Plastic Turf vs. Natural playing surfaces:
Environmental and Health Concerns of Plastic Turf

Midcoast Community Council Meeting
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Plastic Free Future

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A hotly debated topic around the country

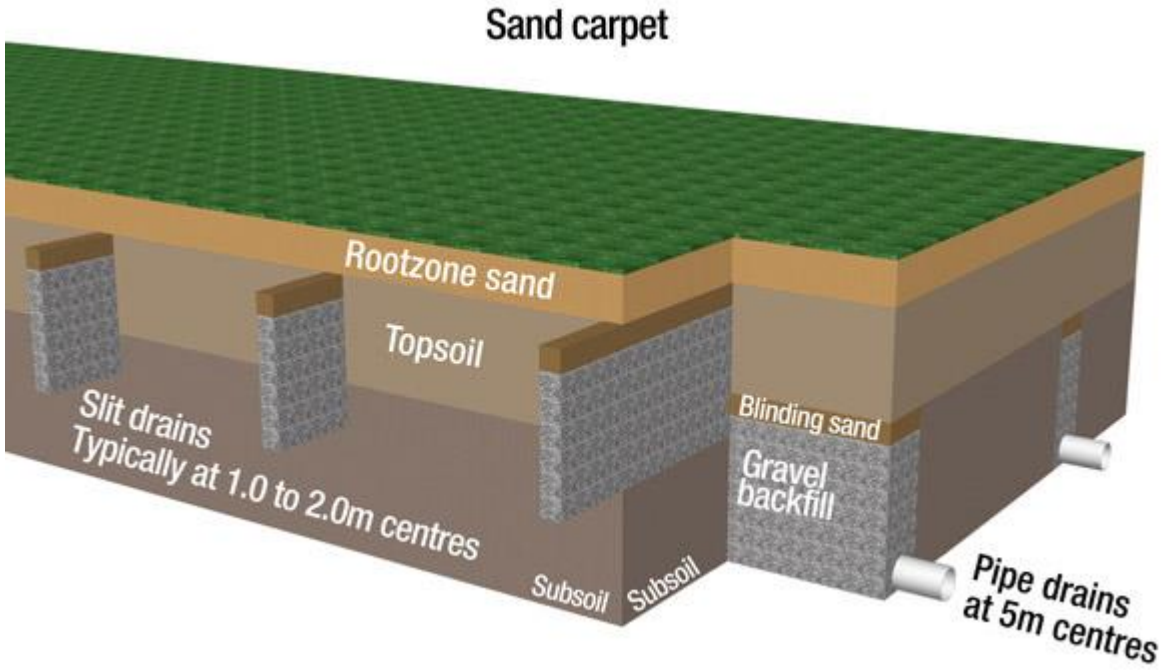
Los Gatos Unified School District and Auburn School District have recently confronted the issue

Plastic Turf = Artificial Turf = Synthetic Turf

Natural Turf = Grass Turf = Turf

Construction

Source: matrix-turf.com



https://sites.duke.edu/wcwp/tournament-guides/world-cup-2015-guide/all-about-that-turf/turf-vs-grass/

Typical Synthetic Turf Surface

Plastic grass blades

Crumb rubber infill

Synthetic or Natural? Main issues:

- Health
  - Exposure to toxic chemicals
  - Heat
  - Injuries
- Environmental
  - Stormwater pollution
  - Disrupted hydrology
  - Habitat loss
  - Climate
  - Environmental justice
  - Solid waste
  - Microplastics
  - PFAS

- Costs
  - Installation
  - Long term maintenance
  - Replacement costs
    - Including solid waste disposal

- Quality/durability

Are plastic turf playing fields safe?

Chemical Exposures

- Inhalation & accidental ingestion
- Skin contact (dermal abrasion)
- Infills (especially crumb rubber!)
- Plastic grass blades (microplastics, PFAS)

Heat

- Can exceed 160°F on clear 80°F sunny days
- Hotter than adjacent asphalt
- Contributes to urban heat island

Injuries

- Turf burns
- Impact injuries
- NFL: 69% higher rate of non-contact foot/ankle injuries
- Increase risk to heat related illness
- Burns

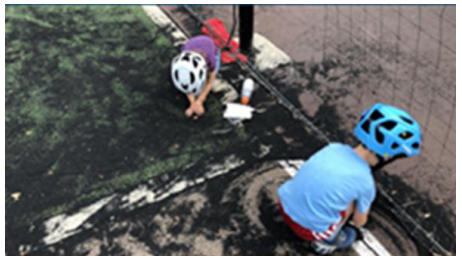
Sydney Leroux

Are plastic turf playing fields safe?

Chemicals

- Plastic turf materials contain chemicals known to be hazardous
- Few short term studies, inconclusive
- No studies on long term, chronic exposure
- California Office of Environmental Health Hazard Assessment underway
- Adverse impacts are suspected, but still hypothetical
  (principal of conservatism: cigarettes, second hand smoke, lead, asbestos, BPA, climate change)
- Several Turf companies and school districts have been cited in violation of Prop 65 for lead and carbon black

Are plastic turf playing fields safe?



Icahn School of Medicine at Mount Sinai

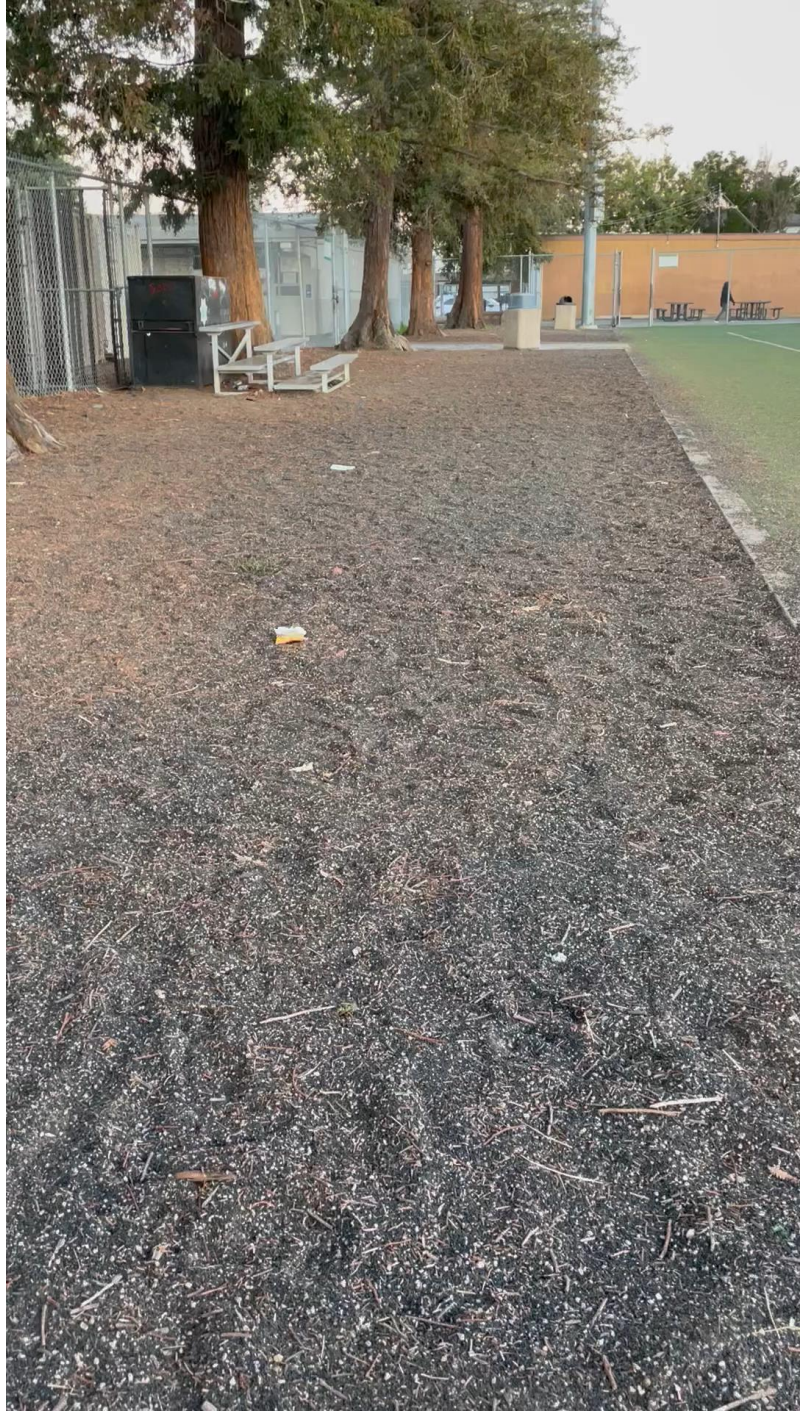
Children's Environmental Health Center, Icahn School of Medicine and Public Health and the National Center for Health Research weigh in:

- Children are uniquely vulnerable to harmful exposures of AT surfaces
- Studies to assess the safety of AT are ongoing and inconclusive
- Depends on dose, frequency and duration
- Chemicals banned from children's toys are present in Plastic Turf fields
- Until finding are available and conclusive, recommend moratorium

What are the environmental concerns?

- Contribution to plastic pollution, solid waste (landfill) and environmental injustice
- Contribute to climate change
- Microplastics and PFAS pollution
- Chemical run-off and soil contamination
- Increased surface runoff
- Flood/drought mitigation
- Contribute to Urban Heat Island effect
- Habitat loss and climate impacts- loss of critical soil functions
    - Cooling effect from evapotranspiration
    - Carbon sequestration
    - Loss of habitat and refuge for insects and birds
- California Office of Environmental Health Hazard Assessment underway
- Several Turf companies and school districts have been cited in violation of Prop 65 for lead and carbon black

A worn artificial turf field on the grounds of a middle school, with no regard for crumb rubber pollution or toxicity



Natural Grass Turf

- Sequester CO_2
- Cool surrounding air
- Release O_2 and H_2O
- Filter stormwater, recharge soil water
- Habitat & refuge for insects and birds
- No EJ concerns
- No microplastics
- *Natural sensory experience, aesthetics*

Synthetic Plastic Turf

- Emit CO_2
- Heat surrounding air
- Release hazardous VOCs
- Increase runoff, pollute stormwater
- Are biological deserts
- Perpetuate EJ issues
- Contribute microplastic pollution
- *Artificial, non-natural experience*

Costs

Synthetic Turf:

- Higher upfront costs for materials + installation
- Lower annual maintenance costs
- Replacement every 8-10 years

*Most estimates indicate that the costs of artificial turf and natural grass are similar over the long term.

Table 1: Comparison of life-cycle costs	
Field type	**16-year annualized costs**
Natural soil-based field	$33,522
Sand-cap grass field	$49,318
Basic synthetic field	$65,849
Premium synthetic field	$109,013

Source: Brad Fresenburg, "More Answers to Questions about Synthetic Fields – Safety and Cost Comparison." University of Missouri.

Athletes, Coaches and Trainers prefer Natural Turf

2015 WOMEN'S WORLD CUP

Players officially file lawsuit against FIFA, CSA over artificial turf at 2015 Women's World Cup

by Jeff Kassouf October 1, 2014

0 Comments

FIFPRO FOOTBALL PLAYERS WORLDWIDE

Home ... Injury

We want to play on natural grass

Injury Statement

04 February 2020

HOME > HEALTH

NFL stars started a petition to ban artificial turf in football after Odell Beckham's Super Bowl injury

More Information:

https://www.healthyplayingsurfaces.org/

https://www.safehealthyplayingfields.org/

Thank you!

Q & A