

McMillan, Acquanette (Netta)

From: Lauren Siegel <
Sent: Friday, April 10, 2026 2:27 PM
To: Official Records - City Clerk
Cc: Jomsky, Mark; Airitam, Derrick
Subject: CIP Budget - Letters on Artificial Turf
Attachments: 2024-09-10 EAC Artificial Turf Memo to Council with Figure.pdf

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Good Afternoon,

I believe ALL the public comment letters to EAC, Parks and REC and MSC on artificial turf should be included in public comment regarding the CIP for City Council and Finance Committee. The Planning Commission didn't receive the letters, and I feel it impacted their vote. There were thirty letters sent to MSC, please attach these to the CIP comments and the EAC letter.

Thanks,
Lauren Siegel

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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:

