grass fields are the safer, cooler, and more future-proof choice for our community.

Sincerely,
Ana De La Torre

Sent from my iPhone



Outlook

Special Meeting 23 June 2026, Synthetic Turf. FOR THE PUBLIC RECORD

From D Woelke

Date Tue 6/23/2026 3:32 PM

To Gao, Beilei <bgao@cityofpasadena.net>

 3 attachments (10 MB)

General letter June 2026.pdf; synthetic turf flyer Spanish.pdf; Synthetic Turf flyer.pdf;

You don't often get email from

 [Learn why this is important](#)

[A] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you **know** the content is safe. Report phish using the Phish Alert Button (PAB). For more information about the PAB view article "KB0011474" on the DoIT portal.

Dear Chair, Vice Chair, and Members of the MSC Committee:

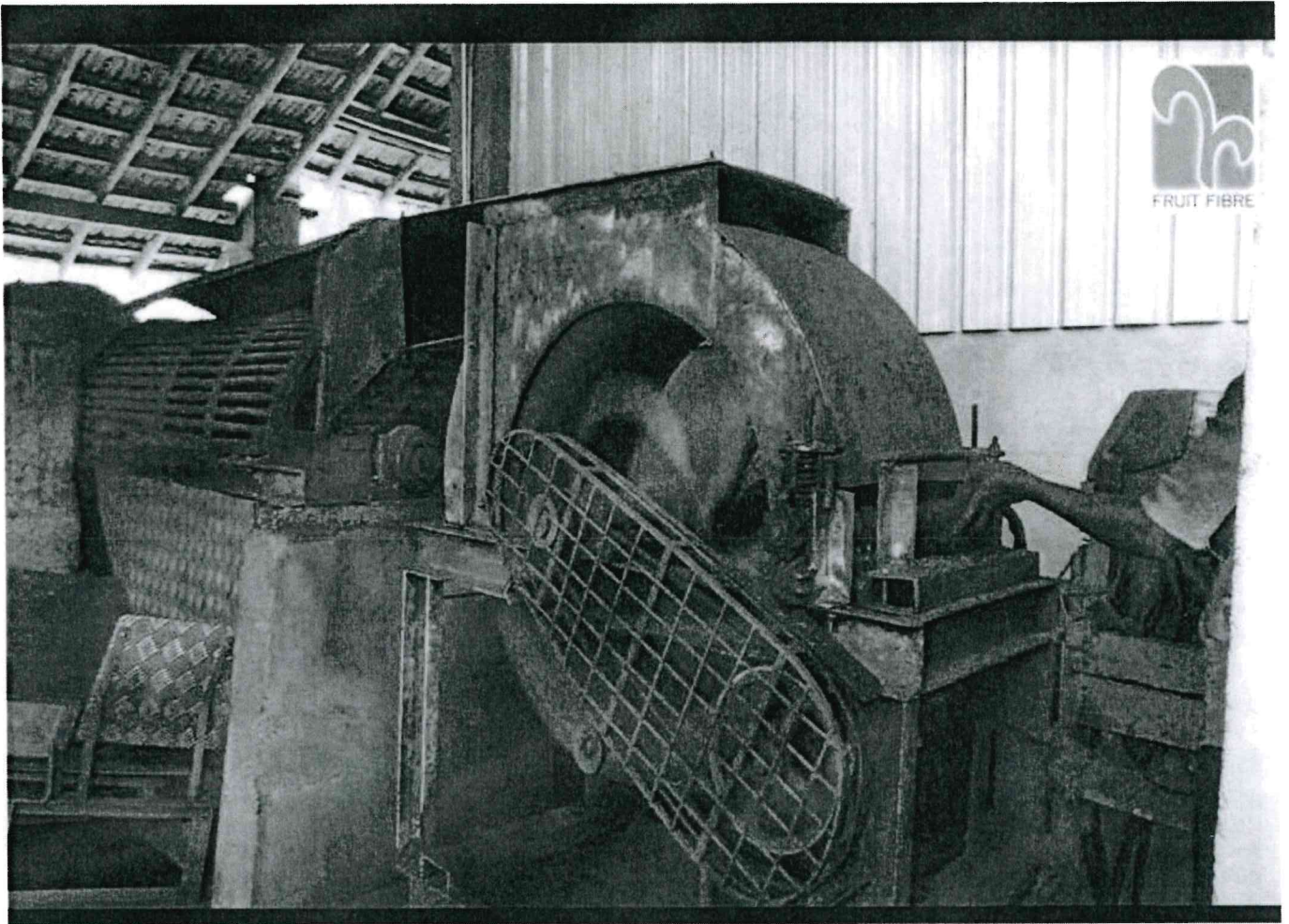
We are writing to you today with grave concerns regarding the judgement made by the Director of Parks and Recreation is making for materials to be used in the City of Pasadena, a severe wildfire zone, as well as the sports, or greenwashing, that has been disseminated for years, even predating tenure with the City of Pasadena.

The use of coconut coir as infill, does not mitigate the highly toxic, non-communicable diseases and even cancers known to exist with use of synthetic turf. We urge you to not ignore the abundance of peer-reviewed literature, as opposed to that funded by the synthetic turf industry.

To suggest that coconut coir is acceptable as infill, is beyond all credibility. Living in a severely high risk wildfire zone should shut down all conversation regarding the infill.

Additionally, coconut coir is sourced in Indonesia. Coconut shells are put in highly polluted rivers, arguably the most polluted in the world, for 3 months. Bacteria is added, to hasten the softening, making it easier to retht the shells- remove the insides of the brown shell. This is often undertaken by mom and pop shops with dangerous, outdated machinery, which poses a risk to the machine operator. Hands and forearms have been lost.

Further, synthetic turf is a wildfire risk. It is a fossil fuel-based plastic product. More information can be found in the attached document.





We cannot express our alarm strongly enough, and urge you to reject synthetic turf for any use in Pasadena. A full ban is indicated. CA now has 5 cities with bans, with San Fernando joining the list in April of this year.

We also recommend an investigation into the undertakings that have occurred leading to the continued support of synthetic turf by the Parks and Recreation Department, which continue to become more outrageous over time.

Do the right thing for Pasadena, not for those who are trying to force a yes vote.

Dianne Woelke MSN, Board Member
Safe Healthy Playing Fields, Inc.
<https://www.safehealthyplayingfields.org>
SHPFI is an all-volunteer nonprofit 501-c-3





June 2026

To Whom it May Concern:

We, Safe Healthy Playing Fields, Inc., are writing to you about the planned installation of synthetic turf in your jurisdiction.

SHFPI) is an all-volunteer 501-c-3 nonprofit organization. We are committed to educating communities, policymakers and elected officials about the health, safety and financial realities of plastic fields versus grass fields, and other synthetic surfaces for their parks and schools. Our constituency ranges from concerned individuals to community and civic organizations, legal, healthcare and science professionals, municipal leaders and state legislators.

Synthetic turf is made primarily from polyethylene, the most highly produced and discarded plastic globally.¹

An infographic with a dark background. On the left, the text "WORRIED ABOUT PLASTIC WASTE?" is in large white bold letters. Below it, in smaller white text, is "A synthetic turf field is the equivalent of". To the right of this text are two images: the top one shows several large black plastic bags, and the bottom one shows a bundle of white plastic straws. To the right of these images are the numbers "3.2 million plastic bags" and "46 million plastic straws" in white. On the right side of the infographic, the text "Too POLLUTING!!" is in white, with "POLLUTING!!" underlined. Below this is the text "Like plastic straws & bags..." in white. At the bottom right, there is a bulleted list in white: "• Most synthetic turf is made from LDPE – low density polyethylene", "• The most highly produced plastic globally", and "• The most frequently discarded material".

In 2024, SB676-Allen was enacted, allowing local jurisdictions to ban artificial turf. A legislative analysis noted:

"...emerging research reveals that artificial turf incurs significant environmental

¹ Dixon, D (18 Aug 2018). "Plastics aren't just polluting our oceans — they're releasing greenhouse gases." UNADAP (United Nations Association for Development and Peace).
<https://www.unadap.org/post/plastics-aren-t-just-polluting-our-oceans-they-re-releasing-greenhouse-gase>

problems through pollution, chemical run-off, and lack of recyclability...[contain] PFAS, and have been linked to numerous health problems including cancer, kidney and liver damage, birth defects, and harm to children's health.”²

To date, the cities of Millbrae,³ San Marino,⁴ Carmel,⁵ San Fernando,⁶ and Beverly Hills⁷ have enacted ordinances regarding synthetic turf. A growing number other cities are considering the same.

Climate Change / Extreme Heat:

“Every Key Climate Indicator is Flashing Red. Humanity has just endured the 11 hottest years of record. When history repeats itself 11 times, it is no longer a coincidence. It is a call to act.”⁸

UN Secretary-General António Guterres, March 2026

Climate change is increasing the number of people exposed to extreme heat globally.⁹ Young children and the elderly are the most vulnerable populations.

As a fossil fuel-based, petrochemical plastic product, synthetic turf is a climate change agent, off gassing methane and ethylene day and night, in ever increasing amounts. Methane traps 90% more heat than carbon dioxide and is 21 times more potent. Land based plastics produce two times more methane and 76 times more ethylene than plastics found in waterways and oceans.^{10,11} GHG emissions from plastic turf are estimated to be 527 tons of CO₂e over a ten

² SB676-Allen. Assembly analysis (23 July 2023). Author statement.
https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202320240SB676

³ Millbrae artificial turf ordinance.

⁴ San Marino artificial turf ordinance.

⁵ Carmel artificial turf ordinance.

⁶ San Fernando artificial turf ordinance

⁷ Beverly Hills artificial turf ordinance

⁸ Conley, J (26 Mar 2026). Common Dreams: UN Climate Report.

⁹ Perkins-Kirkpatrick, Gregory, CH, Vanos, JK et al (26 Mar 2026). “Deadly heat stress conditions are already occurring.” Nature Communications; 17:2590.
<https://www.nature.com/articles/s41467-026-70485-1>

¹⁰ Royer, SJ, Ferrón, S, Wilson, ST, Karl, DM (2018). “Production of Methane and Ethylene from Plastic in the Environment.” PlosOne 13(8): e0200574.
<https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0200574&type=printable>

¹¹ Royer, SJ (12 Nov 2018). Letter to Mayor M Bowser, Washington DC regarding synthetic turf.
Letter to Mayor M Bowser

year period based on a model using a 84,830 sq ft field.¹² This does not include the entire life cycle of the plastic, from cradle to grave and complete degradation.

Climate change presents a significant risk to student athletes.¹³ An estimated 9,000 student athletes are treated for exertional heat illness each year.¹⁴ The heat from synthetic surfaces, even at reasonable ambient temperatures, can contribute to injuries due to an athlete's diminished functional level.

Heat stress is a leading cause of weather-related deaths. Extreme heat can exacerbate underlying diseases, such as asthma, cardiovascular disease,¹⁵ diabetes, mental health disorders, risk for accidents and some infectious diseases. Heatstroke is a medical emergency with a high risk for death.

Injuries: Thermal Burns

- Synthetic turf and plastic surfacing are always hotter than concrete, asphalt, natural grass and other natural surfaces
- At a surface temperature of 118°F a 1st degree burn occurs in 15 minutes, becoming a 3rd degree burn (full skin-thickness) in 20 minutes
- At a surface temperature of 140°F, a 1st degree burn occurs in 3 seconds, and 3rd degree burn in 5 seconds
- Synthetic turf readily reaches 160°F to 180°F and has reached over 200°F



¹² Magnusson, Simon, Mácsik, Josef (July 2017). *Analysis of Energy Use and Emissions of Greenhouse Gases, Metals and Organic Substances from Construction Materials Used for Artificial Turf*. Resources, Conservation and Recycling Vol. 122, July 2017, Pages 362-372
<https://doi.org/10.1016/j.resconrec.2017.03.007>

¹³ Morton, A (1 Apr 2026). "The Hetchinger Report: Climate Change Threatens Student Athlete Safety;" Hetchingerreport.org
<https://hetchingerreport.org/the-heat-is-on-as-climate-change-threatens-student-athlete-safety-states-try-to-adapt/>

¹⁴ Kerr, ZY, Casas, DJ, Marshall, SW, Comstock, RD (Jan 2013). "Epidemiology of exertional heat illness among U.S. high school athletes." J. Preventive Medicine.
pubmed.ncbi.nlm.nih.gov/23253644/

¹⁵ Huo, S, Pulido, TR, Archer, RS (8 Mar 2026). "Heat and socioeconomic deprivation compound to drive coronary heart disease in Los Angeles." Front. Public Health, Sec. Health Economics; Volume 14
<https://doi.org/10.3389/fpubh.2026.1784078>

Children are not small adults. They are more readily impacted by heat illness due to:

- Heat production – Children have higher metabolic rates than adults which leads to higher production of more heat.
- Body surface area – Younger children absorb more heat because they have a greater body area to body mass ratio. For older children and teens, increased body fat and low fitness levels can be/may be contributing factors.
- Blood circulation – Children are less able to cool their body temperature by shunting their blood from their body core to their body surface due to lower cardiac output and smaller blood volume.
- Sweat production – Children produce less sweat per gland and sweat at higher body temperatures than adults, reducing their body's ability to cool itself.
- Fluid replenishment – Children are less likely to self-regulate hydration if inadequately supervised.
- Between 2000–2019 approximately 489,000 heat-related deaths occurred annually.¹⁶
- Heat-related deaths for people over 65 years of age increased by 85% between 2000–2004 and 2017–2021.⁷⁹
- From 2010–2020, there were more than 5,000 emergency room visits and 60 deaths per year due to heat-related illness in CA.¹⁷

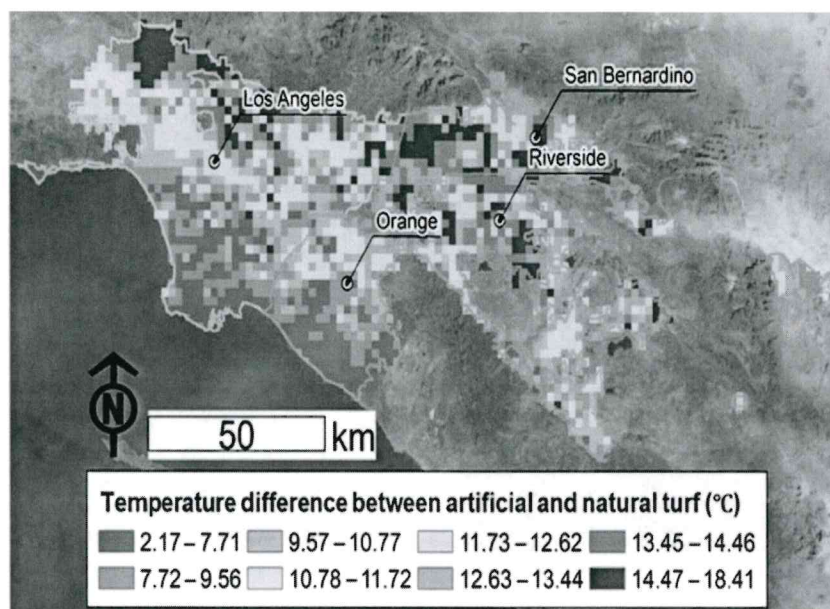
A study published in 2024 compared natural grass lawns to xeriscaped lawns, and natural grass playing fields to synthetic turf fields within 0.5 miles of each other in Los Angeles, Riverside, San Bernardino and Orange Counties. The authors note that recommending xeriscaping over drought tolerant Bermuda hybrid grasses will lead to warmer temperatures.

“During the summer, turfgrass residential lawns could be ~40°C cooler compared to artificial turf. Despite being cooler than artificial turf, xeriscape lawns could be up to 30°C warmer than natural turf lawns.”²¹

The image below is from data collected in 2013 and 2014, before the proliferation of synthetic turf, then believed to be a water saving measure during drought conditions.

¹⁶ [WHO. Climate change, heat and health. 29 Apr 2026](#)

¹⁷ California Department of Public Health.(Rev. July 1, 2024).“*CDPH Health Guidance for Schools on Sports and Strenuous Activities During Extreme Heat.*”
<https://www.cdph.ca.gov/Programs/EPO/Pages/Extreme%20Heat%20Pages/extreme-heat-guidance-for-schools.aspx>



According to research published in 2025 by the American Academy of Pediatrics, the incidence of heat related illnesses rose by 170% between 2012 and 2023.¹⁸ Research conducted by TenStrands on the impact of rising temperatures on counties, schools and students has shown a trend toward school closures or remote learning due to extreme heat. The report predicted more than 120 days of high heat, impacting some 1.6 million students would occur in at least 16 counties, and putting them at high risk for heat related illnesses by 2025, with an increasing number of extreme heat days impacting a growing number of counties, schools and students between 2025 and 2055.¹⁹

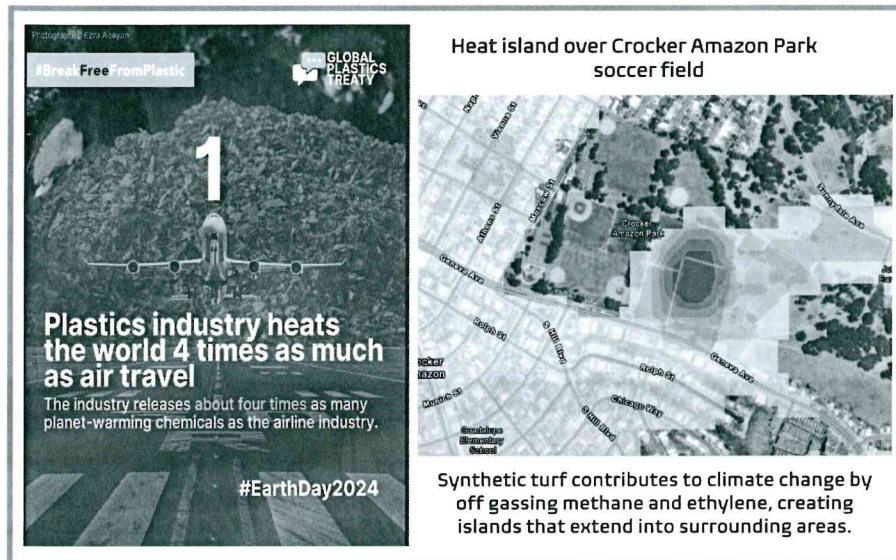
Research released in March 2026 revealed significant temperature differences in parks, schools and playgrounds in Los Angeles, with underserved areas of South Los Angeles being hotter when compared to West Los Angeles. The differences were attributed to fewer open green spaces, more concrete, and plastic playgrounds and playing fields that trap heat, with temperatures high enough to burn exposed limbs.^{20,21}

¹⁸ Merritt, TA, Bhatia, S, Solomon, C, Yu, A (Aug 2025). "Heat-Related Illness Trends at a Pediatric Health Care System, 2012 to 2023." *Academic Pediatrics*; 25,(6), 102855.
<https://www.sciencedirect.com/science/article/abs/pii/S1876285925000804>

¹⁹ Cal Data Initiative. Extreme Heat, Ten Strands

²⁰ Agatep, A, Fisher, JB, Tacazon, K et al (18 Mar 2026). "Thermal inequities in public parks and open spaces in Los Angeles determined by remote sensing." *Nature Portfolio Journal: Urban Sustain*; (6) 61.
<https://doi.org/10.1038/s42949-026-00366-5>

²¹ Douglas, JA, Fisher, JB, UCSB, Eastyards Non-Profit (6 Apr 2026). "Mapping urban heat from space reveals dangerous inequities in LA public parks." *UC Irvine News*.
<https://publichealth.uci.edu/2026/04/07/mapping-urban-heat-from-space-reveals-dangerous-inequities-in-la-public-parks/>



Extreme heat caused eight schools in Harford County, two in Montgomery County, Maryland, and 52 schools in Philadelphia, Pennsylvania, and all outdoor activities for Fairfax County, VA to close schools ahead of the end of the school year in June 2026.

Human Health Impacts:

Plastic endangers human health throughout its lifecycle.^{22,23}

- New research indicates 600 quadrillion microplastics are released annually from land based plastics, with an additional 26 quadrillion released from ocean based plastics.²⁴
- Children, other vulnerable populations, and workers are exposed to PFAS, phthalates, UV inhibitors, colorants, antimicrobials, flame retardants, and other chemicals of concern used in the manufacturing of synthetic turf, and from primary microplastic infill materials, and shedding secondary micro- and nanoplastics shed from plastic fields.
- Workers involved in fracking, ethane cracker and manufacturing plants, mining sites (silica sand), those who install, remove, and transport synthetic turf, those who work at locations collecting/selling used plastic turf carpets, and landfill workers are all at risk via dermal exposure, inhalation, and ingestion.

²² Landrigan, PJ (6 Mar 2024). "Plastics, Fossil Carbon, and the Heart." N Engl J Med;390(10),948-950. <https://www.nejm.org/doi/full/10.1056/NEJMe2400683>

²³ Landrigan PJ, Raps H, Cropper M et al (2023). "The Minderoo-Monaco Commission on Plastics and Human Health." Annals of Global Health: 89(1): 23, 1–215. <https://doi.org/10.5334/aogh.4056>

²⁴ Callaway, KR (22 Jan 2026). "Scientists just calculated how many microplastics are in our atmosphere. The number is shocking: A new estimate suggests land sources eject 600 quadrillion pieces of microplastic into the atmosphere every year." Scientific American. <https://www.scientificamerican.com/article/scientists-just-calculated-how-many-microplastics-are-in-our-atmosphere-the/>

- Microplastics have been found in virtually every human body organ and fluid. They are able to cross the blood/brain barrier, have been found in bone marrow, carotid arteries, semen, both maternal and fetal sides of the human placenta, in the stool of newborn infants, human breast milk, and more.²⁵
- Inhalation of microplastics are associated with asthma, lung fibrosis, and lung cancer.²⁶
- Microplastics are negatively impacting the cardiac health of those living in the coastal region.²⁷
- PFAS, micro- and nanoplastics have been found in sea spray.^{28,29}
- PFAS has been found to act synergistically with microplastics to cause cancer.^{30,31}
- There is an age related risk for cancer from playing on synthetic turf:

*"...there are cancer risks probability occurs as a result of chemical exposure from artificial turf. Cancer risk probability for different age categories was in the order: 7–15 years > 3–6 years > 19–22 years > 16–18 years > 23–55 years > 56–70 years."*³²

- Young soccer players in San Diego, CA were found to have PFOS (one of over 16,000

²⁵ Marfella, R, et al. "Microplastics and Nanoplastics in Atheromas and Cardiovascular Events." *The N Engl J Med*;390,(1),(900–910.
<https://www.nejm.org/doi/full/10.1056/NEJMoa2309822>

²⁶ Thapa, R, Schlesinger, MA, Panth, N et al (Jan 2026). "Inhaled microplastics and lung health: Immunopathological effects and disease implications." *Food Bioscience*;Vol. 75,108036.
<https://doi.org/10.1016/j.fbio.2025.108036>

²⁷ Makawana, B, Khadke, S, Kumar, A et al (18 Jun 2025). "Marine Microplastic Levels and the Prevalence of Cardiometabolic Diseases in US Coastline Counties." *Journal of the American Heart Association*;14(13).
<https://doi.org/10.1161/JAHA.124.039891>

²⁸ Bø, S, Johansson, JH, Tunved, P et al (15 Dec 2021). "Sea spray aerosol (SSA) as a source of perfluoroalkyl acids (PFAAs) to the atmosphere: Field evidence from long-term air monitoring." *Environmental Science & Technology*; (56), 1: 228-238.
<https://pubs.acs.org/doi/10.1021/acs.est.1c04277>

²⁹ Lambert, S, Vercauteren, M, Catarino, AI et al (15 June 2024). "Aerosolization of micro- and nanoplastics via sea spray: Investigating the role of polymer type, size, and concentration, and potential implications for human exposure." *Environmental Pollution*; (351), 124105
<https://www.sciencedirect.com/science/article/abs/pii/S0269749124008194>

³⁰ Sands, M, Sachdeva, A, Bukavina, Irudayara, J (1 Dec 2025). "Synergistic toxicity of PFAS and microplastic mixtures across five human cell lines." *Environmental Pollution*; (386)127256.
<https://www.sciencedirect.com/science/article/pii/S0269749125016306>

³¹ Cirillo, F, Giani, F, Sergi, V et al (1 Mar 2026). "The hidden threat: Microplastics and cancer biology." *Journal of Hazardous Materials*; Vol 505, 141332.
<https://www.sciencedirect.com/science/article/pii/S0304389426003109>

³² Mohammed, AMF, Saleh, IA, Abdel-Latif, NM (29 Mar 2023). "Hazard assessment study on organic compounds and heavy metals." *Heliyon*; (9), 4, e14928
<https://doi.org/10.1016/j.heliyon.2023.e14928>

- PFAS chemicals) on their hands after playing on synthetic turf.³³
- The US EPA has declared there is no safe level of PFOS.³⁴
 - PFAS can be absorbed through the skin, posing increased risk for the multiple non-communicable diseases and cancers known to be associated with PFAS.³⁵
 - Both new and used synthetic turf have been shown to cause endocrine disruption and negative cardiometabolic impacts when exposed to human cell lines.^{36,37}
 - Published in Jan 2026, 600 quadrillion (600 followed by 17 zeros) microplastic particles are released from land sources annually, in addition the estimated 26 quadrillion particles contributed to the atmosphere from ocean microplastics.³⁸
 - Due to the prolonged degradation time for plastic, synthetic turf is a consumer product that will continue polluting the environment with micro- and nanoplastics, toxic chemicals, and bacteria for centuries.³⁹
 - Products used in best management practices (BMPs) contribute more secondary micro- and nanoplastics to air, water, and soil than they prevent from leaving synthetic turf fields.
 - Synthetic turf releases 2k to 3k pounds of meso- and microplastic blades per playing field each year. Newer “no infill” versions have 16 times more blades. The plastic carpet backing and shock pads also release large amounts of microplastics.⁴⁰

³³ Amenabar, T (Mar 2024). “Study eyes safety of turf fields for kids: Scientists team up with San Diego Surf soccer club to discover if ‘forever chemicals’ pose risk.” San Diego Union Tribune, originally published in the Washington Post.
https://enewspaper.sandiegouniontribune.com/infinity/article_popover_share.aspx?guid=7f93edcb-cd5b-4f9d-b8e4-ed57343daefc&share=true

³⁴ US EPA (9 Apr 2024). Fact Sheet: “PFAS National Primary Drinking Water Regulation.”
https://www.epa.gov/system/files/documents/2024-04/pfas-npdwr_fact-sheet_general_4.9.24v1.pdf

³⁵ Ragnarsdóttir, O, Abdallah, MAE, Harrad, S (June 2024). “Dermal bioavailability of perfluoroalkyl substances using in vitro 3D human skin equivalent models.” Environment International; (188), 108722.
<https://www.sciencedirect.com/science/article/pii/S0160412024003581#ak005>

³⁶ Siegela, KR, Murraya, BR, Gearhart, J, Kassotis, CD (2024). “In vitro endocrine and cardiometabolic toxicity associated with artificial turf materials.” Environmental Toxicology and Pharmacology; (111), 104562.
<https://doi.org/10.1016/j.etap.2024.104562>

³⁷ Kassotis, C (23 Sep 2024). “Endocrine and cardiometabolic toxicity of artificial turf associated materials.” Video of presentation at NYU Langone Health symposium on plastics research.
<https://www.youtube.com/watch?v=q8MDXyQKnFA>

³⁸ Callaway, KR (28 Jan 2026). “Scientists just calculated how many microplastics are in our atmosphere. The number is absolutely shocking.” Scientific American.
<https://www.scientificamerican.com/article/scientists-just-calculated-how-many-microplastics-are-in-our-atmosphere-the/>

³⁹ Chamas, A, Moon, H, Zheng, J (3 Feb 2020). “Degradation Rates of Plastics in the Environment.” ACS Sustainable Chemistry & Engineering;(8)9.b
<https://pubs.acs.org/doi/10.1021/acssuschemeng.9b06635>

⁴⁰ Kole, PJ, Van Belleghem, F, Stoorvogel, JJ, et al (10 Dec 2023). “Tire granulate on the loose: How much escapes turf? A systematic literature review.” Science of The Total Environment; (903)166221.

- Synthetic turf blades constitute 12 to 15% of mesoplastics found in waterways and the ocean, and over 50% in near surface waters,⁴¹ as reported by researchers in Australia,⁴¹ Spain,⁴² China,⁴³ Japan,⁴⁴ Canada,⁴⁵ the United Kingdom,⁴⁶ and the US.^{47,48}
- Microplastics are both created by, and contribute to, climate change, and impede sequestration of greenhouse gasses in the ocean.^{49,50,51}
- Economic and social costs in the U.S. from plastic are conservatively estimated to be between \$436 billion and \$1.109 trillion across the entire plastics life cycle, from cradle

<https://doi.org/10.1016/j.scitotenv.2023.166221>

⁴¹ Mylius, K (11 July 2024). *"Keep the Fake Plants and Turf Out of the Surf: A call to action to reduce the use of artificial grass and plants in our cities, preserving natural greenery and its benefits, and cleaning the Ocean."* SeaBin Foundation, Australia.

<https://seabinfoundation.org/keep-the-fake-plants-and-turf-out-of-the-surf/>

⁴² De Haan, WP, Quintana, R, Vilas, C, C  zar, A et al (1 Oct 2023). *"The dark side of artificial greening: Plastic turfs as widespread pollutants of aquatic environments."* Environmental Pollution; 334, 122094.

<https://www.sciencedirect.com/science/article/pii/S0269749123010965?via%3Dihub>

⁴³ Wang, T, Li, B, Zou, X (1 Oct 2019). *"Emission of primary microplastics in mainland China: Invisible but not negligible."* Water Research; Vol. 162, Pages 214-224.

<https://www.sciencedirect.com/science/article/abs/pii/S004313541930555X>

⁴⁴ Harusato, A, Kato, M ("Mechanisms of Generation and Ecological Impacts of Nano- and Microplastics from Artificial Turf Systems in Sports Facilities." Environments; Vol 12 Issue 4 1.

<https://www.mdpi.com/2076-3298/12/4/109>

⁴⁵ Klasios, N (Aug 2025). *"Understanding and Managing Artificial Turf Impacts on Rainwater, Urban Heat, and Biodiversity for the City of Vancouver."* Sustainability Scholar Project 2025-042.

https://sustain.ubc.ca/sites/default/files/2025-042_Understanding%20and%20Managing%20Artificial%20Turf_Klasios.pdf

⁴⁶ FIDRA.org *"Defra report states artificial pitches are the main source of intentionally added microplastic pollution in the UK."*

⁴⁷ SFEI. 2024. *The Pulse of the Bay: Contaminants of Emerging Concern.* SFEI Contribution #1219. San Francisco Estuary Institute. Richmond, CA.

⁴⁸ Shahariar, NK, Haque, A, Holsen, T, Baki, ABM (14 Oct 2025). *"Land Use and Rainfall as Drivers of Microplastic Transport in Canal Systems: A Case Study from Upstate New York."*

https://www.preprints.org/frontend/manuscript/ca46e83151c4edefa27979d272ea4561/download_pub

⁴⁹ da Fonseca, EM, Gaylarde, CC (2025). *"Climate change and microplastics: a two-way interaction."* Emerg. Contam. Environ. Health; 4, 15.

<https://www.oaepublish.com/articles/eceh.2025.09>

⁵⁰ Shen, M, Huang, W, Chen, M et al (1 May 2020). *"Microplastic crisis: Un-ignorable contribution to global greenhouse gas emissions and climate change."* Journal of Cleaner Production; Vol.254, 120138.

<https://www.sciencedirect.com/science/article/abs/pii/S0959652620301852>

⁵¹ Nawab, A, Khan, MY, Ihsanullah, I, et al (Feb 2026). *"From pollution to ocean warming: The climate impacts of marine microplastics."* Journal of Hazardous Materials: Plastics; (2), 100032.

<https://doi.org/10.1016/j.hazmp.2025.100032>

to grave (fossil fuel extraction, ethane cracking, production, use, disposal, and mismanagement).⁵²

See microplastic blades shedding from sports fields [HERE](#) (12 year old AstroTurf field), [HERE](#) (3 month old TenCate Pivot field), and [HERE](#) (1.5 year old FieldTurf field).

**In humans, micro-
and nano-plastics
have been found in:**

- Arteries (clots)
- Blood
- Brain
- Breastmilk
- Bone marrow
- Feces adult/newborn
- Heart
- Kidneys
- Liver
- Lungs
- Lymph nodes
- Ovarian follicular fluid
- Penis
- Placenta fetal/maternal
- Semen
- Skeletal muscle
- Spleen
- Stomach
- Testes
- Tonsils- children
- Uterus



With babies being born pre-polluted with both microplastics and per- and polyfluoroalkyl substances, known as PFAS or “Forever Chemicals”, and the rising rate of childhood cancers, why would you want to contribute to further pollution of young minds and bodies?

Based on data from 2018, the health care related burden of plastic related to disease in the U.S. from PBDEs (polybrominated diphenylethers), phthalates, bisphenols, and PFAS are on the order of \$400 billion annually; \$66.7 billion (\$64.7 billion-67.3 billion) was due to phthalate exposure, while \$22.4 billion was due to PFAS exposure.⁵³

Health care and research institutions with resolutions on synthetic turf:

⁵² Lauer, N, Vegh, T, Nowlin, M et al (July 2025). ‘*The Social Cost of Plastic to the United States.*’ Duke University, Nicholas Institute for Energy, Environment & Sustainability.
<https://nicholasinstitute.duke.edu/sites/default/files/publications/the-social-cost-of-plastic-united-states.pdf>

⁵³ Trasande, L, Krithivasan, R, Park, K et al (Feb 2024). “*Chemicals Used in Plastic Materials: An Estimate of the Attributable Disease Burden and Costs in the United States.*” *Journal of the Endocrine Society*: (8), 2.
<https://doi.org/10.1210/edso/bvad163>

- **The California Medical Association**⁵⁴
- Santa Clara County Medical Association⁵⁵
- Children's Environmental Health Center, Mt. Sinai Hospital, New York City⁵⁶
- Physicians for Social Responsibility⁵⁷
- Climate Code Blue (Physician activists)⁵⁸
- The Consortium for Children's Environmental Health⁵⁹
- The Silent Spring Institute⁶⁰
- Lowell Center for Sustainable Production, Univ. of Mass., Lowell⁶¹

The Los Angeles Unified School District is transitioning away from synthetic turf in elementary and middle schools, and replacements and installations at high schools are on hold. Sacramento City Unified School District is considering the same. The National PTA will be voting on a resolution on synthetic turf in June 2026.

Mental Health Benefits of TRUE Green Space:

The lack of open true green, not fake green spaces, negatively impacts academic success, mental health, and violence. Natural green spaces have been shown to mitigate aggressive

⁵⁴ California Medical Association. (16 Aug 2024). Resolution 101-24: Removing Artificial Turf in Schools, Parks and Public Spaces.

⁵⁵ Santa Clara County Medical Association (24 Jun 2024). "Policy Recommendation on the Use of Artificial Turf on Landscapes, Schools and Playing Fields."

⁵⁶ Evans, SF, Harari, H (25 May 2025). "Position Statement on the Use of Artificial Turf Surfaces." The Children's Environmental Health Center, Mt. Sinai Hospital, New York, New York.
<https://mountsinaiaexposomics.org/position-statement-on-the-use-of-artificial-turf-surfaces/>

⁵⁷ Physicians for Social Responsibility

⁵⁸ Climate Code Blue: Physician Activists

⁵⁹ The Consortium for Children's Environmental Health

⁶⁰ Silent Spring Institute (Sep 2024). Public comment letter submitted to DTSC, Candidate Chemicals in Synthetic Turf, document id 9644.
<https://calsafer.dtsc.ca.gov/workflows/Comment/15588/?from=search>

⁶¹ Pollard, L, Massey, R (Aug 2024). "Per- and Poly-fluoroalkyl Substances (PFAS) in Artificial Turf: Academic, municipal, and other testing efforts." Lowell Center for Sustainability, University of Massachusetts, Lowell.
https://www.uml.edu/docs/PFAS%20in%20Artificial%20Turf%20-%20Academic%20Municipal%20%26%20Other%20Tests%20Aug%202024_tcm18-386957.pdf

behavior in adolescents⁶² and significantly reduce the growing risk of psychiatric disorders,⁶³ and suicide mortality.⁶⁴ Natural green spaces also reduce health risks such as asthma.⁶⁵

The American Psychological Association finds:⁶⁶

“...exposure to nature has been linked to a host of benefits, including improved attention, lower stress, better mood, reduced risk of psychiatric disorders and even upticks in empathy and cooperation.”

Initially published in Center for Climate, Health, and the Global Environment, Harvard:⁶⁷
“Studies have found that students who attend schools with green spaces tend to have better grades, higher test scores, and better attendance rates than those who do not.”



⁶² Younan, D., Tuvblad, C., Lianfa, L. et al (2016). *“Environmental Determinants of Aggression in Adolescents: Role of Urban Neighborhood Greenspace.”* J Am Acad Child Adolesc Psychiatry; 55(7):591–601.
<https://pubmed.ncbi.nlm.nih.gov/27343886/>

⁶³ Engeman, K., Pedersen, C.B., Arge, L., Svenning, J.C. et al (2019). *“Residential green space in childhood is associated with lower risk of psychiatric disorders from adolescence into adulthood.”* Proceedings of the National Academy of Sciences (PNAS.org) of the United States of America
<https://www.pnas.org/doi/10.1073/pnas.1807504116>

⁶⁴ Asri, AK, Tsai, HJ, Wong, PY et al (4 Jul 2022). *“Examining the Benefits of Greenness on Reducing Suicide Mortality Rate: A Global Ecological Study.”* Front. Public Health, Sec. Environmental Health and Exposome;;(10)902480.
<https://doi.org/10.3389/fpubh.2022.902480>

⁶⁵ Dong, Y, Liu, H, Zheng, T (13 Jan 2021). *The Impacts of Green Space Structure on Asthma in Toronto, Canada.* Med. Sci. Forum; 4(1), 6.
<https://doi.org/10.3390/ECERPH-3-09123>

⁶⁶ Weir, K. (2020). *Nurtured by nature: Psychological research is advancing our understanding of how time in nature can improve our mental health and sharpen our cognition.* American Psychological Association.
<https://www.apa.org/monitor/2020/04/nurtured-nature>

⁶⁷ Bowning, M, Rigolon, A (1 Feb 2019). *“School Green Space and Its Impact on Academic Performance: A Systematic Literature Review.”* Int J Environ Res Public Health;16(3):429.
<https://pmc.ncbi.nlm.nih.gov/articles/PMC6388261/>

Injuries:

Independent peer-reviewed research consistently shows significantly increased non-contact lower extremity injuries⁶⁸ and concussions^{69,52} particularly for children⁵² playing on synthetic turf is a contributing factor.

- 315,000 to 850,000 concussions every year occur among high school athletes.
- Repeated concussions increase risk of Chronic Traumatic Encephalopathy (CTE)/
- The Concussion Legacy Foundation reported that repetitive brain trauma is associated with CTE and has been found in 17 year olds. 41.4% of athletes under age 30 show signs of CTE.⁷⁰
- In high school American football players, concussions occur when head impacts approach 95 g.
- For youth American football players aged 9-14; 62.4 ± 29.7 g was the threshold for concussions.
- Research published Jan 2024 showed significantly greater impact deceleration on synthetic turf compared to natural grass surfaces, showing greater potential for concussions on synthetic fields.⁷¹

In a study of 953 student athlete injuries published in 2021, 61% occurred on synthetic, while 39% were on natural grass. The injuries included torso, and upper and lower limb injuries, and included football, girls and boys soccer and rugby teams, in descending order of the number of injuries reported.⁷²

In a meta analysis published in the American Journal of Sports Medicine, a comprehensive review of 53 studies that focused on injuries on artificial turf vs. natural grass fields. The systematic review of articles found that among non-contact injuries:

⁶⁸ Gould, HP, Lostetter, SJ, Samuelson, ER, Guyton, GP (May 2023). "Lower Extremity Injury Rates on Artificial Turf Versus Natural Grass Playing Surfaces: A Systematic Review." Am J Sports Me; 51(6): 1615-1621.
[doi: 10.1177/03635465211069562](https://doi.org/10.1177/03635465211069562)

⁶⁹ The Concussion Legacy Foundation. (2015). White Paper: The Role of Synthetic Turf in Concussion.

⁷⁰ Ober, M (28 Aug 2023). 41% of Young Athletes Show Signs of CTE. Neuroscience News.
<https://neurosciencenews.com/cte-young-athletes-23847/>

⁷¹ Villanueva, N, Chun, I, Fujiwara, A et al (Jan 2024). "Impact Deceleration Differences on Natural Grass Versus Synthetic Turf High School Football Fields." Hawaii Journal of Health; 82 (1) 4-10.
http://hawaiijournalhealth.org/past_issues/HJHSW_Jan24.pdf

⁷² Paliobeis, A, Sivasundaran, L, Knapik, D et al (Jul/Aug 2021). "Injury incidence is higher on artificial turf compared with natural grass in high school athletes: a retrospective cohort study." Current Orthopaedic Practice 32(4):p 355-360,
https://journals.lww.com/c-orthopaedicpractice/Abstract/2021/07000/Injury_incidence_is_higher_on_artificial_turf.6.aspx

“...[the] greatest proportion of articles reported a higher foot and ankle injury rate on artificial turf compared with natural grass, both with old-generation and new-generation turf. Similar knee and hip injury rates were reported between playing surfaces for soccer athletes on new-generation turf, but football players, particularly those at high levels of competition, were more likely to sustain a knee injury on artificial turf than on natural grass.”

The authors noted that **the few studies suggesting a higher rate of injury on natural grass “received financial support from the artificial turf industry.”**⁴³

Exposure to Methicillin-resistant *Staphylococcus aureus* (MRSA)⁷³ and other bacteria⁷⁴ are a potentially life threatening consequence of dermal abrasions, known as turf burns, due to friction on synthetic turf. Inhalation and ingestion are additional exposure pathways.

Synthetic turf exploits natural resources, from cradle to grave, polluting air, water and soil throughout its predicted 1,000 years it takes to fully degrade.⁷⁵ From fracking of fossil fuels, to the manufacturing of pre-production plastic pellets (nurdles) in ethane cracker plants, to manufacturing of the plastic carpet, transport, use, and interim and final disposal, environmental and social justice communities are the most impacted.⁷⁶

California based agencies and research organizations concerned with microplastics and synthetic turf for its contamination of our waterways and the ocean:

- California Ocean Protection Council⁷⁷

⁷³ US EPA (6 Aug 2019). “U.S. Federal Research Action Plan (FRAP) on Recycled Tire Crumb Rubber Used on Synthetic Turf Playing Fields and Playgrounds. Final Report Part 1 – Tire Crumb Characterization EPA Tools and Resources Webinar.”
https://www.epa.gov/sites/default/files/2019-08/documents/tc_public_webinar_-_august_6_2019.pdf slide 20

⁷⁴ Valeriani, F, Margarucci, LM, Gianfranceschi, G et al. (Aug 2019). “Artificial-turf surfaces for sport and recreational activities: microbiota analysis and 16S sequencing signature of synthetic vs natural soccer fields.” *Heliyon*; 5(8): e02334.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6728760/>

⁷⁵ Chamas, A, Moon, H, Zheng, J (3 Feb 2020). “Degradation Rates of Plastics in the Environment.” *ACS Sustainable Chemistry & Engineering*; (8)9.b
<https://pubs.acs.org/doi/10.1021/acssuschemeng.9b06635>

⁷⁶ Staff writer (25 Jan 2024). “US: Louisiana’s ‘Cancer Alley’ Dire Health Crisis From Government Failure to Rein in Fossil Fuels.” *Human Rights Watch*
<https://www.hrw.org/news/2024/01/25/us-louisianas-cancer-alley>

⁷⁷ [California Ocean Protection Council Statewide Microplastics Strategy](#)

- San Francisco Estuary Institute⁷⁸
- Heal the Bay⁷⁹
- National Resource Defense Council⁶
- LA Waterkeeper⁶
- Sierra Club⁸⁰
- Surfrider Foundation⁸¹
- California Coastal Commission^{82,83}

Socioeconomic and Equity Issues:

Indigenous, Black, Latinx, and other minority groups, tend to live in communities that have long been impacted by pollution, climate change, open green space, canopy tree cover,⁸⁴ and cooling centers. These communities bear a higher burden of health-related issues, decreased access to health care and to information due to cultural and language barriers, and often feel left out of the decision-making process.⁸⁵

Environmental and social justice (EJ/SJ) communities have higher exposures to toxic chemicals in air, water, and soil.^{86,87} They are more likely to be located near oil wells and refineries,

⁷⁸ SFEI. 2024. *The Pulse of the Bay: Contaminants of Emerging Concern*. SFEI Contribution #1219. San Francisco Estuary Institute. Richmond, CA.

⁷⁹ Heal the Bay. NRDC. LA Waterkeeper. letter to LA Council File 24-0602 2024

⁸⁰ <https://www.sierraclub.org/san-francisco-bay/marin/synthetic-turf>

⁸¹ <https://www.surfrider.org/news/artificial-turf-why-we-shouldnt-choose-plastic-over-plants>

⁸² https://www.califaep.org/docs/CEQA_Handbook_2025combined.pdf

⁸³ [CA Coastal Commissioners comments on synthetic turf. synthetic turf. microplastics](#)

⁸⁴ Leland, J (20 Aug 2021). *“Why an East Harlem Street Is 31 Degrees Hotter Than Central Park West If you want to map inequality in New York, you can just count trees.”* New York Times. https://www.nytimes.com/2021/08/20/nyregion/climate-inequality-nyc.html?unlocked_article_code=1.eE8.JFJV.A60qNvjU75HA&smid=url-share

⁸⁵ Together for Justice (n.d.). *“10 Examples Of Environmental Social Justice Issues.”* <https://togetherforsocialjustice.com/environmental-social-justice-issues/>

⁸⁶ Shaw-Wakeman, T, Cunliffe, Z (2024). *“The Life of Plastic: Black Women are Overexposed & Underprotected.”* Black Women for Wellness, Los Angeles. <https://bwwla.org/the-life-of-plastic-black-women-are-overexposed-underprotected/>

⁸⁷ Terrell, KA, St Julien, G (13 Jan 2022). *“Air pollution is linked to higher cancer rates among black or impoverished communities in Louisiana.”* Environmental Research Letters; 17, (1). <https://iopscience.iop.org/article/10.1088/1748-9326/ac4360>

underground gas storage tanks and pipelines,⁸⁸ landfills,⁸⁹ recycling facilities, SuperFund,⁹⁰ and polluting manufacturing sites.

Inequities in outdoor greenspace experienced in environmental and social justice communities cannot be corrected with the use of artificial turf playing fields or playgrounds. Impervious surfacing decreases the amount of green space, adds to the heat island effect, exposes vulnerable populations to toxic chemicals, adds to pollution of water via increased runoff; to the air via off gassing of greenhouse gasses; to the soil via removal of topsoil, compaction, and overheating; to all via microplastic pollution.

Open green spaces and gardens around homes, workplaces and schools provide places to relax, gather socially, and recreate.

Loss of open green space impacts mental health via increased heat, and lack of air conditioning, and poor air quality. It increases attention, empathy, cooperation, lowers stress, improves mood, and has been shown to reduce psychiatric disorders.⁹¹ Green schools have the potential to improve attendance, grades and test scores.^{92,93} Higher levels of green spaces decrease aggression in adolescents.⁹⁴ These benefits cannot be replicated in overheated, densely populated, fake green environments.

⁸⁸ Department of Public Health. (24 Aug 2024). "Community Health Profiles." County of Los Angeles. <https://apps.gis.lacounty.gov/static/DPH/chp-reports/CHP%20Report%20-%20County%20of%20Los%20Angeles%20-%20Environmental%20Justice.pdf>

⁸⁹ Lewis, R (22 Aug 2023). "Toxic trash: California's aging hazardous waste sites have troubling safety records." CalMatters. <https://calmatters.org/environment/2023/08/california-hazardous-waste-sites-permit-2/>

⁹⁰ Johnson, M, West, C (27 Apr 2024). "EPA Superfund Sites and Poor Health in Los Angeles County An assessment of community health in a 5 mile proximity to Superfund sites in relation to health insurance. ArcGIS Story Maps. <https://storymaps.arcgis.com/stories/75978b4e605e42aa98c05c83acd7bd56>

⁹¹ Weir, K. (2020). "Nurtured by nature: Psychological research is advancing our understanding of how time in nature can improve our mental health and sharpen our cognition. American Psychological Association." American Psychological Association. <https://www.apa.org/monitor/2020/04/nurtured-nature>

⁹² Hodson, CB, Sander, HA (Apr 2017). "Green urban landscapes and school-level academic performance." Landscape and Urban Planning; 160, 16-27 <https://doi.org/10.1016/j.landurbplan.2016.11.011>

⁹³ Kuo, M, Klein, SE, Browning, M, Zaplatosch, J (Feb 2020). "Greening for academic achievement: Prioritizing what to plant and where." Landscape and Urban Planning; 206, 103962 <https://doi.org/10.1016/j.landurbplan.2020.103962>

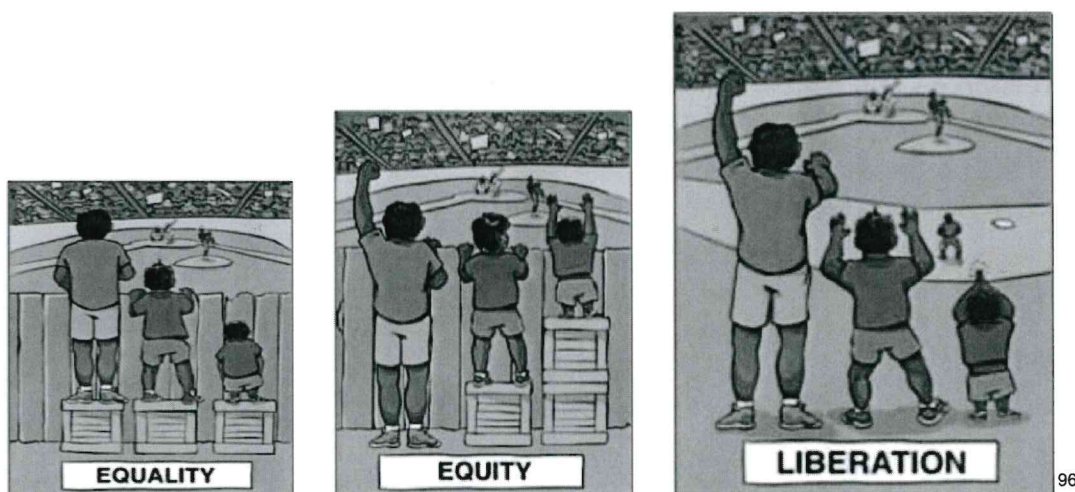
⁹⁴ Kuo, F. E., & Sullivan, W. C. (2001a). Aggression and violence in the inner city, effects of environment via mental fatigue. Environment and Behavior, 33, 543–571. <https://doi.org/10.1177/00139160121973124>

Equity in sports does not mean equality, either.⁹⁵ Equality is providing the same resources to everyone, while equity is providing resources based on need. When public playing fields are privatized, whether by a formal lease, maintenance agreement, or joint use agreement, barriers are created that widen the equity gap, creating a “pay for play” scenario, in which low income residents may be left out.

Suggestions to improve equity in sports:

- Removing fences
- Ensuring residents have more access to parks and playing fields than organized teams from other cities
- Offering scholarships or reduced fees based on income

Lastly, equity does not mean exposing vulnerable populations to more impervious surfacing, creating more heat islands, adding more pollution and toxic chemical exposure to students, coaches, staff, visitors, all park goers...for years to come.



Everyone DESERVES natural grass fields!

⁹⁵ Woods, M (2016). “Equality, equity and the role of fairness in inclusive sport.” Inclusive Sports Design. <https://www.inclusivesportdesign.com:equality-equity-and-the-role-of-fairness-in-inclusive-sport>

⁹⁶ Woods, M (2016). “Equality, equity and the role of fairness in inclusive sport.” Inclusive Sports Design. <https://www.inclusivesportdesign.com:equality-equity-and-the-role-of-fairness-in-inclusive-sport>

Not Recyclable; Not Sustainable:

Less than 6% of plastics are recycled.⁹⁷ Made of highly variable formulations of mixed plastics, synthetic turf is not recyclable, not sustainable and is a linear, not a circular product. Synthetic turf does not meet any definition of sustainability. The synthetic turf industry misrepresents its products when they make claims related to sustainability and environmental friendliness. It is not enough to use the vernacular of the day.

Circular products⁹⁸ are “...*those products that have reduced or completely no need for virgin resources and are designed with the end of their life in mind.*”

The United Nations defines sustainable development⁹⁹ as “...*development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*”

The UCLA Sustainability Committee¹⁰⁰ notes: “*In simplest terms, sustainability is about our children and our grandchildren, and the world we will leave them.*”

The Rutgers Center for Sustainable Materials¹⁰¹ definition:

*“Sustainable materials are materials used throughout our consumer and industrial economy that can be produced in required volumes **without depleting non-renewable resources and without disrupting the established steady-state equilibrium of the environment and key natural resource systems.**”*

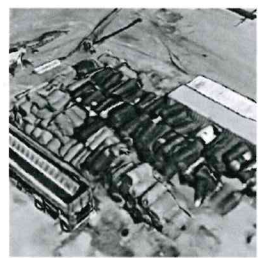
⁹⁷ Dell, J, Enck, J (May 2022). “*The Real Truth about the US Plastic Recycling Rate.*” Beyond Plastics. https://static1.squarespace.com/static/5eda91260bbb7e7a4bf528d8/t/62b2238152acae761414d698/1655841666913/The-Real-Truth-about-the-US-Plastic-Recycling-Rate-2021-Facts-and-Figures-_5-4-22.pdf

⁹⁸ “*What is a circular product?*” Circular Tayside, United Kingdom. <https://circulartayside.co.uk/what-is-a-circular-product-and-business-model/>

⁹⁹ United Nations (2024). “*Sustainable Development Agenda: What is sustainable development?*” <https://www.un.org/sustainabledevelopment/development-agenda/#1b1981a30bdd8fde2>

¹⁰⁰ UCLA Sustainability Committee, quoting UN World Commission on Environment and Development <https://www.sustain.ucla.edu/what-is-sustainability/>

¹⁰¹ Rutgers University. “*What are Sustainable Materials?*” Department of Materials Science and Engineering, Center for Sustainable Materials. Accessed 26 Jan 2025. <https://mse.rutgers.edu/center-sustainable-materials>



Not Recyclable



Thousands of rolls discarded on agricultural land in a watershed.



Mountains of used tire crumb infill

Impervious Surfacing:

The synthetic turf industry is making false claims, and issuing worthless certificates, claiming PFAS free, permeability, and more. This company is owned by a board member, and immediate past chair of the Synthetic Turf Council, and linked to the West Coast Vice President of TenCate Grass.

CERTIFICATE OF COMPLIANCE

firefly
sports testing

Firefly Sports Testing
78 Londonderry Tpk, Unit D5
Hooksett, NH 03106

Certificate Number: 2025-100344-01A

Applicant
Sprinturf
146 Fairchild St, Suite 150
Daniel Island, SC 29492

Manufacturer
Sprinturf
146 Fairchild St, Suite 150
Daniel Island, SC 29492

Product
46oz DFE Field Green

Model Number
D532241/T543046

Test Standard
EPA 1633

Test Report Number
100344-01

Test Date
3/19/2025

Validation Agency
Firefly Sports Testing
78 Londonderry Tpk, Unit D5
Hooksett, NH 03106

Validation Date
4/25/2025

Firefly Sports Testing certifies that the sample(s) identified in this certificate have been tested in accordance with the method(s) and specification(s) listed herein. The submitted sample(s) were evaluated under the conditions stated in the associated test report. Testing conducted in accordance with EPA Method 1633 detected no PFAS compounds above the method's reporting limits. This certificate applies only to the specific sample(s) tested and the conditions at the time of testing.

Approved By

Jeff Gentile
Co-Founder & CFO

CERTIFIED
TO
EPA 1633

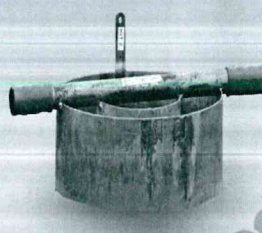


Tel: 603-715-5453 Website: www.fireflysportstesting.com

instagram.com

INFILTRATION

Equipment	Single or Double Ring Infiltrometer	Double Ring Infiltrometer	Non-Confined Area Flood Test Apparatus
Applicable Standards	EN 12516	ASTM D3385	ASTM F2898



Curious about what we test and why it matters? We're breaking it down—one test at a time. This week: Infiltration. It measures how quickly water drains through a surface—critical for keeping fields playable, safe, and in good condition after rain. Good drainage helps prevent puddles, infill migration, and game delays. Let's talk testing!

#TestingTuesday
#LetsTalkTesting
#TestedByFirefly
#TestOfTheWeek
#SurfaceTesting
#fireflysportstesting
#sports
#innovation
#technology
#production
#infrastructure

June 10, 2025

Add a comment...

202464217669

STATE OF CALIFORNIA
Office of the Secretary of State
REGISTRATION
OUT-OF-STATE LIMITED LIABILITY COMPANY

California Secretary of State
1500 11th Street
Sacramento, California 95814
(916) 657-5448

For Office Use Only
-FILED-
File No.: 202464217669
Date Filed: 10/18/2024

83126-3343 10/18/2024 11:16 AM Received by California Secretary of State

Limited Liability Company Name	FIREFLY ATHLETICS, LLC
Limited Liability Company Name	FIREFLY ATHLETICS, LLC
Jurisdiction	NEW HAMPSHIRE
Limited Liability Company is Formed in	NEW HAMPSHIRE
Authority Statement	This LLC currently has powers and privileges to conduct business in the state, foreign country or other jurisdiction entered above.
Street Address of Principal Office of LLC	78 LONDONDERRY TURNPIKE UNIT D5 HOOKSETT, NH 03106
Mailing Address of LLC	78 LONDONDERRY TURNPIKE UNIT D5 HOOKSETT, NH 03106
Mailing Address	78 LONDONDERRY TURNPIKE UNIT D5 HOOKSETT, NH 03106
Attention	Rachel Dupont
Street Address of California Office of LLC	None
Street Address of California Office	None
Agent for Service of Process	David Digeronimo 30934 CURRAN CT VALLEY CENTER, CA 92082
Agent Name	David Digeronimo
Agent Address	30934 CURRAN CT VALLEY CENTER, CA 92082
Consent to Service of Process	The Secretary of State is appointed as the agent of the foreign (out-of-state) limited liability company for service of process if the agent has resigned and has not been replaced or if the agent cannot be found or served with the exercise of reasonable diligence.

Despite industry claims, synthetic turf is classified as **impervious** by both the US EPA and the State of California. US EPA has defined impervious surfaces:

*“...areas such as gravel roads...that will be compacted through design or use to reduce their impermeability.” It further has defined impervious surfaces as...[a]ny surface that prevents or significantly impedes the infiltration of water into the underlying soil. This can include but is not limited to: roads, driveways, parking areas and other areas created using non porous material; buildings, rooftops, structures, **artificial turf** and compacted gravel or soil.”*

Compaction, as well as the impervious plastic surface, result in increased runoff. Despite synthetic turf industry claims, laboratory testing is not the same as reality. Synthetic turf is unable to handle the amount of rain that comes with an atmospheric river or bomb cyclone.

“Pollutants from aerial and terrestrial sources accumulate on impervious surfaces until runoff from a precipitation event carries sediment, nutrients, metals, and pesticides into stormwater drains and directly to local waterbodies. As impervious surfaces increase, stormwater runoff increases in quantity, speed, temperature, and pollutant load. When impervious surfaces reach 10–20% of local watershed area, surface runoff doubles and continues to increase until, at 100% impervious surface coverage, runoff is five times that of a forested watershed. Excessive stormwater runoff also increases the potential for flooding.” US EPA Impervious Surface Fact Sheet

The resulting impact on climate change from plastics and microplastics,¹⁰² including those from synthetic turf, are contributing factors to increased flood risk, toxic runoff,¹⁰³ and landslides.¹⁰⁴ **Synthetic turf creates 27,000 gallons of toxic runoff for every one inch of rain for every one acre of plastic installed.**¹⁰⁵

In addition to being an impervious surface, installation of synthetic turf often requires removal of trees, or contributes to their deaths by impeding water infiltration, thereby adding to the risk of

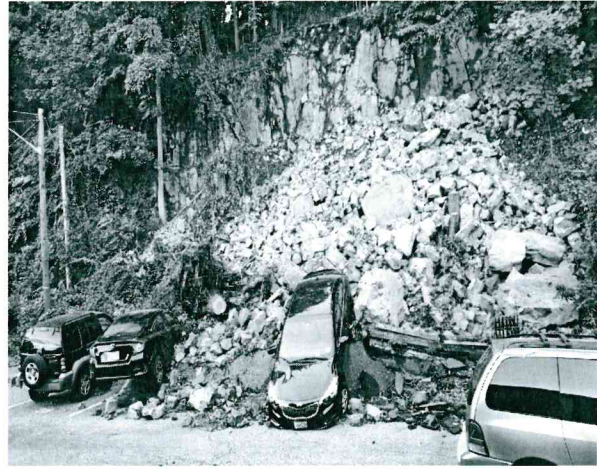
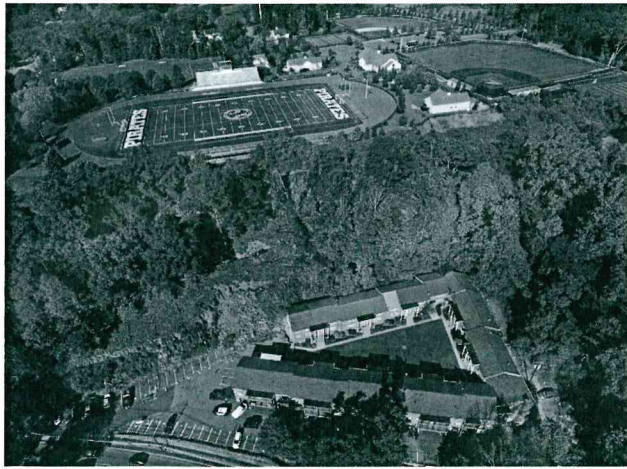
¹⁰² Sunil, S, Bhagwat, G, Vincent, SGT, Palanisami, T (10 Oct 2024). “Microplastics and climate change: the global impacts of a tiny driver.” Science of The Total Environment; (946),174160.
<https://www.sciencedirect.com/science/article/abs/pii/S0048969724043080>

¹⁰³ Simpson, TJ, Francis, RA (Aug 2021). “Artificial lawns exhibit increased runoff and decreased water retention compared to living lawns following controlled rainfall experiments.” Urban Forestry & Urban Greening; (63), 127232
<https://www.sciencedirect.com/science/article/abs/pii/S1618866721002570>

¹⁰⁴ Vogt, E (26 Oct 2021). “NJ prep school’s turf field blamed for rockslide that displaced 45 families.” NJ 1015. (link next page?)
<https://nj1015.com/nj-prep-schools-turf-field-blamed-for-rockslide-that-displaced-45-families/>

¹⁰⁵ Cotrone, V (undated). “The Role of Trees and Forests in Healthy Watersheds: Managing stormwater, reducing flooding, and improving water quality.” Penn State Extension.
<https://extension.psu.edu/the-role-of-trees-and-forests-in-healthy-watersheds>

landslides. Landslides are also a significant concern post wildfire events¹⁰⁶ and are a significant concern in all cases where there are no requirements or limitations on impervious surfacing.¹⁰⁷



Loss of Biodiversity:

- Soil - Synthetic turf impairs the microbiology and functions of soil by covering it with an impervious surface, disrupting carbon sequestration, photosynthesis, decomposition, and nutrient cycles. The resulting effect on organic exchanges impairs gas exchange, moisture uptake, the microbial population, and biochemical properties of the soil, leading to unhealthy soil, impaired plant growth, and eventual death.¹⁰⁸ A healthy microbial system is essential to soil health and fertility.^{109,110,111}

¹⁰⁶ United States Geological Survey Program (2018). "The scientific background information for Emergency Assessment of Postfire Debris-Flow Hazards."

<https://www.usgs.gov/programs/landslide-hazards/science/scientific-background>

¹⁰⁷ Strunsky, S (25 Oct 2021). "400-Year-Old N.J. Forest Cut Down for Fake Turf Field May Be to Blame for Rock Slide After Ida." NJ.com.

<https://www.nj.com/news/2021/10/400-year-old-nj-forest-cut-down-for-fake-turf-field-may-be-to-blame-for-rock-slide-after-ida.html?outputType=amp>

¹⁰⁸ Millard, B (22 Jul 2025). "Artificial Turf Literature Review. Consolidating Understandings around the Environmental and Ecological Implications of Artificial Turf Systems." SeaBin Foundation, Australia.

<https://seabinfoundation.org/artificial-turf-literature-review/>

¹⁰⁹ Hartmann, M, Frey, B, Mayer, J et al (31 Oct 2014). "Distinct soil microbial diversity under long-term organic and conventional farming." ISME J; 9, 1177–1194.

<https://doi.org/10.1038/ismej.2014.210>

¹¹⁰ Lindsey, AJ. Schiavon, M, Unruh, JB, Kenworthy, K (7 Jan 2025). "Urban Landscapes: Turfgrass Benefits." Department of Environmental Horticulture, University of Florida, Grasses;4(1), 3,

<https://doi.org/10.3390/grasses4010003>

¹¹¹ Arachchige, PSP, Hettiarachchi, GM, Rice, CW et al (Sep/Oct 2024). "Direct evidence on the impact of organic amendments on carbon stabilization in soil microaggregates." Soil Society of America J; 88(5),1529-1544.

<https://doi.org/10.1002/saj2.20701>

- Trees - Synthetic turf negatively impacts living plants through multiple mechanisms. Installation of artificial turf requires compaction of soil, which reduces root growth by reducing aeration. Because it is impervious, it does not allow adequate watering or rainfall into the soil. Toxic runoff from the plastic surfacing may allow waterlogging of plantings in low lying areas, even when not immediately surrounded by the carpeting. The chemicals in the plastic and runoff can be toxic to the roots of living plants. The extreme heat created by the artificial turf greatly reduces or kills the soil biome integral to healthy soil with nutrients needed for growth, and prevents carbon sequestration into the soil, and oxygen production. These factors can ultimately result in living plant and tree deaths.
- Synthetic turf poses a significant global threat to wildlife and aquatic organisms via ingestion of microplastics and toxic chemical leachate, threatening our food chain.¹¹² It is estimated that >1500 species have ingested microplastics,¹¹³ including high levels in air exhaled by dolphins via their blowholes.¹¹⁴ Artificial turf in urban parks was found to reduce house sparrow populations by 60%.^{115,116}
- Microplastics have been found in birds' lungs,¹¹⁷ and in the abdomens of fledgling puffins on remote islands in high volumes leading to death.¹¹⁸

¹¹² Wiseman, L (8 Apr 2026). "Artificial Grass and Its Impact." World Wildlife Federation.
<https://www.wwf.org.uk/articles/artificial-grass-and-its-impact>

¹¹³ Santos, RG, Machovsky-Capuska, GE, Andrades, R (2021). "Plastic Ingestion as an Evolutionary Trap: Toward a Holistic Understanding." *Science*: 373, 56–60.
<https://pubmed.ncbi.nlm.nih.gov/34210877/>

¹¹⁴ Dziobak, MK, Fahlman, A, Wells, RS (16 Oct 2024). "First evidence of microplastic inhalation among free-ranging small cetaceans." *PlosOne*.
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0309377>

¹¹⁵ Ponce-Bernat, E, Gil-Delgado, JA, López, GM (20 Feb 2020). "Sharp decrease in sparrows caused by use of artificial grass in city parks." *Phys.org*
<https://phys.org/news/2020-02-sharp-decrease-sparrows-artificial-grass.pdf>

¹¹⁶ Sánchez-Sotomayor, D, Martín-Higuera, A, Gil-Delgado, JA (2023). "Artificial grass in parks as a potential new threat for urban bird communities." *Bird Conservation International*;33, e16, 1–8.
<https://doi.org/10.1017/S0959270922000119>

¹¹⁷ Tokunaga, Y, Okochi, H, Tani, Y et al (Apr 2023). "Airborne microplastics detected in the lungs of wild birds in Japan." *Chemosphere*; 321,138032.
<https://www.sciencedirect.com/science/article/pii/S0045653523002990>

¹¹⁸ Lavers, J, Bond, AL, Hutton, I (Apr 2024). "Plastic ingestion by Flesh-footed Shearwaters (*Puffinus carneipes*): Implications for fledgling body condition and the accumulation of plastic-derived chemicals." *Environmental Pollution*; (187)124-129.
<https://www.sciencedirect.com/science/article/abs/pii/S0269749113006532>

- It is estimated that roughly one million seabirds and 100,000 marine mammals are killed annually from plastic in our oceans. In its 2024 Report, the World Wildlife Fund reports a loss of 73% of wildlife populations in the period from 1970 to 2020.¹¹⁹
- Synthetic turf is implicated in increasing frequent red tides and toxic algal blooms.¹²⁰

Wildfire risk:

Synthetic turf is a combustible petrochemical product. Research in three countries has shown it is neither ember or flame resistant.^{121,122,123}

“Glowing embers, as are commonly blown in front of an advancing bushfire, have a temperature of around 700-800°C, and the flame of a burning leaf has a temperature of around 700°C. Strips of polyethylene can be ignited with the flame of a match which has a temperature of around 700°C.”¹²⁴ “Over the past two decades, we saw a 250 percent increase in fire speed across the West that I don’t see slowing down anytime soon.” Fire ecologist, Jennifer Balch.¹²⁵

¹¹⁹ World Wildlife Federation (2024). *“Living Planet Report: 2024. Nature is Disappearing: The Average Size of Wildlife Populations Has Fallen By a Staggering 73%.”*
<https://livingplanet.panda.org/en-US/>

¹²⁰ Ren, X, Mao, M, Feng, M et al (1 Mar 2024). *“Fate, abundance and ecological risks of microcystins in aquatic environment: The implication of microplastics.”* Water Research; Volume 251, 121121.
<https://www.sciencedirect.com/science/article/abs/pii/S0043135424000228>

¹²¹ Kukfisz, B (2018). *“The Degree of Flammability for an Artificial Grass Surface System.”* The Main School of Fire Service, Faculty of Fire Safety Engineering, Warsaw, Poland.
<https://doi.org/10.1051/e3sconf/20184500038>

¹²² Horticulture Innovation Australia Limited (Apr 2020). *“Living Turf Fire Benefits Study - Literature review.”* GHD Australia.
<https://www.horticulture.com.au/globalassets/hort-innovation/resource-assets/tu17008-literature-review-living-turf-fire-benefits-study.pdf>

¹²³ Paturol, A (2021). *“Fire performance of artificial turf structures : small-scale testing and development of fireproofing strategies.”* Material chemistry. Université de Lille, France. Doctoral thesis.
https://theses.hal.science/tel-03561379v1/file/These_PATUROL_Angeline.pdf

¹²⁴ Horticulture Innovation Australia Limited (Apr 2020). *“Living Turf Fire Benefits Study - Literature review.”* GHD Australia.
<https://www.horticulture.com.au/globalassets/hort-innovation/resource-assets/tu17008-literature-review-living-turf-fire-benefits-study.pdf>

¹²⁵ Deng, J (11 Jan 2025). *“The Dichotomy of a Deadly Paradise—How Urban Sprawl and Climate Change Fuel LA’s Fires.”* Inside Climate News.
<https://insideclimatenews.org/news/11012025/los-angeles-wildfires-in-altadena-and-pacific-palisades/>



Pacific Palisades 2/2025



Concord, CA 2025¹²⁶



Alta Dena 2/2025



A fire caused significant damage to a newly-installed football field at Mt. Diablo High School in Concord and police say fireworks may be to blame.

¹²⁶ New TenCate Pivot plastic turf filed destroyed by fire

Synthetic turf increases toxic exposures during wildfires.^{127,128} And, it contributes to escalating insurance costs.^{129,130,131}

Not CEQA Exempt!

In December of 2023, the California Coastal Commission disallowed the University of California Santa Barbara from installing synthetic turf at the Caesar Uyesaka Stadium, citing microplastics, concerns related to water contamination and lack of conformity with the University's sustainability policies.¹³² It has not allowed synthetic turf in the Coastal Permit Zone since 2023.¹³³

"[Artificial turf] cannot be considered the environmentally superior alternative..." and cited microplastics as a primary concern. The Coastal Commission also noted that "Section 21080.5(d)(2)(A) of CEQA prohibits the Commission from approving a proposed development if there are feasible alternatives or feasible mitigation measures available that would substantially lessen any significant adverse effect which the activity may have on the environment."²

The Commission also disallowed removal of trees.

CEQA guidelines were recently updated, changing the section analogous to the one quoted by the Coastal Commission to § 21002. APPROVAL OF PROJECTS; FEASIBLE ALTERNATIVE OR MITIGATION MEASURES, though the wording and intent of the law remains unchanged.¹³⁴

¹²⁷ Schlanger, Z (15 Jan 2025). "What Happens When a Plastic City Burns." The Atlantic. <https://www.theatlantic.com/science/archive/2025/01/los-angeles-fire-smoke-plastic-toxic/681318/>

¹²⁸ Staff writer (17 Jan 2025). "Plastic Chemicals in Wildfire Smoke and How to Protect Yourself." Plastic Soup Coalition. <https://www.plasticpollutioncoalition.org/blog/2025/1/17/plastic-chemicals-in-wildfire-smoke-and-how-to-protect-yourself>

¹²⁹ Mandel, A, Battiston, S, Monasterolo, I. (5 Feb 2025). "Mapping global financial risks under climate change. Nature, Climate Change. <https://doi.org/10.1038/s41558-025-02244-x>

¹³⁰ Sherriff, L (18 Mar 2024). "Climate change is fuelling the US insurance problem." British Broadcasting Corp. <https://www.bbc.com/future/article/20240311-why-climate-change-is-making-the-us-uninsurable>

¹³¹ Capani, C (7 May 2024). "Aviva issues flood risk warning as residents turn to artificial lawns." Insurance Times; United Kingdom. <https://www.insurancetimes.co.uk/news/aviva-issues-flood-risk-warning-as-residents-turn-to-artificial-lawns/1451833.article>

¹³² [Notice of Impending Development UCS-NOID-0002-23 \(Baseball Stadium Turf\) for Public Hearing and \[California Coastal\] Commission Action at the December 13, 2022](#)

¹³³ [CA Coastal Commissioners comments on synthetic turf. microplastics](#)

¹³⁴ https://www.califaep.org/docs/CEQA_Handbook_2025combined.pdf

The city council, board of supervisors, and board of education members should be acutely aware that in any decision regarding synthetic turf or other projects, that YOU are the lead agency regarding all documentation related to CEQA. If staff or consultants intentionally/unintentionally mislead you regarding CEQA requirements, that falls you, not the staff nor consultants. This includes any claims or filings related to NOEs (Notice of Exemption) or MNDs (Mitigated Negative Declaration). Additionally, be aware that claims that a project was approved by the Division of State Architect (DSA) and meets CEQA requirements is also untrue. The DSA is limited to reviewing school construction projects for building code compliance and structural safety. They play no role in CEQA, and have no authority to approve any projects under CEQA.

Additionally, the Governor's Office on Land Use and Climate Innovations, together with the Department of Natural Resources now oversees CEQA. They are acutely aware of the urgency of plastics in our environment, and the circumvention of the CEQA process by many local jurisdictions, as is the California Coastal Commission.

Playable Hours Myth:

The industry and staff who support plastic turf more often than not skew the hours of play. Beware that more hours of play also means more exposure to toxic chemicals, more risk for non-communicable diseases and cancer, more rapid breakdown of the plastic, more expense for more frequent landfilling and replacement, and more legal liability exposure.

Comparisons related to number of hours of play may be skewed significantly as they are most often based on the number of hours reserved for a given playing field, and not on the actual hours of play.

"Hours of play as reported is based on permits, not actual on the ground play time. This is critical because synt[hetic]turf is fenced, locked and often not used even during permitted time blocks, and not outside of those times. The [natural] grass fields, in contrast, see almost constant play during, and outside of permitted time, because they are typically NOT fenced and locked. So, if a team cancels practice or a game during permitted time on grass, others will certainly see it is empty and play on it anyway."

Dr. Kathy Michaels, NIH researcher, ret., Board Member, Safe Healthy Playing Fields, Inc; public testimony, Montgomery County, Maryland, 2025.

This was also prominently elucidated as early as a 2014 article in a Forbes Magazine, revealing how proponents of artificial turf manipulate information.¹³⁵ This dynamic was most recently affirmed last year in a letter submitted to CA DTSC by the University of Massachusetts Lowell Center for Sustainable Production, regarding DTSC's background document on Candidate

¹³⁵ Ozanian, M (2014). "How Taxpayers Get Fooled On The Cost Of An Artificial Turf Field." Forbes Magazine.
<https://www.forbes.com/sites/mikeozanian/2014/09/28/how-taxpayers-get-fooled-on-the-cost-of-an-artificial-turf-field/>

Chemicals in Artificial Turf. Dr. Rachel Massey noted:

*“Regarding play times, we have documented examples of sustainably managed grass athletic fields that meet the play hours needed by communities. Grass athletic field consultants explain that with proper maintenance, a grass field will accommodate as much play as needed. We have also encountered instances in which artificial turf vendors assign different “weights” to different activities. For example, one hour of a heavy activity such as football may be counted as more than one hour of use. It can be important to understand these weightings when assessing the expected life span and cost effectiveness of the product.”*¹³⁶

Student athletes are not elite athletes. Pushing them to perform in extreme heat with a WBGT up to 92°F the inland desert region (CIF Category 3),¹³⁷ is inviting preventable heat illness, heat stroke and death...as well as the high risk for legal liability.

- OF NOTE:
Synthetic turf is not “set it and forget it.” It is high maintenance...if you wish to preserve warranties.
- It is not 24/7 play. High play = faster replacement.
- Synthetic turf requires toxic chemicals for cleaning and weed abatement.
- Synthetic turf requires vast amounts of POTABLE water to clean and cool the surface to a playable temperature, and repeatedly throughout play.

Decision Making Criteria	Regenerative/Organic Maintenance	Conventional Grass	Synthetic Turf
20 Year Total Cost	\$180k - \$390k	\$210k - \$410k	\$1.35M - \$2.0M +
Maintenance costs / Year	\$1500 - \$4500 / acre	\$4,000 - \$6,000 / acre	\$10k - 15k / field
Hours of maintenance / Year	75 - 100	250	350
Playable Hours	1500 - 3630 ¹	650 - 800*	2,000 - 2,500**
Water Use	40 to 60% less Bermuda hybrids	Moderate - High	High Potable water required Cleaning; cooling; hydration of plant based infills
Water Contamination	None; no synthetic inputs; is not a “product swap”	Mod to High Synthetic fertilizer, Pesticide use	High toxic leachate with rainfall, cleaning, hydration

PLAYABLE HOURS

“Several manufacturers were contacted and asked to verify this statistic. As of the writing of this report, no response has been received. Likely, it is an estimate based on the assumption that artificial turf can withstand round-the-clock play and would be played on for almost the entirety of the year over 8 hours a day.”

* Unverified claims made by synthetic turf industry.
** All monitoring and maintenance systems show playable hours ~30% of claims made; closures for heat and particulate matter are not playable hours.

https://www.veronanj.org/media/Sustainable%20Verona/2024/Centennial%20Field%20-%20Turk%20Study/Verona%202024%20Final%20Report_.pdf

¹³⁶ Massey, R (30 Sep 2024). “Comments on California DTSC’s Background Document on Candidate Chemicals in Artificial Turf.” Lowell Center for Sustainable Production, Univ. of Mass., Lowell. [LCSP letter to DTSC](#)

¹³⁷ [CIF Extreme Heat Policy](#)

Hidden costs: what is staff not telling you?

The hidden “extras” with artificial turf projects:

- Environmental Impact Reports; CEQA filings and directed requirements.
- Irrigation systems. *Failure to clean plastic fields can void warranties and put athletes at risk. Necessary to cool the surface to playable temperature.
- Drainage/catchment systems (made of plastics, contributing to unrecyclable plastics, microplastic pollution)
- Annual GMax testing- ~\$1,515. More frequently if it fails testing.
- Annual infill replenishment- 1.5 to 5 tons of chosen infill *plant-based infill is generally 4.5 times more expensive than used tire crumb.
- New maintenance equipment.
- Maintenance agreement costs (required by some manufacturers).
- Increased POTABLE water to cool plastic surface to playable temperature.
- Cleaning solvent. *Failure to follow maintenance requirements will nullify warranties.
- Pesticides for weed eruption (Some manufacturers call for glyphosate, Spectracide).
- Removal costs.
- Transportation and disposal costs (potential for disposal in hazardous waste landfills).
- POTABLE Water to clean synthetic fields of bacteria,^{138,139} secretion of human fluids, waste left by pets and wildlife; often a requirement to maintain warranty. Failure to clean causes build up of bacteria, which is more prevalent in older synthetic surfaces.^{140,141}
- Increased legal liability.

Alternatives Exist:

Avoidance of microplastics, toxic chemical exposure to people and planet, reduction of greenhouse gasses, and plastic pollution, and in support of a cooler environment, improved human health,¹⁴² and biodiversity lies in nature-based solutions.

¹³⁸ US EPA (6 Aug 2019). “U.S. Federal Research Action Plan (FRAP) on Recycled Tire Crumb Rubber Used on Synthetic Turf Playing Fields and Playgrounds. Final Report Part 1 – Tire Crumb Characterization EPA Tools and Resources Webinar.” slide 20
https://www.epa.gov/sites/default/files/2019-08/documents/tc_public_webinar_-_august_6_2019.pdf

¹³⁹ Valeriani, F, Margarucci, LM, Gianfranceschi, G et al (28 Aug 2019). *Artificial-turf surfaces for sport and recreational activities: microbiota analysis and 16S sequencing signature of synthetic vs natural soccer fields.* Heliyon: Heliyon 5 (2019) e02334.
<https://doi.org/10.1016/j.heliyon.2019.e02334>

¹⁴⁰ Bass, JJ, Hintz, DW (2013). “Determination of Microbial Populations in a Synthetic Turf System,” Skyline - The Big Sky Undergraduate Journal: 1(1), Article 1.
<https://scispace.com/pdf/determination-of-microbial-populations-in-a-synthetic-turf-1jfau95sd7.pdf>

¹⁴¹ Keller, M, Turco, RF, Gray, MB, Sigler, V (2020). “The Fate of Methicillin-Resistant *Staphylococcus aureus* in a Synthetic Turf System.” Sports Health: 12(3), 263-270.
<https://pmc.ncbi.nlm.nih.gov/articles/PMC7222665/>

¹⁴² Braun, RC, Mandai, P, Nwachukwu, E, Stanton, A (17 Oct 2024). “The role of turfgrasses in environmental protection and their benefits to humans: Thirty years later.” Crop Science; (64)2, pp2909-3618.

Natural grass actively sequesters carbon dioxide and provides a cooling function that is especially dramatic when compared to the heat generated by synthetic turf. Grass naturally filters toxins, performs important eco-services for the soil beneath, and provides widely dispersed rainwater infiltration allowing absorption and recharging of the water table. Additionally:¹⁴³ Research suggests that:

- Natural grasses can accumulate and deposit carbon into the soil by approximately one-half ton of carbon per acre per year for 30 to 40 years.
- 5,000 square feet of natural grass lawns can provide enough oxygen for approximately 28 residents - something sorely needed in our overbuilt environment.¹⁴⁴
- Desert and drought tolerant Bermuda hybrid grasses can save water.
- **Regenerative / organic management, and zero emission maintenance equipment mitigate greenhouse gas emissions, reduce costs over time, and increase carbon sequestration.**¹⁴⁵

Newer drought and desert tolerant Bermuda grass hybrids have been developed for high use playing fields, and can also be used in residential and commercial properties. One such natural grass hybrid, Tahoma31,¹⁴⁶ uses 60% less water and can stay green for six weeks, potentially reducing water usage to two to three waterings per summer. It has sterile seeds and is non-invasive. Other drought tolerant varieties, grown in the Coachella and Fernando Valleys, Ramona, as well as Stockton and other locations, include Coachella, Bandera, Legion and other Bermuda hybrids.

Development of college credit courses in regenerative / organic turf management would provide an opportunity to showcase the state mandated K-12 Core Curriculum on Climate Change, and allow students to transition to colleges and universities as a path to high paid green jobs for the future. This would also provide an opportunity to meet state requirements for composting organic waste,^{147,148} which can be used in regenerative/organic field maintenance. This has the added benefit composting locally, saving money, reducing the carbon footprint associated with transportation rather than shipping green waste to more remote locations.

<https://doi.org/10.1002/csc2.21383>

¹⁴³ The Lawn Institute. "Carbon Sequestration." Accessed 2 Feb 2025.
<https://www.thelawninstitute.org/environmental-benefits/carbon-sequestration/>

¹⁴⁴ The Lawn Institute. "Fresh Oxygen Production by Natural Grass Lawns in the United States."
https://www.thelawninstitute.org/wp-content/uploads/2021/02/TLI-FreshO2production_US-Final.pdf

¹⁴⁵ [Beyond Pesticides, organic management cost comparison](#)

¹⁴⁶ [Tahoma31 Project List](#)

¹⁴⁷ [SB 279](#)

¹⁴⁸ [SB1383](#)

Beyond Pesticides offers a two year program that includes reviewing expenditures, soil testing, training staff in organic natural turf management, and two years of monitoring progress. They do not do installations or maintenance.¹⁴⁹

With both synthetic turf and microplastics coming under regulation by the California Department of Toxic Substances Control, and grants moving to nature based solutions, it is time to GET REAL with natural grass and other nature based solutions!

Respectfully submitted,

Diana Conway, President
Dianne Woelke MSN, Board Member
Safe Healthy Playing Fields, Inc.
<https://www.safehealthyplayingfields.org>
SHPFI is an all-volunteer nonprofit 501-c-3



¹⁴⁹ Beyond Pesticides Sustainable Parks Program



El Césped Sintético



El césped sintético es un producto plástico petroquímico elaborado principalmente a partir de polietileno, el plástico más producido y desechado a nivel mundial. Otras resinas utilizadas pueden incluir polipropileno y uretano.

Las PFAS son una clase de más de 16 000 sustancias químicas, conocidas como “sustancias químicas eternas”. Se añaden durante la fabricación de césped sintético para evitar que los hilos plásticos se peguen a la maquinaria. Se han encontrado en el 100% de todos los materiales de césped sintético analizados.

Las PFAS son una clase de más de 16 000 sustancias químicas, conocidas como “sustancias químicas eternas”. Se añaden intencionalmente durante la fabricación de césped sintético para evitar que los hilos plásticos se peguen a la maquinaria. Se han encontrado en el 100% de todos los materiales de césped sintético analizados.

Otros químicos utilizados en la fabricación incluyen plastificantes, retardantes de llama, colorantes, estabilizadores UV, biocidas, estabilizadores térmicos, antioxidantes, lubricantes y agentes espumantes, catalizadores, ftalatos y sustancias perfluoroalquilo (PFAS).

Las investigaciones indican que las PFAS pueden causar una disminución de la fertilidad, daños al desarrollo, al hígado, a la tiroides y a otros órganos, alterar la respuesta a las vacunas y causar cáncer. Se bioacumulan en los seres

humanos, la vida salvaje y acuática y persisten a lo largo de generaciones.

Los PFAS se filtran del césped sintético al aire, el agua y la tierra a medida que se exponen al medio ambiente y debido a la acción abrasiva del juego.

El césped sintético es un material impermeable que alcanza fácilmente temperaturas de 160°F a 180°F y más. Sobrecalienta la tierra, mata el bioma vivo debajo y aumenta la escorrentía tóxica y cancerígena.



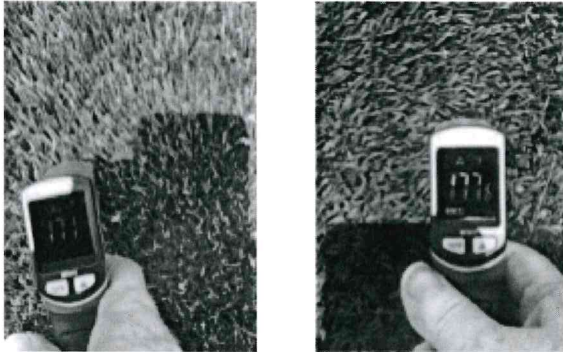
La emisión de gases de metano y etileno, dos potentes gases de efecto invernadero, crea islas de calor más grandes que la huella de un campo de juego sintético, lo que afecta el área circundante y contribuye al cambio climático.

Las quemaduras en el césped por fricción, las quemaduras térmicas, las heridas sin contacto en las extremidades inferiores y las conmociones cerebrales ocurren con más frecuencia en campos de césped sintético que en campos de césped natural.

Los atletas se ven cada vez más afectados por enfermedades de estrés térmico debido al jugar en superficies sintéticas. Las muertes por insolación se duplicaron entre 2015 y 2017 en comparación con los cinco años anteriores. Futbolistas tienen once veces más probabilidades de sufrir enfermedades relacionadas con el calor jugando en césped sintético.



El césped sintético requiere más agua que las variedades Bermudas tolerantes a la sequía para reducir la temperatura de la superficie a un nivel comparable al del césped natural para un juego seguro. El enfriamiento requiere aproximadamente 12 mil galones de agua y dura unos 20 minutos.



El césped sintético requiere aproximadamente 989 galones de agua para producir 1 metro cuadrado de césped, lo que se estima equivale a regar un metro cuadrado de césped natural durante 18 años. También se necesita agua para limpiar la contaminación, los fluidos corporales, los desechos animales, moho, bacterias y más del plástico.

El césped sintético es un plástico mixto y no se puede reciclar. Hasta la fecha, no se ha reciclado ningún campo de juego sintético para convertirlo en campo. El reciclaje de productos químicos avanzados altamente contaminantes no es una alternativa viable y plantea riesgos para la salud de los trabajadores y las comunidades circundantes. Se estima que la retirada, el transporte y el vertido actuales ascienden \$64k a \$100k dólares. Muchos vertederos no aceptarán este material peligroso. Con frecuencia se tira ilegalmente y continúa contaminando el medio ambiente durante los más de mil años que se tarda en descomponerse.



©Feb 2026

La contaminación por microplásticos proveniente de campos sintéticos representa una amenaza adicional para la contaminación de la tierra, el aire y el agua, así como para el daño ambiental. Cada año, 2,000 a 3,000 libras de hojas rotas de plástico migran de cada campo de tamaño reglamentario-hasta 16x mas si es del tipo que no ocupa relleno agregado. Pierda de 1 a 5 toneladas de contaminación adicional se escapa de un campo en forma de relleno agregado encima de un campo sintético para soportar las hojas de plástico y proporcionar amortiguación.



A un precio aproximadamente 4.3 veces mayor que el del césped natural correctamente instalado y mantenido, el césped sintético es una mala inversión. Los campos de césped natural de última generación pueden durar 30 años y su mantenimiento es menos costoso si se gestionan de forma orgánica. El uso de agua es menor con variedades tolerantes a la sequía y el equipo de mantenimiento de cero emisiones mitiga las emisiones de gases de efecto. En cambio, el césped sintético cuesta en promedio de \$1.2 millones para instalarlo, requiere agua, equipo de mantenimiento especializado a gas o diésel, uso de herbicidas para reducir el crecimiento de malezas y moho, reemplazo anual del relleno, pruebas de dureza y posibles demandas judiciales por heridas.

Para obtener más información:

safehealthyplayingfields.org

<https://www.endocrine.org/topics/edc/plastics-edcs-andhealth>

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0200574>
<https://www.ewg.org/newsinsights/news/2023/02/wildlife-warning-more-330species-contaminated-forever-chemicals>

<https://www.theguardian.com/society/2021/mar/28/shanna-a-swan-fertility-reproduction-count-down>

<https://pubmed.ncbi.nlm.nih.gov/37392868/>

Synthetic Turf



Synthetic turf is a petrochemical plastic product most often made from polyethylene, the most highly produced and discarded plastic globally. Other resins used may include polypropylene and urethane.

Other chemicals used in manufacturing include plasticizers, flame retardants, colorants, UV stabilizers, biocides, heat stabilizers, antioxidants, lubricants, and foaming agents, catalysts, phthalates and per- and polyfluoroalkyl substances (PFAS).

PFAS are a class of over 16,000 “forever” chemicals. All can bioaccumulate in our bodies and the environment. They can persist for hundreds to thousands of years, and they threaten our food supply. PFAS has been found in all synthetic turf tested by independent and academic laboratories using proper methods and techniques.

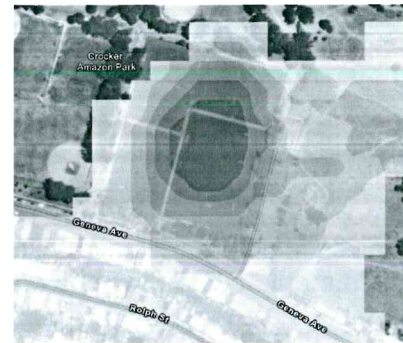
Research indicates PFAS can cause decreased fertility, developmental, liver, thyroid, and other organ damage, impair vaccine response and cause cancers. They bioaccumulate in humans, wild and aquatic life and persist across generations. PFAS



leach from synthetic turf into air, water and soil as it is exposed to the environment and due to grinding action from play.

Synthetic turf is an impervious material that readily reaches temperatures of 160°F-180°F and beyond. It over heats the earth, kills the living biome beneath and adds to toxic and carcinogenic runoff.

Off gassing of methane and ethylene, 2 powerful greenhouse gasses, creates heat islands larger than the footprint of a synthetic playing field, impacting the surrounding area and contribute to climate change.



Turf burns from friction, thermal burns, non-contact lower extremity injuries and concussions all occur more frequently on synthetic turf than on natural grass fields.

Athletes are increasingly impacted by heat related illness playing on synthetic surfaces. Deaths from heat stroke doubled from 2015 to 2017 when compared to the 5 preceding years. Football players are eleven times more likely to suffer a heat related illness playing on synthetic turf.

Synthetic turf requires more water than drought tolerant Bermuda varieties in order to bring the surface temperature down to a level comparable to natural grass for safe play. The cooling requires approximately 12 thousand gallons of water and lasts for some 20 minutes.



Synthetic turf requires approximately 989 gallons of water to produce 1 square meter of turf- estimated to be the equivalent of watering a square meter of natural grass for 18 years. For a regulation sized field (80 thousand square feet), 7,353,160 gallons would be required; Water for cleaning pollution, bodily fluids, animal waste, mold, bacteria and more from plastic turf, often a condition of warranty, is also needed.

Synthetic turf is a mixed plastic and not amenable to recycling. To date, no synthetic playing field has been recycled into a field. Highly polluting advanced chemical recycling is not a viable alternative and poses health risks to workers and surrounding communities. Current removal, transport and landfilling is estimated to be \$64k to \$148k. Many landfills will not accept this hazardous material. It is frequently illegally disposed of and continues to contaminate the environment for the estimated 450+ years it takes to decompose.

Microplastic pollution from synthetic fields poses additional threat to soil, air and water pollution as well as environmental harm. Each year, 2 to 3 thousandpounds of broken blades migrate of each regulation sized (80k square foot) field. One to five tons of additional pollution is walked off a field in the form of the infill added on top of a synthetic field to support the plastic blades and provide cushioning.



At a cost of approximately 4.3 times greater than properly installed and maintained natural grass fields, synthetic turf is a poor investment. State of the art natural grass fields can last 30 years and are less expensive to maintain over time if organically managed. Water use is lower with drought tolerant varieties and zero emission maintenance equipment mitigates green house gas emissions. Synthetic turf, by contrast has a warranty of 8 to 10 years, costs on average \$1.2 million to install, required water, specialized gas or diesel maintenance equipment, herbicide use to abate weed and mold growth, annual infill replacement and hardness testing and potential lawsuits from injury.



For more information:
safehealthyplayingfields.org

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0200574>

<https://www.ewg.org/news-insights/news/2023/02/wildlife-warning-more-330-species-contaminated-forever-chemicals>

<https://www.theguardian.com/society/2021/mar/28/shanna-swain-fertility-reproduction-count-down>

<https://www.endocrine.org/topics/edc/plastics-edcs-and-health>



© March 2026

Iraheta, Alba

From: Gao, Beilei
Sent: Tuesday, June 23, 2026 3:53 PM
To: Iraheta, Alba
Subject: Fw: MSC meeting June 23, 2026
Attachments: Doc1.docx

From: Suzanne York
Sent: Tuesday, 23 June 2026 15:44:47
To: Gao, Beilei <bgao@cityofpasadena.net>
Subject: MSC meeting June 23, 2026

[] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you know the content is safe. Report phish using the Phish Alert Button (PAB). For more information about the PAB view article "KB0011474" on the DoIT portal.

**To: Councilmembers Rick Cole, Justin Jones, Tyron Hampton, and Jason Lyon
Pasadena Municipal Services Committee**

Subject: Please Reject Any Further Investment in Artificial Turf Fields in Pasadena

Dear Councilmembers Cole, Jones, Hampton, and Lyon,

I am writing to urge you, in the strongest possible terms, to vote against any expenditure of public funds for artificial turf fields in Pasadena- whether described as a "new" installation or a "replacement" project. A replacement artificial turf field is, in reality, a new artificial turf field, and Pasadena should not be investing another dollar in a product that poses growing risks to public health, the environment, and taxpayers.

This decision should not be difficult.

The evidence against artificial turf continues to mount. Across the country, communities, school districts, environmental organizations, physicians, and public health advocates are raising serious concerns about the safety of synthetic fields. Emerging research suggests potential links between artificial turf materials and a variety of cancers, particularly endocrine-related cancers. While scientists continue to study the long-term impacts, the unanswered questions alone should give us pause. When the health of children is at stake, uncertainty should lead us toward caution-not toward further investment.

At the same time, the evidence regarding injuries is becoming increasingly difficult to ignore. Professional athletes have spoken out repeatedly about the dangers of artificial surfaces. Even the NFL Players Association has acknowledged significantly higher injury rates on synthetic turf compared with natural grass. Studies have found injury rates ranging from 54% to nearly 70% higher on artificial surfaces for certain types of injuries. If the most highly conditioned athletes in the world are being injured at greater rates on artificial turf, why would we knowingly place Pasadena's children on the same type of surface?

But the health concerns extend far beyond athletic injuries.

Artificial turf is fundamentally incompatible with Pasadena's environmental goals.

Our city has spent years developing climate action strategies, reducing urban heat, protecting public health, and building resilience. Yet artificial turf works directly against those objectives. Synthetic fields can reach temperatures far exceeding natural grass, often becoming dangerously hot during Southern California summers. They contribute significantly to the urban heat island effect by replacing living, cooling landscapes with petroleum-based plastic surfaces.

This concern is even more urgent today.

Our community is still recovering from the devastating impacts of the Eaton Fire. Residents are already experiencing increased heat vulnerability due to the loss of thousands of mature trees and

vegetation. We should be restoring natural cooling systems wherever possible- not installing large expanses of heat-absorbing plastic that make our neighborhoods hotter.

Artificial turf also sheds microplastics into our environment. Those particles do not disappear. They enter our soil, our waterways, our wildlife habitats, and ultimately our bodies. Every synthetic field becomes a long-term source of plastic pollution.

And when these fields reach the end of their useful life- typically within eight to ten years—they create another problem.

They cannot truly be recycled in any meaningful or large-scale way.

The vast majority of artificial turf fields end up in landfills. Thousands of pounds of plastic carpet, rubber infill, backing materials, and adhesives become waste that future generations must manage. We would be creating an environmental liability while claiming to pursue sustainability.

Even the financial argument for artificial turf fails under scrutiny.

Proponents often focus on reduced watering costs while ignoring the full lifecycle expenses. When replacement costs, disposal costs, maintenance costs, sanitation costs, repairs, grooming, cooling treatments, and eventual field replacement are included, synthetic turf frequently costs substantially more than natural grass over a ten-year period.

Taxpayers deserve an honest accounting.

And even if artificial turf and natural grass cost the same- **which they do not**- how could we possibly assign a dollar value to children's health, increased injury risks, hotter neighborhoods, plastic pollution, and environmental degradation?

Some have argued that natural grass fields are impractical because of lighting limitations or other site constraints. Mr. Panossian has cited lighting challenges as one reason synthetic surfaces are being considered.

Respectfully, inadequate lighting should not become an excuse for adopting a harmful solution.

If lighting is the issue, then let us address the lighting issue.

If drainage is the issue, let us improve drainage.

If field durability is the issue, let us explore modern turf-management practices, drought-tolerant grass species, regenerative soil practices, improved irrigation technologies, rotational field use, field-restoration programs, and natural surface innovations that communities across the country are already using successfully.

These are solvable challenges.

Pasadena has some of the brightest engineers, landscape architects, environmental professionals, parks experts, and community advocates in California. Surely we can design playing fields that are safe, sustainable, and fiscally responsible without covering our parks and schools in plastic.

The question before you is not whether we can afford natural solutions.

The question is whether we can afford the consequences of artificial ones.

Years from now, Pasadena residents may ask whether we knew the risks. Whether we understood the health concerns. Whether we were aware of the environmental costs. Whether we knew these products would become landfill waste. Whether we understood their contribution to heat and pollution.

Today, the answer is yes.

We do know.

And because we know, we have a responsibility to act accordingly.

Please reject any funding for artificial turf installations or replacements. Instead, direct staff to pursue natural grass fields and nature-based solutions that protect public health, support climate resilience, preserve environmental quality, and reflect Pasadena's values.

Our children deserve fields that nurture their health.

Our residents deserve neighborhoods that stay cooler.

Our taxpayers deserve investments that last.

And our environment deserves better than plastic.

I respectfully urge you to vote no.

Sincerely,

Suzanne York
Pasadena Resident
Environmental Advocate

McMillan, Acquanette (Netta)

From: Cynthia Cannady
Sent: Tuesday, June 23, 2026 4:20 PM
To: Gao, Beilei
Subject: No to marketing generalities when our children's health is at stake
Attachments: Artificial Turf research list.docx

[] **CAUTION:** This email was delivered from the Internet. Do not click links or open attachments unless you **know** the content is safe. Report phish using the Phish Alert Button (PAB). For more information about the PAB view article "KB0011474" on the DoIT portal.

My concern is the health and safety of the children who play on Pasadena's fields.

The claims of the Artificial Turf industry that new types of AT are safer and sustainable remind me of the old cigarette commercials that claimed that menthol was cool and better than unfiltered cigarettes like Camels.

For AF, the reality depends on what chemicals are in each layer of the artificial turf. I have written to City staff to ask for this specific information and what I received was clear as mud.

The staff memo seeks to reassure the community and the Council with vague statements about the infill being "natural" and "organic".

These terms are misleading. AF has 5-6 layers, not just infill. What about the plastic blades? **I encourage the Council to hold off on any decision until staff provides specifics to Council about the actual chemical ingredients in each layer of a proposed AF product.**

The global \$billion AF business knows it has a marketing problem. That's why it has filed lawsuits to intimidate scientists who were trying to provide the public with information about the health dangers. <https://www.nytimes.com/2025/06/17/climate/artificial-turf-grass-lawsuit-defamation-health-risk.html>

There have been many studies on the toxicity of artificial turf, especially on children, focussing on cancer, estrogen changes, and asthma and respiratory illness. Attached is a partial list of references.

Even if artificial turf were pure as the driven snow, AF intensifies the urban heat effect. Do we really want more heat and toxic air in our community?

It's not true that there are no alternatives. This community deserves good clean playing fields that don't expose children to health risks.

It's not true that AF is cheaper to maintain, as was made clear in the last MSC meeting.

I urge Council members to insist on specific information about the chemical components of any artificial turf product that staff proposes to purchase BEFORE making a decision. Reject the proposed carte blanche approach. Refuse the vague and misleading marketing approach and insist on facts.

The health of our children is at stake.

Cynthia Cannady
Resident District 6

Artificial Turf research list; Cynthia Cannady

- <https://www.bcpp.org/artificial-turf-hidden-health-risks-parents-should-know/>
- <https://www.usf.edu/health/public-health/news/2024/turf.aspx>

From the Silent Spring Institute on artificial turf and breast cancer.

- "Breast cancer is the most common cancer diagnosis in the United States^{1, 2} and rates of breast cancer in the US are increasing for all females, including in females too young to begin mammogram screening,^{2, 3} indicating the role of environmental exposures. Among people in the US under age 50, breast cancer incidence is 6 times more common than any type of cancer in males, and rates of death from breast cancer are more than double that of any other cancer in either sex.⁴ Given the enormity of this public health burden, it is critical to prevent exposures that may increase breast cancer risk. "

"We urge DTSC to strongly consider regulating artificial turf containing Candidate Chemicals as a Priority Product in order to protect California's vulnerable communities from unnecessary exposure to chemicals of health concern. **Exposures to chemicals from artificial turf is of particular concern to school-age children, and the alarmingly high rates of breast cancer in premenopausal people and those who are too young to begin cancer screening underscores the particular susceptibility of females to carcinogenic exposures.**" (emphasis added).

- Cal EPA, Dept of Toxic Substances, 2024: "Based on our evaluation, we are concerned about the potential for adverse impacts from exposure to Candidate Chemicals in artificial turf, which is a product frequently used by sensitive subpopulations, including young children." <https://dtsc.ca.gov/wp-content/uploads/sites/31/2024/07/Background-Document-on-Candidate-Chemicals-in-Artificial-Turf.pdf>
- New England Journal of Medicine, <https://www.nejm.org/doi/full/10.1056/NEJMms2409092>
- https://www.uml.edu/docs/PFAS%20in%20Artificial%20Turf%20-%20Academic%20Municipal%20%26%20Other%20Tests%20Aug%202024_tcm18-386957.pdf

McMillan, Acquanette (Netta)

From: Terry Saucier
Sent: Tuesday, June 23, 2026 4:21 PM
To: Gao, Beilei
Subject: Public Comment Special Meeting, June 23, 2026_Synthetic Turf - For the Public Record
Attachments: Public comments - Clty of Pasadena Special Meeting, June 23-Artificial Turf.pdf

You don't often get email from

[arn why this is important](#)

[] **CAUTION:** This email was delivered from the Internet. Do not click links or open attachments unless you **know** the content is safe. Report phish using the Phish Alert Button (PAB). For more information about the PAB view article "KB0011474" on the DoIT portal.

Dear Chair, Vice Chair, and Members of the MSC Committee:

It's Time to Ban Artificial turf installations - due to its harmful impacts on human health, the environment and wildlife - and to prioritize nature-based solutions.

I am writing to you on behalf of the SoCal Stop Artificial Turf Task Force. We are advocating with coalition partners for a ban on artificial turf installations across all applications due to its harmful impacts on human health, the environment and wildlife. The tonight's presentation as outlined in the agenda leaves out many details about artificial turf and its negative impacts including: it's toxicity to people, air, water, soil, it's too hot even on moderate days (coconut in-fill won't change that) leading to less playable hours, flammability, it's an impervious surface that prevents stormwater recharge, thereby increasing the likelihood of flooding, it contributes to climate change from cradle to grave, harms biodiversity, can't be recycled and will continue polluting the environment for 1,000s of years to come. Medical Associations are sounding the alarm, and other cities and states are transitioning away from synthetic turf across all applications and turning to nature-based solutions -California native plants and sustainably managed drought-tolerant grasses that use less water, thrive in our climate, recharge our groundwater, and can meet playable hours needed.

Our Coalition letter is [here](#), and attached is a general overview of primary concerns.

Thank you for your consideration.

Kind regards,
Terry Saucier
SoCal Stop Artificial Turf Task Force

For more information visit: https://www.ncsa.la/artificial_turf

June 23, 2026
City of Pasadena

Sent via email:

RE: **Special Meeting, June 23, 2026**
Public Comments – Synthetic Turf

Request: Recommend a ban on installations of synthetic turf across all applications

Dear Chair, Vice Chair, and Members of the MSC Committee:

The SoCal Stop Artificial Turf Task Force is part of a coalition of more than 60 organizations that are calling for a ban on artificial turf installations across all applications, due to its harmful impacts on human health, the environment and wildlife. We support nature-based solutions: California native plants and drought-tolerant grasses that use less water, thrive in our climate, recharge our groundwater, and provide food and habitat for local wildlife.

Science and real-world experience have proven that artificial turf does not live up to its promises. Primary concerns about artificial turf are:

Artificial turf is a fossil-fuel based petrochemical plastic that contributes to greenhouse gas emissions and climate change from cradle to grave. When accounting for artificial turf's impacts on local communities we also need to include its impact on the communities where the fossil fuels are extracted, the petro-chemicals and plastics are produced, and the product is discarded. According to a recent study the plastic industry releases about four times as many planet-warming chemicals as the airline industry.

Artificial turf is toxic. It contains toxic chemicals including PFAS “forever” chemicals, phthalates, flame retardants, and microplastics which are known carcinogens, neurotoxins, and hormone disruptors that can cause asthma, attention deficit disorders, low birth rate, early puberty, and are associated with a long list of cancers. PFAS microplastic exposure can occur through inhalation, ingestion, skin contact and mucous membrane exposure. Children and athletes are also at risk from the microplastic dust that is kicked up on artificial turf fields. PFAS chemicals bioaccumulate, and are therefore especially harmful to children and young adults who are still developing and may be exposed from an early age. Multiple medical associations have resolutions against using artificial turf, including the California Medical Association, Santa Clara County Medical Association, Children’s Environmental Health Center, Mt. Sinai Hospital, New York City; and Physicians for Social Responsibility. The California Department of Toxic Substance Control (DTSC) is bringing artificial turf under regulation due to PFAS and other toxic chemicals, and considering adding microplastics to the list of chemicals of concern.

Artificial turf pollutes air, water and soil. These chemicals not only harm those playing on it, but they can leach into the ground and drinking water. Recent EPA

findings indicate there is no safe amount of certain PFAS compounds in drinking water. Meanwhile, cities are finding PFAS in local wells, and will pay millions to filter out toxic contaminants and build infrastructure to increase locally sourced drinking water. Run-off from artificial turf also contaminates watersheds, rivers and oceans. Studies have found 12-15% of microplastics in waterways and oceans originate from synthetic turf's plastic blades. The California Coastal Commission hasn't allowed artificial turf in the California Coastal Commission permit zone since 2023 when it denied UC Santa Barbara's application for a 3-acre plastic baseball field – due to negative environmental impacts and the fact it isn't superior to natural grass or sustainable. San Francisco should follow suit and stop installing artificial turf to protect the ocean, marine wildlife and coastline communities.

Artificial turf gets too hot and is not a safer playing surface. A recent UC Irvine study identified extreme heat as the deadliest weather-related hazard, and found that surfaces like artificial turf, concrete, and rubber can reach temperatures hot enough to cause pain and burns. Artificial turf can be 80°F hotter than the air temperature and readily reach temperatures of 160-180°F or more, which can increase heat-related health injuries as well as create a heat island effect. Studies also show athletes who play on artificial turf are more likely to have lower extremity injuries and concussions, particularly in children. Turf burns from abrasions and exposure to MRSA and other bacteria are also more common. The UC Irvine study also highlighted the importance of natural green cooler spaces to counter extreme heat. This should also be a priority for San Francisco. To mitigate extreme heat, school districts like the Los Angeles Unified School District have artificial turf bans.

Artificial turf doesn't save water. More than 989 gallons of water are required to produce one square meter of plastic turf. The amount of water required to cool and clean artificial turf can be greater than that needed to maintain drought-tolerant native trees and plants, and according to artificial turf maintenance manuals, potable water is required. Additionally, artificial turf is an impervious surface, negatively impacting the recharging of groundwater and aquifers, while increasing the risk of flooding.

Artificial turf is combustible. It presents a serious fire hazard. According to a recent study by GHD Australia, when artificial turf is exposed to heat sources that more closely match real wildfire situations and temperatures, artificial turf is easily flammable. The melting and burning of artificial turf also release toxic gases including PFAS into the air, which can be inhaled by firefighters, other first responders, and residents. The study also found natural grass provides superior fire safety benefits compared to synthetic alternatives because it contains moisture that can help slow fire spread and does not release toxic fumes when heated.

Artificial turf cannot be recycled. It is made of mixed plastic materials and will never be economically viable for recycling. At the end of its 8-to-15-year lifecycle it is sent to a landfill, illegally dumped, or sent out of state for incineration/advanced recycling. It should be noted California is suing ExxonMobil for deceptive plastic recycling claims.

Nothing lives in plastic. California is one of the world's 36 biodiversity hotspots with more native plant species than any other state in the U.S. Not only does artificial turf not support life, it kills the soil microbes and living organisms beneath it, and takes away habitat from insects, birds, and local wildlife above, contributing to the loss of biodiversity.

Artificial turf regulations and bans already exist in CA – With the passing of Senator Ben Allen's bill SB676 some California cities have already implemented artificial turf bans including Carmel, Millbrae, San Marino (23.16.24), City of San Fernando, and others are considering pursuing regulations and bans including Los Angeles in CF 24-0602. LA's Climate Emergency Mobilization Office is recommending a moratorium on the installation of artificial turf until further studies are completed.

Cost comparisons - Studies show that over time artificial turf playing fields can cost two to four times more than properly installed and maintained grass fields. It is a poor investment. When comparing natural grass playing fields to artificial turf, it is important to compare the entire product life cycle including the capital cost of installation, annual maintenance, sod replacement as needed for natural fields, and surface/in-fill replacement of the synthetic fields, as well as disposal of artificial turf (removal, transport, and landfill fees).

Nature-based solutions are the answer. Artificial turf is NOT a safer playing surface, does not significantly reduce water usage, and is not a sound investment. Installing artificial turf does not take into account the true cost to our children's health and the health of our environment. The answer is nature-based solutions – California Native Plants and sustainably managed drought tolerant grasses that use less water, thrive in our climate, recharge our groundwater, and can meet playable hours needed.

Respectfully,
Terry Saucier
SoCal Stop Artificial Turf Task Force, Chair

From: cityclerk <cityclerk@cityofpasadena.net>
Sent: Tuesday, June 23, 2026 5:08 PM
To: Iraheta, Alba <airaheta@cityofpasadena.net>; Jomsky, Mark <mjomsky@cityofpasadena.net>; Robles, Sandra <sarobles@cityofpasadena.net>; Sabha, Tamer <tsabha@cityofpasadena.net>; McMillan, Acquanette (Netta) <nmcmillan@cityofpasadena.net>; Soo, Christine <csoo@cityofpasadena.net>
Subject: FW: Support for Maintaining Artificial Turf at Villa Parke Soccer Field

From: Chris Medina [REDACTED]
Sent: Tuesday, June 23, 2026 5:07:48 PM (UTC-08:00) Pacific Time (US & Canada)
To: Acevedo, Gloria <gacevedo@cityofpasadena.net>; Morales, Margo <mlmorales@cityofpasadena.net>; cityclerk <cityclerk@cityofpasadena.net>
Cc: Carcamo, Jorge <jcarcamo@cityofpasadena.net>; Bermudez, Marco <mbermudez@cityofpasadena.net>
Subject: Support for Maintaining Artificial Turf at Villa Parke Soccer Field

[A] **CAUTION:** This email was delivered from the Internet. Do not click links or open attachments unless you *know* the content is safe. Report phish using the Phish Alert Button (PAB). For more information about the PAB view article "KB0011474" on the DoIT portal.

Dear Members of the Municipal Services Committee,

I am writing to express my strong support for maintaining an artificial turf playing surface at Villa Parke Soccer Field and moving forward with the City's proposed next-generation turf replacement project.

As a local youth soccer coach, I spend countless hours at Villa Parke with players and families. From my perspective, this field is one of the most important recreational assets in Pasadena. It serves thousands of youth and adult participants every year and provides a safe, reliable, and accessible place for our community to gather, exercise, and compete.

The reality is that Villa Parke is not a lightly used neighborhood field. It is one of the most heavily utilized soccer facilities in the City. The current turf field allows year-round play and

supports a volume of programming that natural grass simply cannot sustain without significant closures, maintenance periods, and reductions in field availability.

Converting the field back to grass would create several challenges:

- Reduced access for youth sports programs due to field recovery and maintenance requirements.
- Increased cancellations and disruptions following heavy use or wet weather.
- Greater water consumption at a time when Southern California continues to prioritize conservation.
- Fewer available playing hours for families, schools, community organizations, and recreational leagues.
- Additional strain on an already limited inventory of athletic fields throughout Pasadena.

The City's own analysis recognizes that demand for athletic fields already exceeds available capacity and that many organizations are turned away each year due to limited field availability. Reducing playable hours at Villa Parke would only worsen this challenge.

I also appreciate that the proposed replacement turf system incorporates significant advancements over earlier generations, including PFAS-free manufacturing, recyclable components, improved drainage, and organic infill materials designed to reduce environmental concerns while maintaining playability and durability.

Most importantly, I ask that the Committee consider the impact on local children and families. For many young athletes, Villa Parke is where they learn teamwork, discipline, confidence, and community. The field is used daily and remains one of Pasadena's most active recreational spaces.

I respectfully urge the Committee to support the replacement of the existing field with the proposed next-generation artificial turf system and preserve the year-round access that so many Pasadena families rely upon.

Thank you for your time, service, and consideration.

Respectfully,

Chris Medina

Coach, Villa Parke Youth Soccer League

Coach, Rose City Strikers FC





Outlook

Fw: MSC Comment - Item #2 - Please Support a Municipal Moratorium on Plastic Fields

From Gao, Beilei <bgao@cityofpasadena.net>
Date Wed 6/24/2026 7:50 AM
To Tabakian, Talia <ttabakian@cityofpasadena.net>

From: Pilar Reynaldo
Sent: Tuesday, June 23, 2026 4:56 PM
To: Gao, Beilei <bgao@cityofpasadena.net>
Cc: Hampton, Tyron <thampton@cityofpasadena.net>; Cole, Rick <rcole@cityofpasadena.net>; Jones, Justin <jjones@cityofpasadena.net>; Lyon, Jason <jlyon@cityofpasadena.net>
Subject: MSC Comment - Item #2 - Please Support a Municipal Moratorium on Plastic Fields

[You don't often get email from <https://aka.ms/LearnAboutSenderIdentification>] Learn why this is important at

[△] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you know the content is safe. Report phish using the Phish Alert Button (PAB). For more information about the PAB view article "KB0011474" on the DoIT portal.

Dear Members of the Pasadena Municipal Services Committee,

I urge you to place a moratorium on the use of artificial turf fields in Pasadena parks and city facilities.

These "fake fields" routinely reach temperatures of 140–180°F on hot days – conditions that are becoming more common – posing serious risks of burns, heat exhaustion, and heat stroke, especially for children and athletes. In contrast, natural grass remains significantly cooler.

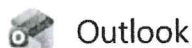
Artificial turf also sheds microplastics and can expose users to harmful chemicals from crumb rubber infill, including heavy metals and other toxic compounds. These materials then enter our stormwater system, environment, and waterways, contributing to long-term public health concerns. Since the state is not recycling plastic the turf will not be recyclable.

Unlike living grass, synthetic fields provide no environmental benefits. They do not cool the air, support biodiversity, or absorb stormwater, and may worsen flooding. They also create significant waste, as fields must be replaced every 8–10 years and are not recyclable.

Natural grass fields are the safer, cooler, and more future-proof choice for our community.

Sincerely,

[illegible]



Fw: MSC Comment - Item #2 - Please Support a Municipal Moratorium on Plastic Fields

From Gao, Beilei <bgao@cityofpasadena.net>
Date Wed 6/24/2026 7:51 AM
To Tabakian, Talia <ttabakian@cityofpasadena.net>

From: Wendy Silva >
Sent: Tuesday, June 23, 2026 9:48 PM
To: Gao, Beilei <bgao@cityofpasadena.net>
Cc: Hampton, Tyron <thampton@cityofpasadena.net>; Cole, Rick <rcole@cityofpasadena.net>; Jones, Justin <jjones@cityofpasadena.net>; Lyon, Jason <jlyon@cityofpasadena.net>
Subject: MSC Comment - Item #2 - Please Support a Municipal Moratorium on Plastic Fields

You don't often get email from . [Learn why this is important](#)

[A] CAUTION: This email was delivered from the Internet. Do not click links or open attachments unless you *know* the content is safe. Report phish using the Phish Alert Button (PAB). For more information about the PAB view article "KB0011474" on the DoIT portal.

Dear Members of the Pasadena Municipal Services Committee,

I urge you to place a moratorium on the use of artificial turf fields in Pasadena parks and city facilities.

These "fake fields" routinely reach temperatures of 140–180°F on hot days – conditions that are becoming more common – posing serious risks of burns, heat exhaustion, and heat stroke, especially for children and athletes. In contrast, natural grass remains significantly cooler.

Artificial turf also sheds microplastics and can expose users to harmful chemicals from crumb rubber infill, including heavy metals and other toxic compounds. These materials then enter our stormwater system, environment, and waterways, contributing to long-term public health concerns.

Unlike living grass, synthetic fields provide no environmental benefits. They do not cool the air, support biodiversity, or absorb stormwater, and may worsen flooding. They also create significant waste, as fields must be replaced every 8–10 years and are not recyclable.

Natural grass fields are the safer, cooler, and more future-proof choice for our community.

Sincerely,



WENDY G. SILVA

S I L V A V I L L A

3700 LA CRESCENCIA AVE #202 • GLENDALE, CA 91208
818 527-7644 | 818 530-7135 | SUVA-YVONIA.COM



 Book time to meet with me