

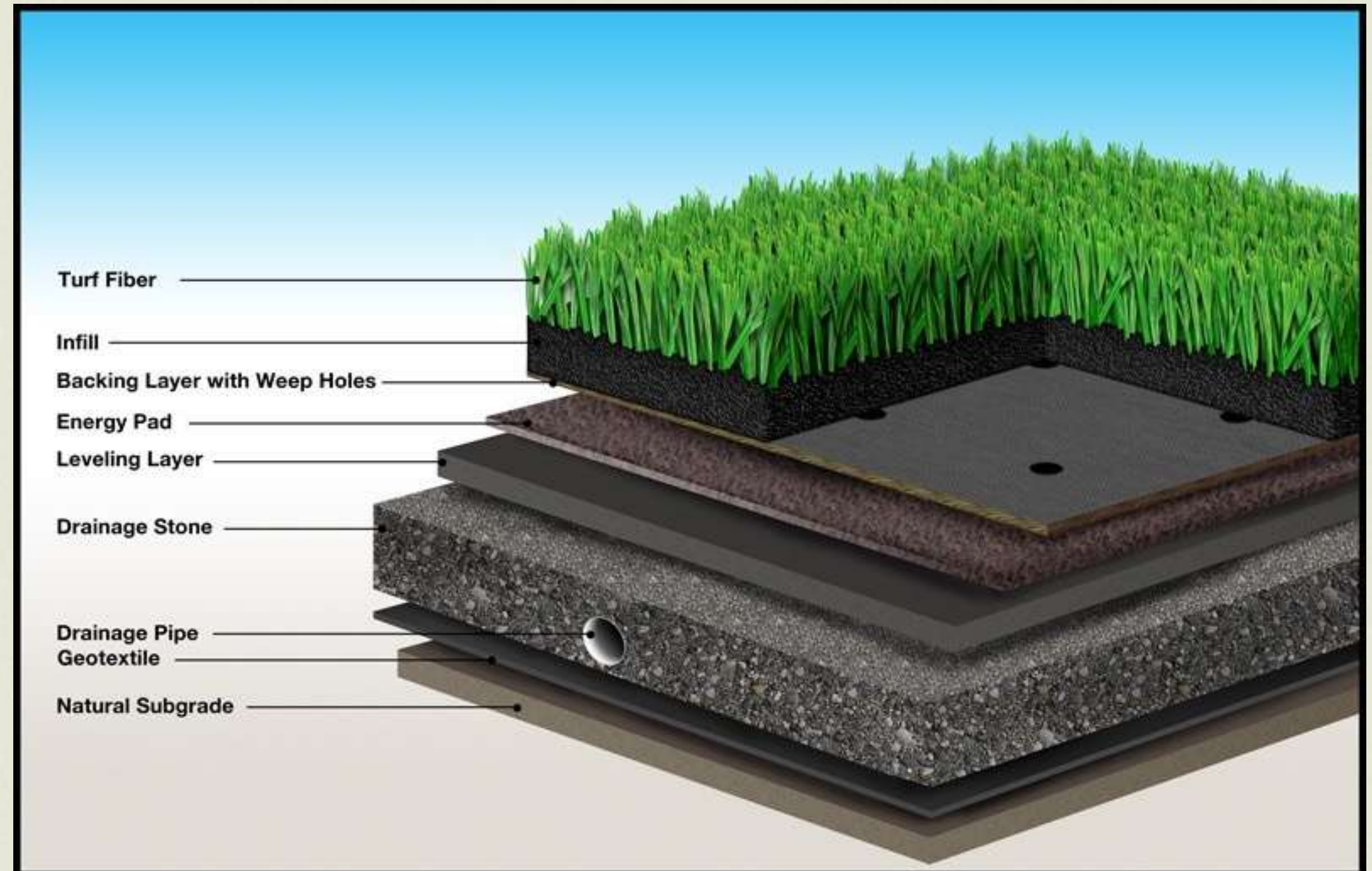
Artificial Turf

What is it?

Artificial turf is a synthetic surface designed to resemble grass, used in sports arenas, residential lawns, and commercial spaces.

The artificial turf blades are primarily made from plastic, specifically polyethylene. A common infill used is crumb rubber, made from recycled tires.

What is it?



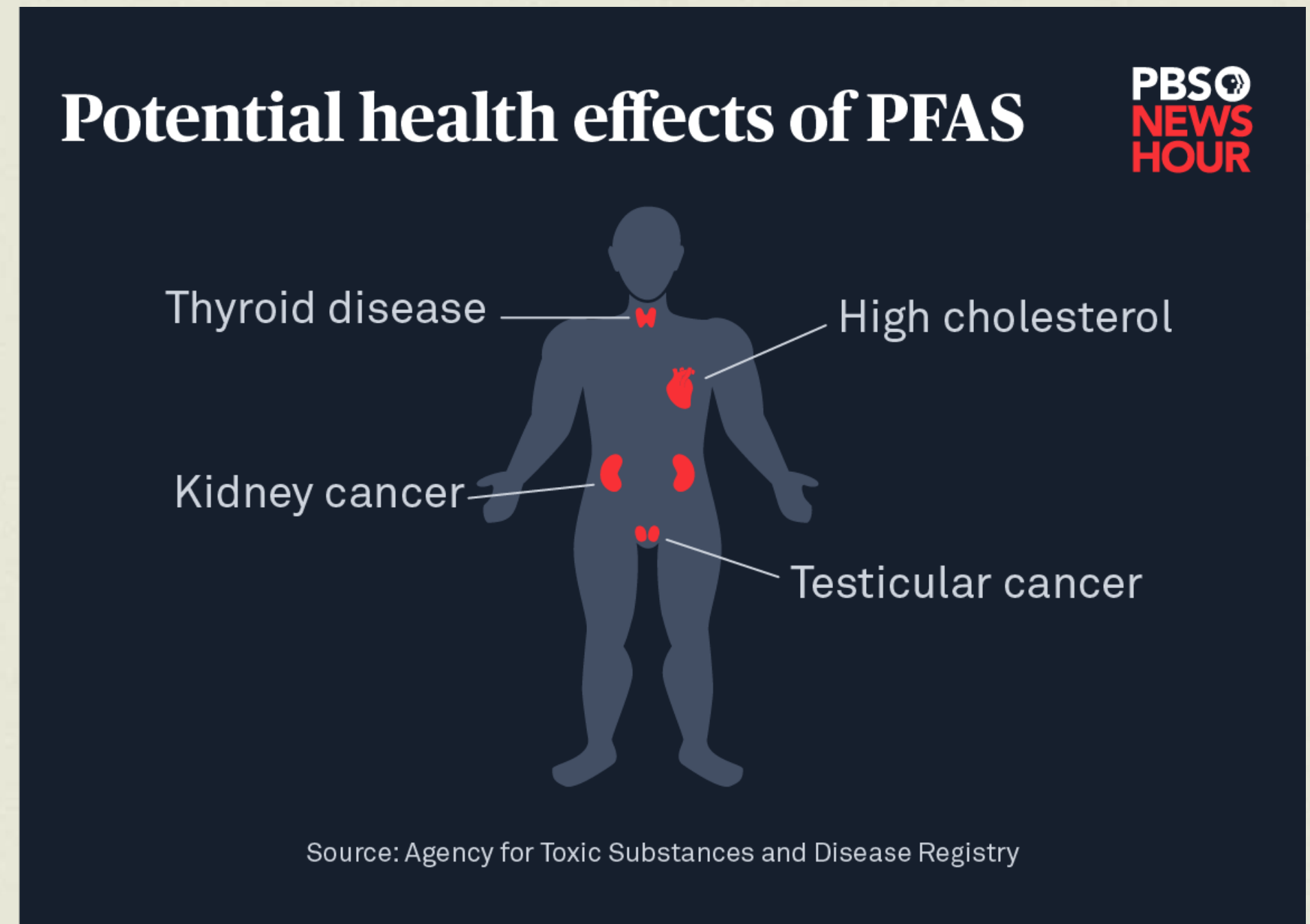
Environmental & Health Impacts

- A regular-sized artificial turf field contains 40,000 lbs of plastic
- Each synthetic turf field loses 0.5 to 8.0% of its blades annually, yielding 200 to 3200 pounds of plastic waste to our environment per year
- These microplastics migrate off the field into air, soil, waterways and ocean



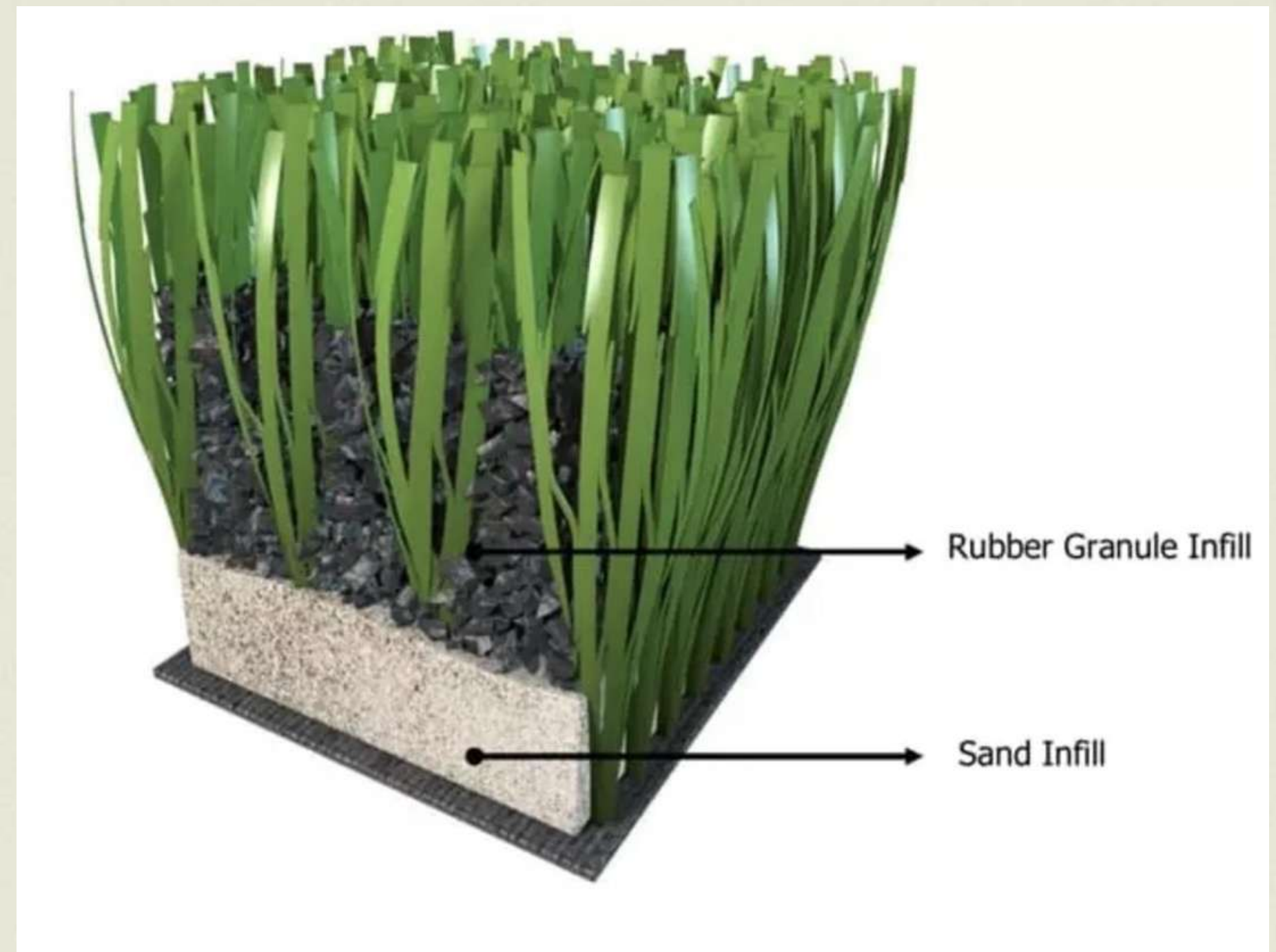
Environmental & Health Impacts

- Mount Sinai researchers have identified hundreds of chemicals in artificial turf, particularly in the "crumb rubber" infill made from recycled tires.
- Mount Sinai and the Toxic Use Reduction Institute (TURI) found that even "natural" or "virgin rubber" alternatives often contain many of the same carcinogens and neurotoxins.
- These plastic artificial turf blades contain harmful chemicals such as PFAS that is known to be harmful to human health and the environment.



Environmental & Health Impacts

- A regular sized artificial turf field contains 150,000 pounds of crumb rubber
- A European Commission report in 2018 estimated that 1 to 4 percent of field infill needs to be replaced yearly due to migrating off-site or compacting.
- The infill that keeps the field's plastic blades in place typically measures 0.5-0.3 millimeters in size, therefore meeting the technical definition of microplastics in the European Union





Environmental & Health Impacts

Extreme Temperatures on Artificial Turf Field

- Artificial turf can be 20–70° F hotter than natural grass.
- Heat-Related Illness: These conditions increase the risk of skin burns, dehydration, and heat stroke. Children are particularly vulnerable because they regulate body temperature less efficiently than adults.
- Head-Height Heat: Air temperature at a child's head height is significantly hotter over turf than grass, regardless of the type of infill used.



Allen High School cornerback's cleat after practicing on artificial turf field in Texas

Environmental & Health Impacts

Location: Kehler Field, Westfield, NJ
Date: June 21, 2024
Time: 2:27 pm
Air Temp 96F

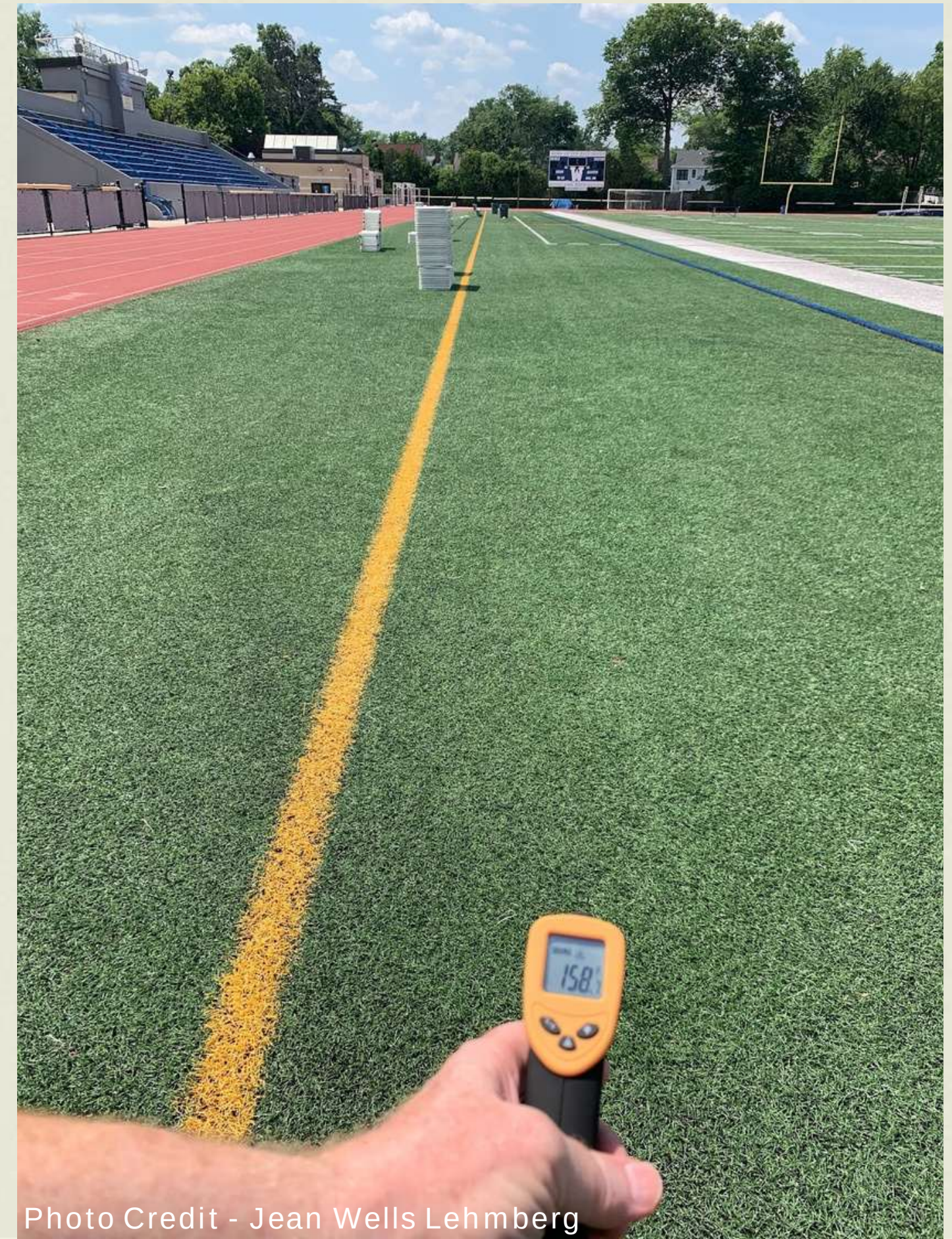


Photo Credit - Jean Wells Lehmberg



Natural Grass
97F



Asphalt
145F

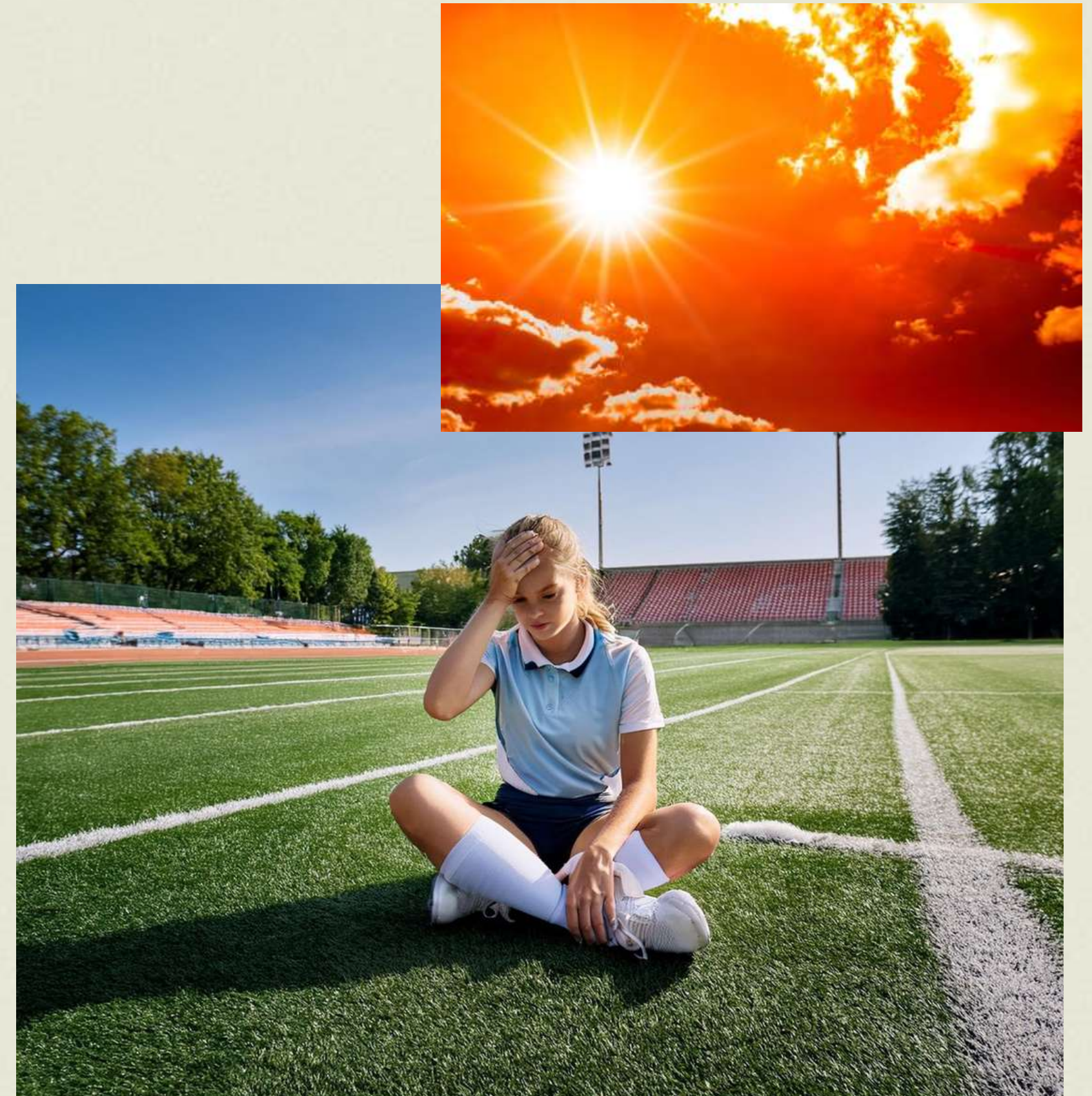


Plastic Grass
145F

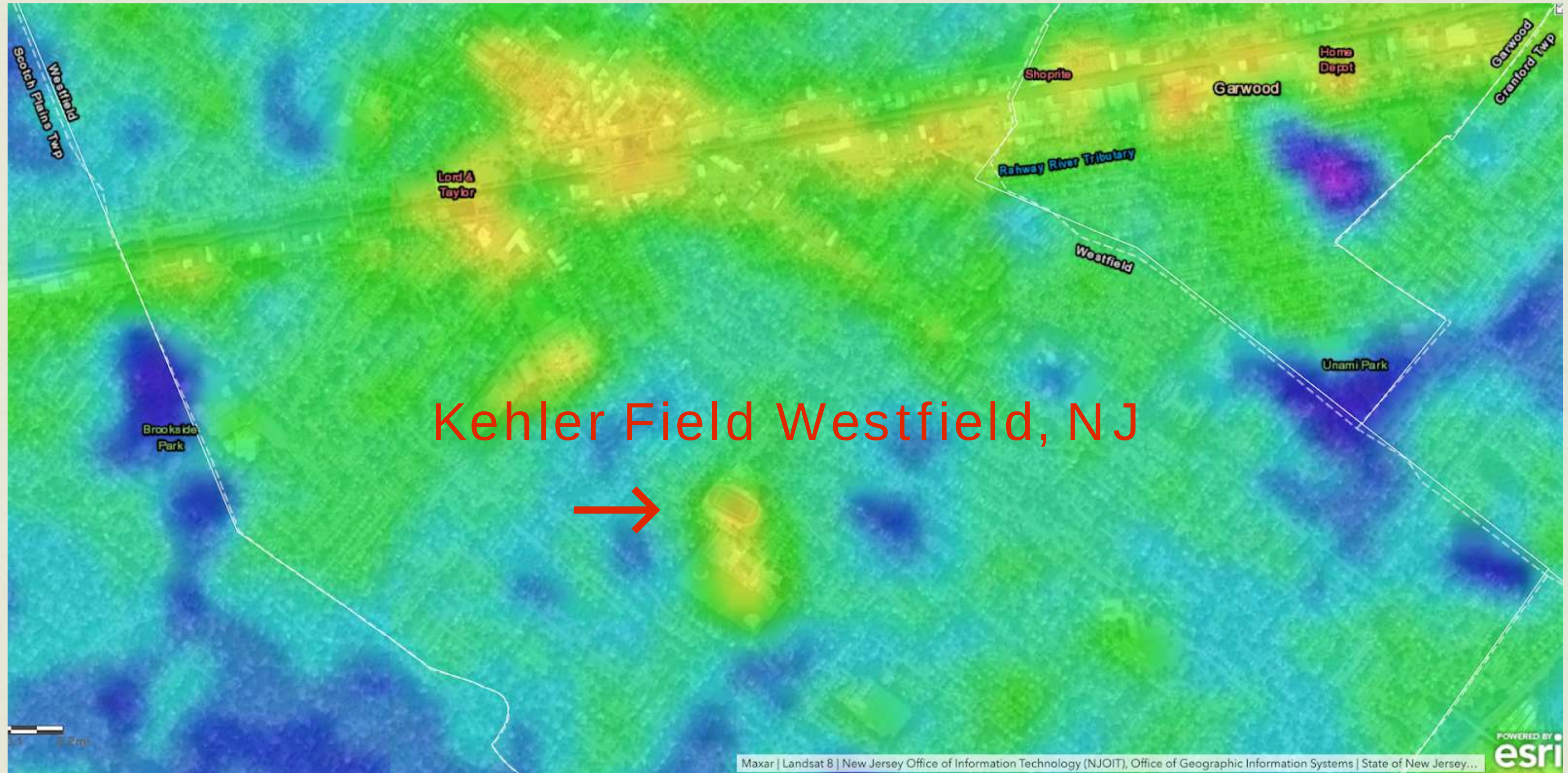
Health Impacts

Heat Related Illness

- Heat stroke is the third-most common cause of sudden death among high school athletes behind cardiac arrest and traumatic brain injuries
- Hinchliffe Stadium Paterson NJ- 100 people treated, several hospitalized due to dangerous heat



Artificial Turf Forms Heat Islands



Environmental Impacts: Waste

- A synthetic turf field lasts 8 to 10 years on average
- Thousands of pounds of infill and plastic carpet must be removed and replaced at disposal
- Mixed plastic waste, such as synthetic turf, is not recyclable using conventional methods
- Sent to landfills or dumped illegally



Photo courtesy of Amanda Farber

Learning from Experts

Conversations with natural grass experts were guided by goal of learning as much as possible and expanding knowledge of natural grass management, how athletic fields are designed and built, and the ways in which we can support municipalities transitioning to natural grass playing fields.





Joe Hill
Manager of Turf, Grounds,
and Custodial Operations,
Iowa State University



Casey Carrick
Assistant Athletic
Director of Facilities and
Turf Management,
University of North
Carolina



Sarah Evans
Ph.D, Icahn School of
Medicine at Mount Sinai



Keith Fisher
Sports Field Manager,
Central Regional School
District, NJ

Economic Analysis

Natural grass is cheaper than artificial turf over the long term.



NATURAL GRASS – A FAR MORE COST-EFFECTIVE OPTION

20-YEAR TOTAL COST OF OWNERSHIP		
	Artificial Turf	Natural Grass
Field Construction	\$2,700,000	\$430,000
Stormwater Management	\$670,000	\$670,000
Contingency (15%)	\$505,171	\$165,000
Annual Maintenance (x20)	\$506,000	\$1,194,000
Carpet Replacement (x2)	\$1,400,000	\$0
Debt Service	\$1,355,541	\$442,750
Total Costs	\$7,136,712	\$2,901,750

*Natural Grass is a pervious surface and may not require Stormwater investment. Included as a worst-case scenario.

Economic Analysis

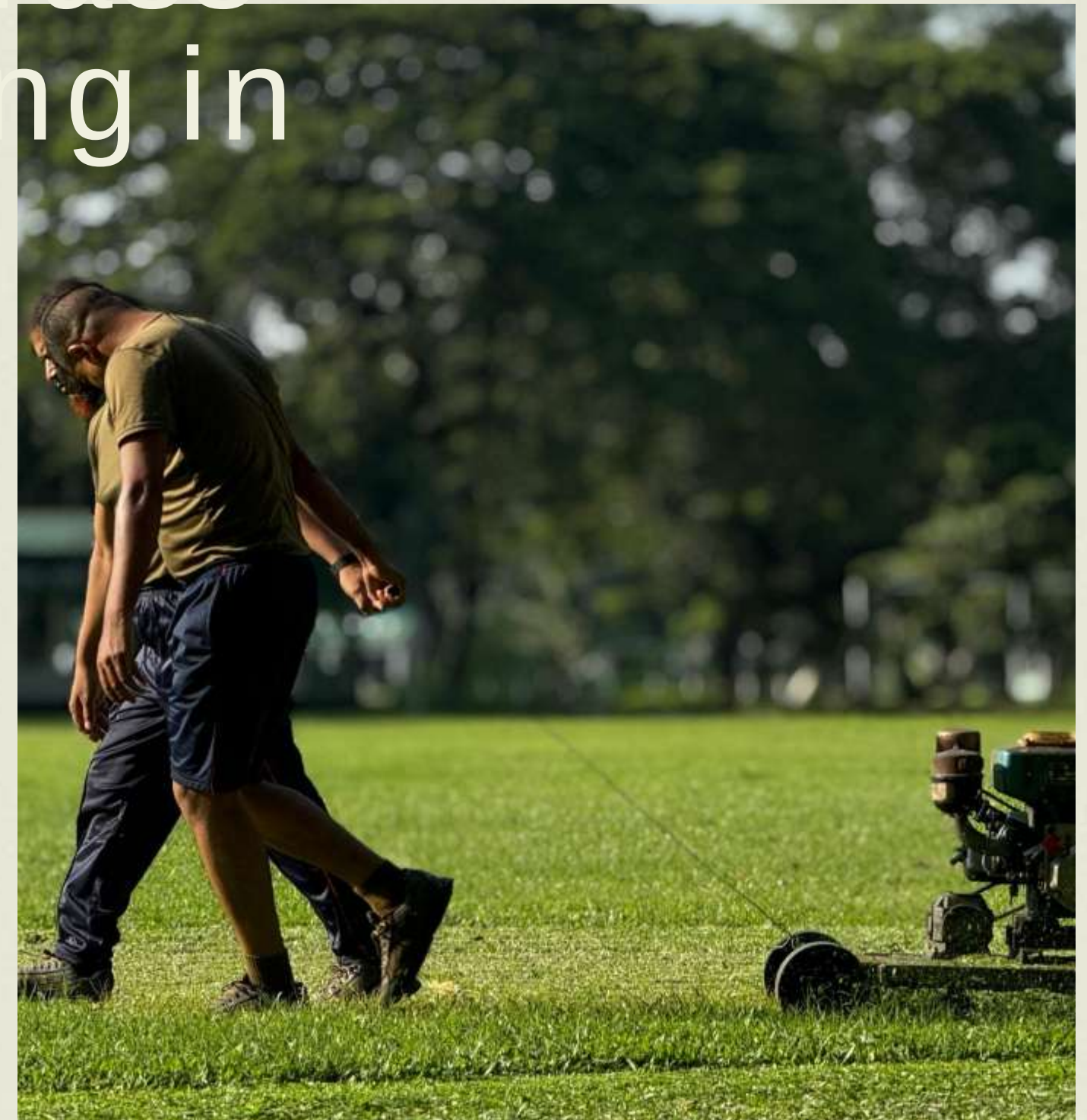
How are towns paying and funding artificial turf?

- Taxpayer approved bonds (debt)- Maplewood, NJ
- Open Space Trust Fund - Milburn, NJ
- Municipal budgets
- School budgeting
- Private and Corporate Donations - Sports Field Complex
- State grants from the Green Acres Program
 - \$10M spent on artificial turf fields in 2023
 - \$5M in 2024

Image Caption | Photographer Name

Investing in Natural Grass means you are investing in jobs & NJ Farms

- Saves towns and schools money over the long term
- Provides jobs for sports field managers and experts- a profession steadily declining in NJ
- Supports NJ Sod Farms rather than a turf company from Georgia



Verona Study

Conclusion

- Natural grass was more cost-effective in the long run, even when the high cost of hiring a professional was taken into account
- A well maintained natural grass field, was also found to contain fewer compounds that harm the environment and human health and have lower levels of emissions over its lifetime
- Safety considerations as a whole also favor natural grass fields
- Although technologies exist that decrease the heat on artificial turf fields, they still do not decrease heat to levels comparable to natural grass fields



Artificial Turf and Natural Grass:
*a comparative analysis of environmental impact,
 chemical exposure, injury, surface heat, playable hours
 and cost*

PSEG Institute for Sustainability Studies Green Teams Project
 Summer 2024

Proposals

14 New Artificial Turf Fields

Middlesex County sports complex for Thomas Edison Park



The expanded active sports facilities planned at Thomas A. Edison Park, a Middlesex County property, in Edison.
Provided By The County

The park already has several playing fields, over a dozen tennis courts, a running track, baseball fields, and a parking lot for 300 cars. Middlesex County's proposal includes building 14 new artificial turf sports fields, 16 tennis courts, parking for 1,350 cars, and more.

Cost for AT fields= \$66million
 Total cost= \$350 million

Pending Proposals

Maplewood proposal for Ritzer Field



- South Orange Maplewood School District (SOMSD) is deciding whether or not to convert the current natural grass Ritzer Field into artificial turf
- The district is already facing budget cuts, an artificial turf field (\$5M-\$7.5M) would put them in serious debt. Bond measure.
- The field has received little to no maintenance
- Residents are calling on the district to invest in maintaining the grass field instead of converting to plastic grass.

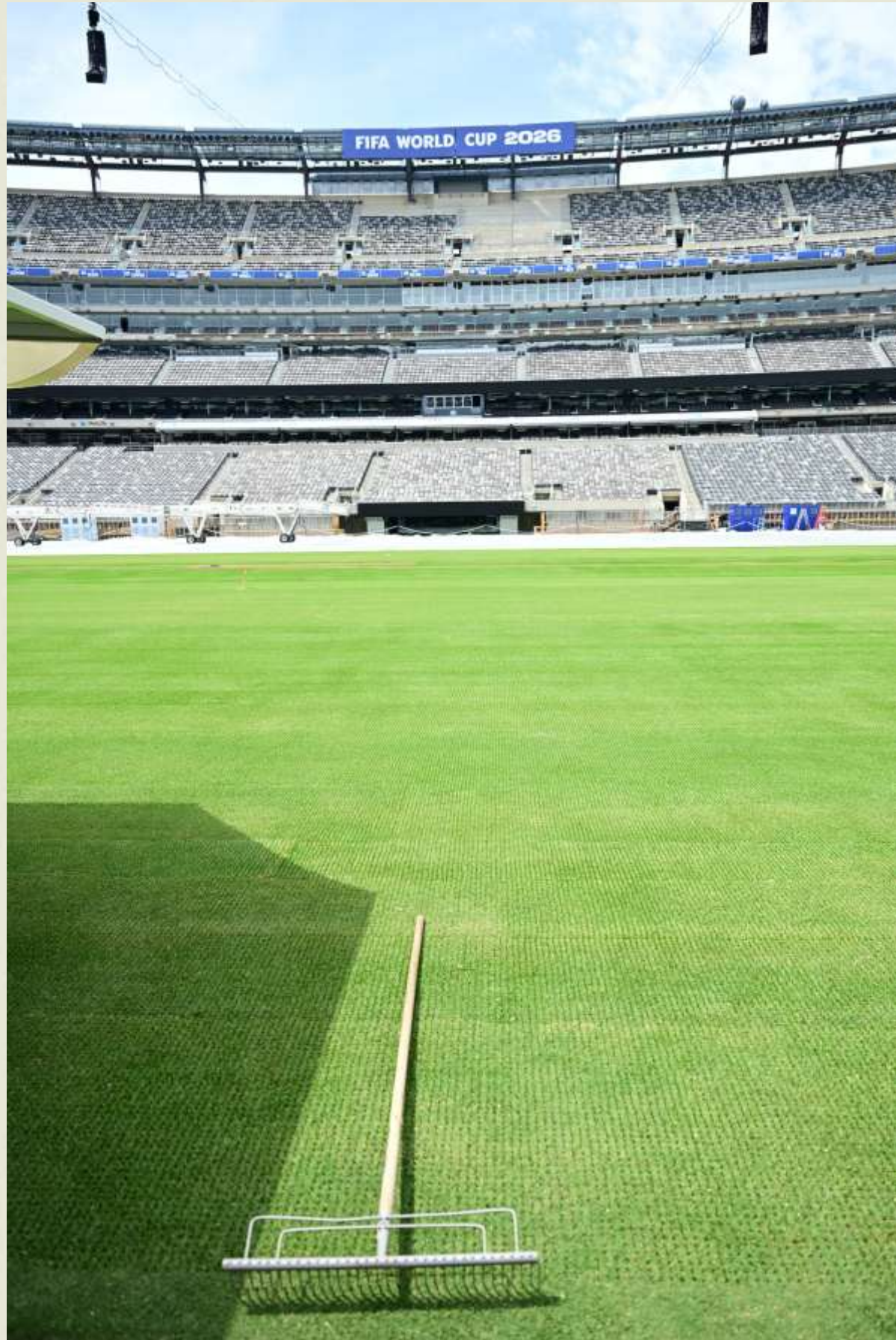
MetLife Stadium to put in grass field for 2026 World Cup, stick with turf for NFL season

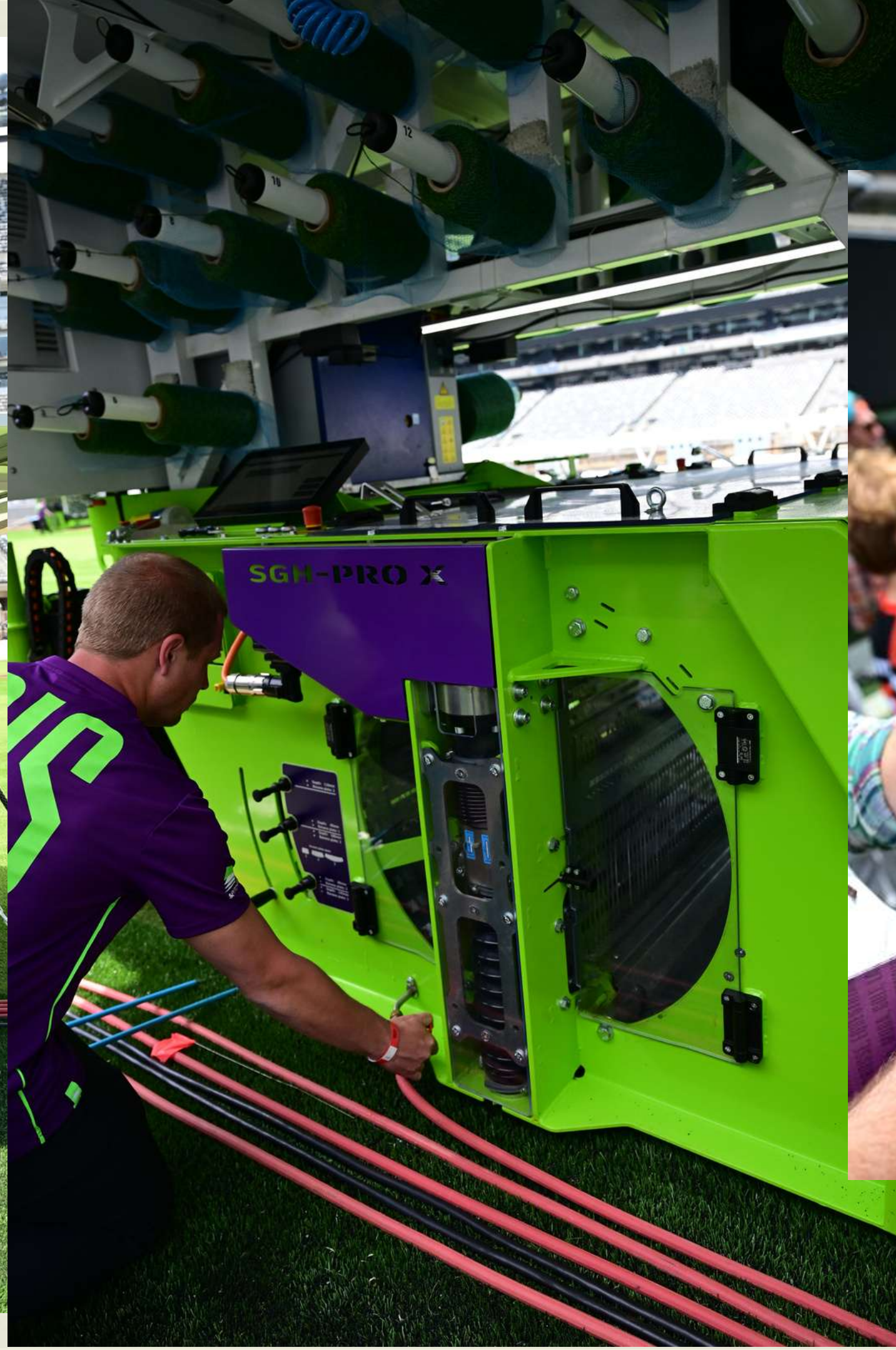
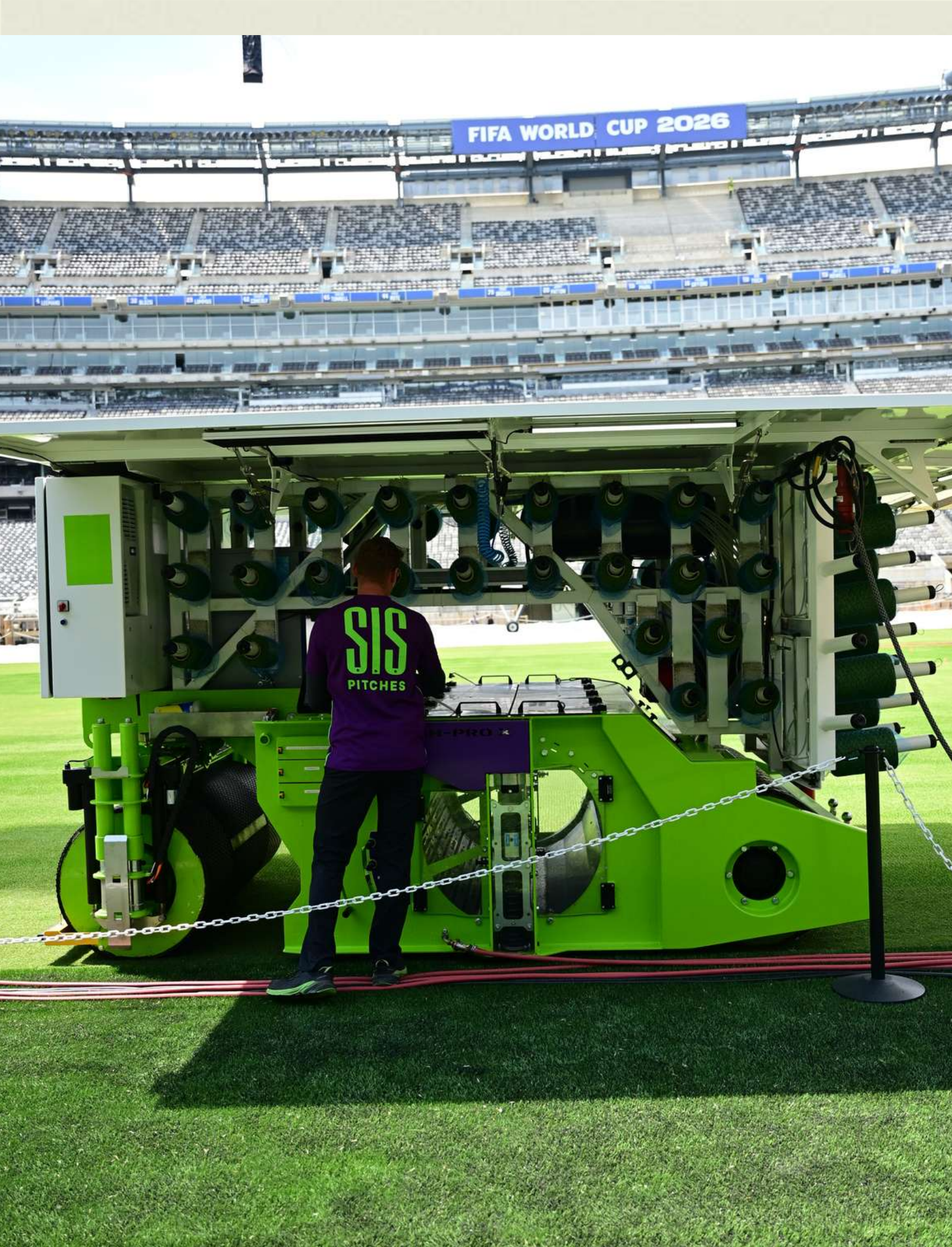


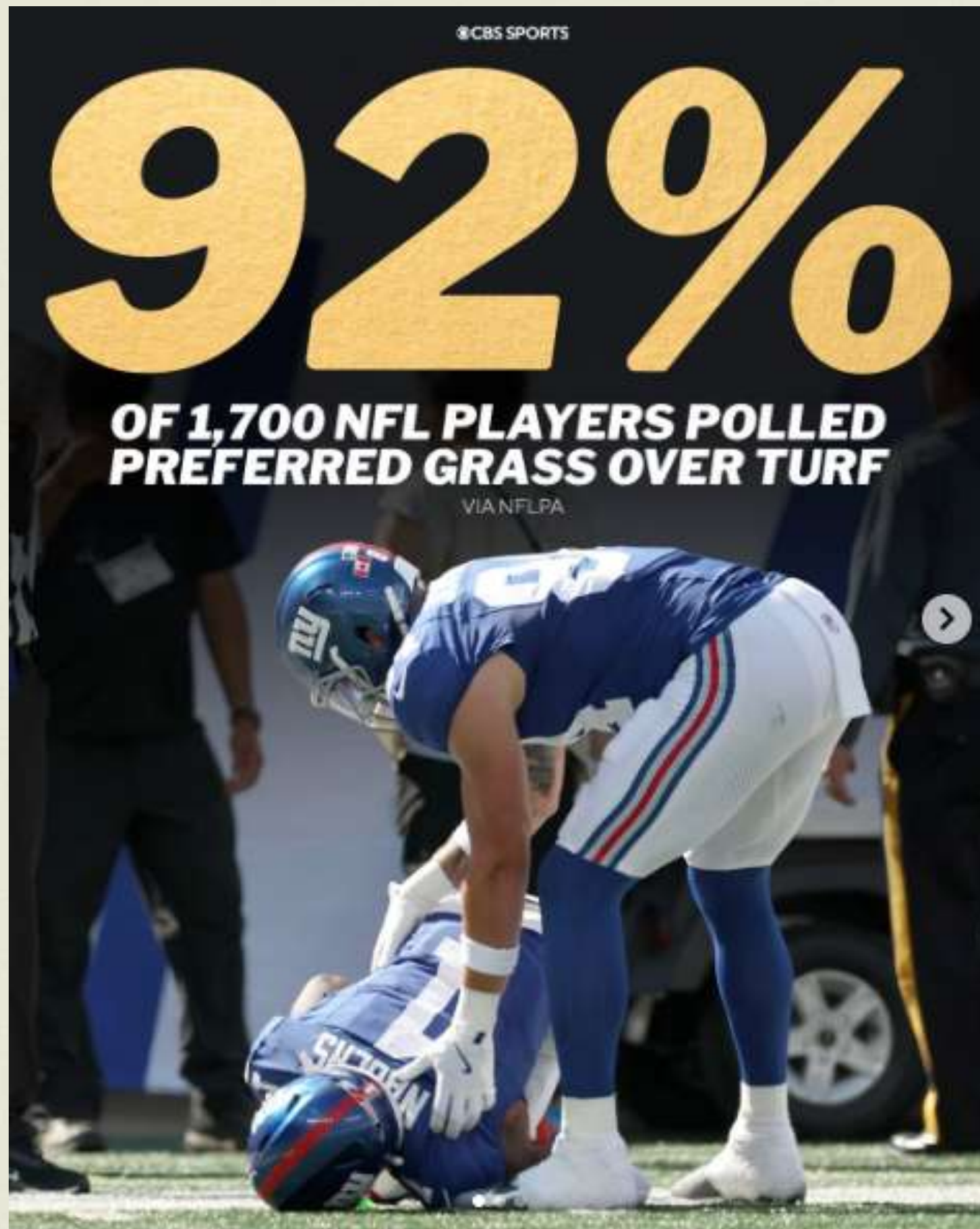
By **Charlotte Carroll** and **Melanie Anzidei**
March 25, 2024

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NFL Players Against Artificial Turf

- Jermaine Eluemunor, (NY Giants)
- Tyrone Tracy Jr, (NY Giants)
- Odell Beckham Jr. (former NY Giants)
- Aaron Rodgers, former Jets
- George Kittle & Nick Bosa, (49ers)
- Kelce Brothers (Chiefs, former Eagles)
- Michael Pittman, (Colts)
- Cooper Kupp (LA Rams)
- Matthew Stafford (LA Rams)

2026 NFLPA Report Card Home Field Grades

	Turf	Grass
A+		
A		
A-		
B+		
B		
B-		
C+		
C		
C-		
D+		
D		
D-		
F+		
F		
F-		

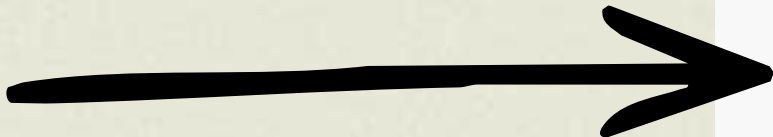


Table: Lev Akabas • Source: ESPN

Athletes Against Artificial Turf

- Global Soccer (75%): A FIFA-commissioned study of 1,129 elite players from 44 countries found that approximately three-quarters (75%) believed all top-level games should be played on natural grass.
- [The U.S. Women's National Team \(USWNT\)](#) has been a leading voice in the push for natural grass, citing both safety and gender equity as primary drivers. Their preference is supported by large-scale player surveys and significant legal actions.
- Comparing Safety Standards
 - FIFA vs. NFL
 - FIFA maintains an exhaustive set of criteria, the FIFA Quality Concept, to ensure natural grass pitches are safe, uniform, and optimal for player health. - prohibits artificial surfaces
 - NFL allows individual stadium owners to choose their playing surface

Comparing Safety Standards

- Comparing Safety Standards
 - FIFA vs. NFL
 - FIFA maintains an exhaustive set of criteria, the FIFA Quality Concept, to ensure natural grass pitches are safe, uniform, and optimal for player health. - prohibits artificial surfaces
 - NFL allows individual stadium owners to choose their playing surface
- New Mandates: Due to player advocacy, the NFL and NFLPA implemented a new model requiring stadiums to choose from a newly approved set of safety metrics for all turf and grass fields by 2028.
 - All domestic and international NFL stadiums must install playing surfaces selected from a pre-approved, laboratory-tested library co-developed by the league and the NFL Players Association.
 - Mandatory Technical Metrics (traction, firmness, infill consistency)
 - Standardized testing tools ([The BEAST Tester](#))

Proposed Solutions for NJ

- Invest in Human Capital: New Jersey must provide dedicated funding for towns and school districts to hire full-time, certified natural grass experts and professional grounds managers.
- Protect Public Funding: Support legislation like S3254(Mukherji)/A4908(Collazos-Gill), which would prohibit the use of [Green Acres](#) funds for the purchase or installation of toxic artificial turf.
- Mandate Consultation: Require municipalities to undergo a natural grass feasibility study by an independent expert before approving any synthetic turf development.
- Organic Management Training: State-sponsored programs should be established to train existing municipal workers in modern organic turf management to ensure long-term sustainability.

How You Can Help!

Advocacy on the local level

- Education: Educate your town council, school board of ed, and local officials on the benefits of natural grass (health, environment, cost).
- Build Grassroots support: Join our bimonthly calls, build support from athletes for natural grass, and educate residents in your community.
- Resolution/Ordinance: Lobby for a resolution or ordinance that would help promote natural grass playing fields and reduce artificial turf development
 - e.g.
 - Extensive studies and review by a third-party consultant - not the town engineer
 - Prohibit using the Open Space Trust Fund for artificial turf
 - Full ban or moratorium on artificial turf
- NJ Sierra Club Artificial Turf Toolkit



Natural grass is a living filter,
a cooling agent, and the safest
surface for our athletes.

It is time for New Jersey to
stop subsidizing plastic and
start investing in our soil.

Take Action Now

Tell Assemblywoman Swain to
Post the Green Acres Artificial
Turf Bill, A4908, to the
Assembly Appropriations
Committee ASAP!



Tell Senator Sarlo to Post the
Green Acres Artificial Turf Bill,
S3254 (Mukherji/Greenstein),
to the Senate Budget &
Appropriations Committee!



A close-up, low-angle shot of a lush green grassy field. The grass blades are long and slender, with numerous small, glistening dew drops clinging to their surfaces. The background is softly blurred, showing more of the field and some distant trees under a bright sky. The overall lighting is warm and natural, suggesting early morning or late afternoon.

Questions?



SIERRA CLUB
NEW JERSEY CHAPTER