

#5

RESOLUTION REGARDING ADDITIONAL ARTIFICIAL TURF FIELDS

Councilors Malakie, Block, Kelley, Wright, Farrell and Humphrey support the following Resolution.

In recognition of concerns regarding artificial turf, including environmental impacts (local heat islands, chemical and microplastic shedding, and lifecycle greenhouse gas impacts), lack of evidence of recyclability, short-term health risks (orthopedic and head injuries, turf burns and infections, heat stroke) and long-term health risks to both athletes and general public from increased body burden of exposure to micro/nanoplastics, PFAS and other chemicals, and the unknown future disposal costs of used artificial turf that may come to be considered hazardous waste, we request that the plan for artificial turf at Albemarle be removed from the Capital Improvement Plan and the designated \$2.2 million of ARPA funds be used for other purposes, and that no additional artificial turf fields be planned on public land in Newton, beyond the already approved replacement field at NNHS.

Background

The following organizations have provided statements (attached) opposing the use of artificial turf, focusing on environmental and health concerns, with links to further sources:

- Green Newton
- Newton's Sustainable Materials Management Commission
- Newton Democratic City Committee Climate Crisis Subcommittee
- Charles River Watershed Association
- Sierra Club of Massachusetts

In addition, testimony was received at the February 16, 2023 Programs & Services public hearing (NewTV video <https://vimeo.com/799349359> starting at 58:05), including from:

- Dr. Brita Lundberg, M.D., of Newton, chair of Greater Boston Physicians for Social Responsibility (starting at 1:05:34)
- Dr. Kyla Bennett, PhD, Science Director for Public Employees for Environmental Responsibility (1:12:42)
- Ellie Goldberg of Newton (1:19:38)
- Former alderman Ted Hess-Mahan (1:26:15)
- Former councilor Barbara Brousal-Glaser (1:33:40)

NSHS experience

Nine months after the July/August 2023 replacement of the two artificial turf fields at Newton South, ground near the fields is still contaminated with spilled old crumb rubber fill and new TPE (thermoplastic elastomer) fill. No evidence has been provided that the promised recycling

of NSHS' old artificial turf has occurred or will occur. Installation contractor R.A.D. Sports sent the rolls including infill to APW Enterprises, 191 South Keim Street, Pottstown, PA. Bills of lading confirm the delivery of 31 truckloads to this address, which is the Pottstown Industrial Complex. APW Enterprises dba Artificial Turf Recycling occupies buildings 2G3 & 2H, an approximately 960-ft long warehouse space in this complex. They are separating infill from carpet, but owner Allen Waterman has not said who their 'recycling partner' for used carpet is, or where it is located. Nor has he provided any evidence that used carpet is being turned into plastic lumber or anything else.

NNHS contract

In an improvement, the Invitation for Bids for the NNHS football field replacement contained these provisions regarding recycling:

- A. The existing synthetic turf and infill materials will be completely removed and recycled by the Contractor. Recycle both the turf and infill systems removed from the existing field, to the maximum extent practicable.
- B. Submit a minimum of two (2) recycling facilities for approval by the Owner.
- C. Provide chain of custody documentation from removal of the field and infill materials to receiving source(s).

The deadline for bids was April 4, 2024. Once again, R.A.D. Sports was the only bidder. Despite the provision noted above, R.A.D. Sports did not provide *any* recycling facilities for approval, notably, not even APW Enterprises.

THEREFORE, Councilors Malakie, Block, Kelley, Wright, Farrell and Humphrey request that plans for artificial turf at Albemarle be removed from the Capital Improvement Plan and the designated \$2.2 million of ARPA funds be used for other purposes, and that no additional artificial turf fields be planned on public land, beyond the already approved replacement field at NNHS.



Celebrating 34 Years of Environmental Leadership!

Green Newton

Board of Directors

Marcia Cooper
President

Jim Purdy
Vice President

Dan Ruben
Chair

Sharon Cushing
Treasurer

Barbara Brousal-Glaser
Clerk

Julio Carrera
Craig Forman
Alan Gordon
Brian Hodgson
Sunwoo Kahng
Karen Kipman
John Lewis
Don Ross
Mindy Gregory Sieber
Peter Smith
Elizabeth Sockwell
Andrew Thompson

Advisory Board

Ana Zarina Asuaje Solon
Louise Bruyn, *Founder*
Beverly Craig
Lucia Dolan
Beverly Droz
Kevin Dutt
Ellie Goldberg
Barbara Herson
Ira Krepchin
Lois Levin
Brooke Lipsitt
Brita Lundberg
Jean MacRae
Ken Mallory
Heather Tausig
Jay Walter
Tony Zelle

Newton City Council
Newton City Hall
1000 Commonwealth Ave.
Newton, MA 02459

December 15, 2023

Honorable City Councilors,

As you know, Green Newton has a long history of advocating for the disuse of chemicals known to be toxic to human and environmental health and for their substitution with safer materials. We were strong advocates of an Integrated Pest Management program for the City of Newton's Parks and Schools to reduce the exposure of pesticides on residents, in particular to children. We advocated for the City's multiple plastics packaging reduction ordinances, with the understanding that a reduction in single use plastics means not just a reduction in waste but also a reduction in toxic chemicals such as PFAS and BPA in our environment and in our bodies. The City Council overwhelmingly passed the last packaging ordinance in September 2023 after strong agreement that these plastic materials cause harm to all of us and must be reduced.

Artificial turf is the same harmful plastic in another form. Green Newton understands the competing interests that play into the decision to install artificial turf at the South and North high schools, but we ask you to consider that, if you agree that plastic bags and take out containers are bad for us, that artificial turf is equally bad or worse. Please consider the following:

Toxicity - The harmful effects of chemicals contained in plastics is no longer in question. The EPA has designated PFOS and PFOA as hazardous substances and is considering adding more PFAS to the list. The Massachusetts state legislature is currently considering 4 separate bills to restrict the use of artificial turf (H3948, S2057, S523, and S524).

Greenhouse Gas - Assuming a 10-year lifespan, the life cycle carbon emissions of the proposed NNHS AT field replacement with a TPE infill (with recycling) would be the same amount of carbon as that generated by the use of 65 million black plastic takeout containers, or 200 containers per Newton household per year for 10 years. This effectively negates much of the benefit of the ordinance passed in September.

Questionable Recyclability - Commissioner Nicole Banks recently addressed the reuse of the rubber crumb and sand infill in an email to city councilors, but did not clarify the recycling of the turf material itself. The plastics industry is rife with 'greenwashing'

promises of recycling. The City needs to abide by higher standards and not rely solely on the promises of contractors. It is unclear if there is real evidence of artificial turf's recyclability.

Green Newton recognizes that there is an argument to be made from parents and sports groups to support the installation of artificial turf at certain playing fields, however our group's mission is to advocate for the environmental health and safety of people and the environment.

Natural grass was used prior to the existence of artificial turf and sports were still played on a regular basis throughout our community. As environmentalists, we know there are costs that we ought to seriously consider, such as the effects of chemicals and microplastics on our bodies and on nature. The eventual cost to clean up these chemicals and particles will be enormous, as we know from our experience with Superfund sites. These calculations have not been sufficiently addressed by city officials. Grass, when managed well, is a heat sink and a resource to beneficial insects and animals. Artificial turf is the absolute opposite.

The City has a proven alternative to artificial turf—natural grass. Before a financial commitment is made to install artificial turf at Newton North again, Green Newton requests that you pause the decision on December 18 to take time to thoroughly investigate the safety of artificial turf for our children and the environment, and conduct a lifetime cost-benefit analysis of artificial turf versus natural grass.

Respectfully,



Judy Jacobs
Executive Director
Green Newton



**CITY OF NEWTON
SUSTAINABLE MATERIALS
MANAGEMENT COMMISSION**

**1000 Commonwealth Avenue
Newton Centre, MA 02459-1449
Ruthanne Fuller, Mayor**

Members: Steven Ferrey, Alan Gordon, Sunwoo Kahng (Chair), Meryl Kessler (Vice Chair), John Lewis, Robin Maltz, Vince McKay, Marian Rambelle, Karen Slote, Miles Smith, Carl Valente (Secretary)

Ex-Officio Member: Jim McGonagle, DPW Commissioner

Advisory: Waneta Trabert, DPW Sustainable Materials Management Division Director

November 27, 2023

Newton City Council
Newton City Hall
1000 Commonwealth Avenue
Newton Centre, MA 02459-1449

RE: Waste, Toxicity, and GHG Considerations in Artificial Turf Installation and Disposal at Newton North High School

Dear Honorable Members of City Council,

On August 25, 2023 we sent the Council and the Mayor [a letter](#) opposing the use of artificial turf (AT) on the City's athletic fields. The Commission recognizes that the City has competing considerations in its decision to use AT or natural grass. However, we are concerned that the City is again not giving proper weight to the longer term issues of waste generation, hazardous chemical proliferation, and greenhouse gas(GHG) emissions compared to the issue of adequate playing capacity, as it meets on November 28 to allocate funding for the replacement of the Newton North High School AT field.

In the August letter, we recommended that the City not use any AT, but that if it did, an organic infill such as cork be used instead of thermoplastic elastomers(TPE). Organic infill has considerably lower GHG emissions while TPE has the highest of any infill product on the market. Against recommendations, Newton Parks, Recreation & Culture Department(NPRCD) chose to remain with its decision to use TPE.

In light of the administration's upcoming [request](#) to the Program and Services and Finance Committees for the authorization to appropriate \$2.4 million for artificial turf replacement at NNHS, we would like you to once again consider the recommendations from our earlier letter. Two reports that the SMMC used in its deliberations can be viewed [here](#) and [here](#). Below is a summary of our concerns:

- **The life cycle Greenhouse Gas Emissions (GHG) of an AT field using TPE is 5-6 times higher than one that uses a cork infill (with a shock pad)** regardless of whether it is landfilled, incinerated or recycled. A natural grass field, especially if organically managed, can be carbon neutral or even an effective carbon sink.

To put this into perspective, assuming a 10 year lifespan, the life cycle carbon emissions of the proposed NNHS AT field replacement with a TPE infill (with recycling) would be *the same amount of carbon as that generated by the use of 65 million black plastic takeout containers*, or 200 containers per Newton household per year for 10 years. We would need to plant and raise 49,000 tree seedlings for 10 years to sequester that amount of carbon—an unsustainable effort. The City has recognized the ill environmental and health effects of these wasteful containers and have banned them from use in the city. The use of AT fields is no different. The City's support of AT fields might be different if their use were included in the City's GHG Inventory.

- **The Massachusetts State legislature is concerned enough about the use of AT to have four bills pending in this legislative session that would restrict the use of AT for health, safety, and environmental reasons.** Two of the bills have already passed out of committee. Of those four bills, two propose to ban the use of AT fields outright while the other two stipulate that a moratorium be put in place until further studies can be conducted.
- **Further proof is needed regarding the recyclability and reuse of the old infill and turf.** The information used by the city to determine the recycling and reuse of the old material was given by the contractor. The Commission is aware that 'greenwashing' is a common occurrence in the plastics industry and recommends third party verification of recycling and reuse. Our research has provided very little evidence to support that AT materials are being effectively recycled or reused. To rest on the belief—and not fact—that a material will be recycled is imprudent.
- **The specific costs of AT installation should be elucidated and compared to the costs of a sustainable natural grass management program prior to any decision making.** There was no breakdown of costs made public in the recent Newton South High School AT replacement. That project resulted in a substantial contract overrun that required additional ARPA funding. There was also no comparison to the costs of converting to and maintaining a natural grass field. Such opacity makes it difficult to understand the

decision to choose AT over natural grass. Now with the NNHS decision, we are again no clearer on the detailed costs of an AT replacement and have no way of adequately evaluating the choice between AT and grass.

Thank you in advance for your attention to this situation. Please contact me for any additional discussion.

Sincerely,

A handwritten signature in black ink, appearing to read "Sunwoo Kahng". The signature is fluid and cursive, with the first name "Sunwoo" and the last name "Kahng" clearly distinguishable.

Sunwoo Kahng
Chair, Newton Sustainable Materials Management Commission

CC: Mayor Ruthanne Fuller

Position Statement on Proposal for Artificial Turf at Newton South

Newton Democratic City Committee
Climate Crisis Subcommittee
1/3/2023

As Newton residents we recognize the importance of providing all our athletes with the facilities needed to practice and complete full seasons of play for all our sports. Nonetheless, use of artificial turf raises significant health, environmental, and financial concerns. We describe these concerns here and offer an alternative natural-turf solution that we believe will meet the needs of all Newton youth athletic programs.

Health threats posed by artificial turf

Clearly, playing field quality is a key component of meeting the needs of all Newton youth athletic programs.

Artificial turf is extremely durable, which appears to make it the obvious choice if the goal is to maximize availability. However, the choice is not as clear when health risks presented by artificial turf are examined[1]. For example, studies indicate that playing on artificial turf is related to higher rates of abrasions, knee injuries, concussions, and heat illnesses. Even more concerning is the fact that artificial turf contains approximately 350 different chemicals. Many of these have not been sufficiently studied to know what risks they might pose. Of ones that have been studied, many are known to be carcinogens, neurotoxicants, reproductive toxicants, and respiratory irritants. Getting through a team's complete practice and game schedules is important, but not more so than players' short term and long-term health.

Environmental threats posed by artificial turf

In addition to immediate health risks, we are very concerned about the many environmental threats posed by artificial turf. Here we summarize some of the major environmental problems.

Artificial turf quickly contaminates nearby water with PFAS and sheds 480 lbs/year of microplastics[2]. Other contaminants from artificial turf fields that accumulate in water and soil include zinc and heavy metals, such as cadmium and lead[3]. Maintenance of artificial turf fields requires regular use of pesticides (to control bacteria, insects, etc.), disinfectants (to control body fluid spills), and water cannons (to cool excessive heat)[4, 5, 6]. Artificial turf does not handle extreme precipitation well, leading to flooding of nearby areas and rapid deterioration of the turf itself[7]. The infill for artificial turf must be replaced every year, and used turf cannot be recycled, so it generates tons of waste in landfills. Artificial turf reaches significantly higher temperatures than natural grass, contributing to urban heat island effects[8].

The Newton South fields are less than 100 feet from a wetland that is not only wildlife habitat but also regularly entered and monitored by students doing science research. Once in the wetland, it can easily leach into the groundwater.

Financial costs posed by artificial turf

Artificial turf costs more to install and maintain than natural grass[6]. Additionally, the April 2022 Final Report of the PFAS Interagency Task Force suggests that municipalities can be held responsible for cleaning up PFAS contamination[9]. Such clean up can run tens of millions of dollars[10]. Especially given the current override request, moving forward on something so costly in maintenance and in liability as artificial turf seems unwise.

Balancing the need for abundant youth recreational opportunities and for environmental sustainability will require a comprehensive, forward-looking, holistic approach.

Artificial turf fields have distinct playability advantages over natural grass fields, particularly in northern climates. They allow for extended play in both the spring, fall, and even winter seasons, they are playable again more quickly after weather events, and they can accommodate a variety of sports and athletes, including heavier adult players, without breaking down or suffering damaging wear. However, due to their emissions of PFAS “forever” chemicals and other toxins, and their nature of becoming dangerous heat sinks in hot weather—on an 80-degree day, temperature of a turf field can rise to over 115-degrees, exposing young athletes to dehydration, heat stroke, and foot blistering—they are not an acceptable long-term solution. This will be increasingly true as the climate becomes hotter. Another major problem with turf fields is that they have become a path of least resistance that has artificially exaggerated their actual advantages over natural grass fields when those grass fields are properly cared for and administered. Many reasons grass fields have fallen out of favor stem from poor management and maintenance practices and to overuse, which are man-made, solvable problems.

Fundamentally, grass playing fields are living ecosystems and must be understood and managed as such. In that way they are an apt metaphor for our greater societal need to live in a way that is more sustainable and in harmony with nature in order to help prevent the worst effects of the climate crisis. They cannot be treated like a turf field—which is essentially a piece of recreational equipment more akin to a baseball backstop or a tot lot play structure—in that they can only support a certain amount of use before they break down. And like agricultural fields, they also must be allowed to rest and regenerate periodically. But when they are properly managed and maintained, grass fields are cooler, healthier, better for the planet, and result in fewer injuries for young athletes. And with recent advances in organic field maintenance practices, they are also a clearly more sustainable path.

The good news is that sufficient playing field spaces exist in Newton—more than 30 in all—to accommodate the usage needs of school athletics, youth athletics, and public and adult recreation, even with recent developments such as the adoption of a later high school day that have put more pressure on existing field space. Unfortunately, the City of Newton has never undertaken a comprehensive study that takes into account recreational needs, available assets,

and future priorities—a glaring omission for a municipality that prides itself on prudent planning and environmental responsibility. The result for decades has been an artificial zero sum game, with various recreational constituencies competing against each other for a relatively small number of the most playable fields and a push to add more artificial turf fields despite their health risks and environmental dangers. Therefore, we are strongly recommending that instead of a miscast debate on turf vs no turf at certain fields, the city embark on a more responsible path that includes:

- A comprehensive study of the playing field needs of school sports, youth sports, camps, and public and adult recreation as well as available playing field spaces.
- The creation of a sustainable management and maintenance plan for playing fields that includes:
 - Identification of underutilized spaces and a plan to upgrade them and bring them online.
 - Field rotation plans that more evenly spread usage and wear and that allow fields to periodically rest and regenerate.
 - Field maintenance and care practices that reflect the most up to date science on maintaining healthy grass fields while minimizing or eliminating herbicide and pesticide use.
 - A longer term future plan that includes the phasing out of artificial turf fields for replacement with grass and a pilot program of at least one organic field.

[1] Video presentation on Artificial Turf and Children’s Health, 1/27/2022, <https://www.healthandenvironment.org/webinars/96595>, 00:45:28-1:04:07, Sarah Evans, PhD MPH, Institute for Exposomics Research, Department of Environmental Medicine and Public Health, Icahn School of Medicine at Mount Sinai

[2] Video presentation on the dangers of artificial turf for the 12/13/2022 Boston Environmental Action Summit, <https://youtu.be/DXmYJTeQ0ww>, 41:13 – 49:45

[3] The Partnership for Healthy Playing Surfaces, <https://www.healthyplayingsurfaces.org/environment>

[4] Video presentation on the dangers of artificial turf for the 12/13/2022 Boston Environmental Action Summit, <https://youtu.be/DXmYJTeQ0ww>, 41:13 – 49:45

[5] The Partnership for Healthy Playing Surfaces,
<https://www.healthyplayingsurfaces.org/environment>

[6] The Partnership for Healthy Playing Surfaces,
<https://www.healthyplayingsurfaces.org/policy-makers>

[7] Video presentation on the dangers of artificial turf for the 12/13/2022 Boston Environmental Action Summit, <https://youtu.be/DXmYJTeQ0ww>, 41:13 – 49:45

[8] The Partnership for Healthy Playing Surfaces,
<https://www.healthyplayingsurfaces.org/environment>

[9]
<https://www.mma.org/resource/pfas-in-the-commonwealth-of-massachusetts-final-report-of-the-pfas-interagency-task-force/>), p. 60

[10] Corder et al., “The True Cost of PFAS and the Benefits of Acting Now,” *Environmental Science & Technology*, p. B, <https://pubs.acs.org/doi/10.1021/acs.est.1c03565>

Artificial Turf:

CRWA opposes the installation of artificial turf as contrary to our core mission of promoting the health of the Charles River and its watershed. Given the increasing prevalence of synthetic turf usage in watershed communities, CRWA wishes to articulate its position on artificial turf and provide resources for those interested in learning more.

Modern artificial turf generally consists of a base layer of asphalt, concrete, or gravel, a shock absorbent pad, and grass-like pile fibers composed of polyethylene or polypropylene.¹ Infill is placed between these fibers, often made of tire crumb rubber or a similar textured organic material such as wood particles.² From an environmental perspective, the crumb rubber infill and artificial turf fibers are of particular concern because of their potential to migrate into the aquatic environment.

Artificial turf is known to contain potentially harmful compounds.³ Existing studies demonstrate that the use of artificial turf substantially contributes to the release of microplastics, per- and poly-fluoroalkyl substances (“PFAS”), and organic contaminants into nearby waterbodies.⁴ These pollutants are perilous to the natural aquatic environment, can bioaccumulate, and severely threaten the health of fish.⁵

CRWA recognizes the heavy demand for recreational facilities and the desirability of a low-maintenance, affordable natural turf alternative. However, available scientific studies

¹ Jastifer, James et al., *Synthetic Turf: History, Design, Maintenance, and Athlete Safety*, 11 *Sports Health*, p 84-90 (Jan 2019). <https://doi.org/10.1177%2F1941738118793378>.

² Murphy, Maire and Warner, Genoa R., *Health impacts of artificial turf: Toxicity studies, challenges, and future directions*, 310 *Environmental Pollution* 119841, p 2-3 (Oct. 2022).

³ Gomes, F. O., Rocha, M. R., Alves, A. & Ratola, N. *A review of potentially harmful chemicals in crumb rubber used in synthetic football pitches*. *J. Hazard. Mater.* 409, 124998 (2021). Analysis by Public Employees for Environmental Responsibility found that “PFOS is found in roughly three-quarters of all artificial turf tested.” *Test results for preliminary study PFOS on hands of soccer players and coaches on artificial turf vs grass*, PEER (2024). https://peer.org/wp-content/uploads/2024/03/3_6_2024-Dermal-absorption-PFAS-AT.pdf.

⁴ Connecticut Department of Environmental Protection, *Final Report - Artificial Turf Study - Leachate and Stormwater Characteristics* (July 2010); Galkina, Elena, *Possible Impact of Additives in Artificial Turf on Aquatic Life in the San Francisco Estuary*, 1509, p 20-21, Master’s Projects and Capstones, University of San Francisco (May 2023); see also Murphy and Warner *supra* note 1.

⁵ Tian, Zhenyu et al., *A ubiquitous tire rubber-derived chemical induces acute mortality in coho salmon*, 371 *Science* 6525, 185-89 (2020); see also Stokstad, Erik, *Common tire chemical implicated in mysterious deaths of at-risk salmon*, *Science* (Dec. 3, 2020), <https://www.science.org/content/article/common-tire-chemical-implicated-mysterious-deaths-risk-salmon>; de Haan, W. P. et al. *The dark side of artificial greening: Plastic turfs as widespread pollutants of aquatic environments*, *Environ. Pollut.* 334, 122094 (2023).



indicate that artificial turf may not be cost-effective in the long term and that it may have significant deleterious human health effects.⁶ Crucially, artificial turf does not provide the same environmental benefits as grass athletic fields. Unlike natural grass fields, artificial turf constitutes an impervious surface, generating additional stormwater runoff which contributes to flooding and aquatic contamination.⁷ Studies show that artificial turf also exacerbates heat island effects.⁸ Artificial turf provides none of the air or water quality benefits of natural turf, nor does it provide potential habitat or ecosystem benefits.

Given the impacts of artificial turf installation, CRWA recommends that it not be used as part of municipal or private projects. Federal and state law has yet to fully regulate the use of artificial turf, and litigation over its ill effects has been inconclusive and sparse, though there are municipal and state efforts to limit its use in Massachusetts. As of March 2024, three bills before the Massachusetts state legislature relate to artificial turf. Boston has pledged not to use artificial turf on municipal properties, and state Community Preservation Act program funds may not be used for artificial turf. As the conversation around artificial turf usage advances, CRWA strongly advocates for legislation and policy that reduces artificial turf's ability to negatively impact the Commonwealth and its waters.

For additional information, studies, and discourse surrounding artificial turf, CRWA recommends the resources provided below:

[Athletic Playing Fields - Toxics Use Reduction Institute](#)

[Athletic Playing Fields – Lowell Center for Sustainable Production](#)

[Northeastern University: PFAS Project Lab](#)

- [PFAS Governance Tracker](#)

⁶ Swiss Chemicals Agency (Keml, 2006) (recommended banning the use of recycled tires for new artificial turf fields despite low risk level); Marsili et al., (2014) (public use of artificial turf fields is unsafe due to the wide variety of harmful chemicals emitted when the infill material is heated).

⁷ Thomas J. Simpson, Robert A. Francis, *Artificial lawns exhibit increased runoff and decreased water retention compared to living lawns following controlled rainfall experiments*, Urban Forestry & Urban Greening, Volume 63, 2021, <https://doi.org/10.1016/j.ufug.2021.127232>.

⁸ Myrick, Sonia, *Synthetic Sports Fields and the Heat Island Effect*, National Recreation and Park Association, [Parks and Recreation](#), (May 8, 2019), <https://www.nrpa.org/parks-recreation-magazine/2019/may/synthetic-sports-fields-and-the-heat-island-effect/>

- PFAS Project Lab Fact Sheet - [PFAS in Artificial Turf Fields: Uncertainties and Cause for Concern](#)

Studies/Reports

- [de Haan, W. P. et al. The dark side of artificial greening: Plastic turfs as widespread pollutants of aquatic environments. *Environ. Pollut.* **334**, 122094 \(2023\)](#)
- [Gomes, F. O., Rocha, M. R., Alves, A. & Ratola, N. A review of potentially harmful chemicals in crumb rubber used in synthetic football pitches. *J. Hazard. Mater.* **409**, 124998 \(2021\)](#)
- Naim, Ayman, *An Investigation into PFAS in Artificial Turf Around Stockholm (Sweden)*, University of Stockholm; Zuccaro et al., *Artificial turf and crumb rubber infill: An international policy review concerning the current state of regulations*, Environmental Challenges (Sept. 2022).
- Pochron et al., *The response of earthworms (Eisenia fetida) and soil microbes to the crumb rubber material used in artificial turf fields*, 173 Chemosphere 557-562 (Apr. 2017)
- United States Environmental Protection Agency, *Federal Research on Recycled Tire Crumb Used on Playing Fields*, <https://www.epa.gov/chemical-research/federal-research-recycled-tire-crumb-used-playin-g-fields>.
- Perkins et al., *Evaluation of potential carcinogenicity of organic chemicals in synthetic turf crumb rubber*, 169 Environmental Research 163-172 (Feb. 2019).
- Toxics Use Reduction Institute, *Per- and Poly-fluoroalkyl Substances (PFAS) in Artificial Turf Carpet* (Feb. 2020) https://www.turi.org/var/plain_site/storage/original/application/2af7f525abb175811f54b1dfb8ccc5c8.pdf
- Li, Ran, *Tracking Microplastics From Artificial Football Fields to Stormwater Systems*, Department of Physical Geography, Stockholm University (2019).
-

Articles

- Harry Sawyers and Gregory Han, *Why We Don't Recommend Artificial Grass for Most People*, [The New York Times - Wirecutter](https://www.nytimes.com/wirecutter/reviews/best-artificial-grass/#environmental-and-health-impacts-of-synthetic-turf) (July 9, 2021), <https://www.nytimes.com/wirecutter/reviews/best-artificial-grass/#environmental-and-health-impacts-of-synthetic-turf>.



July 5, 2023

Subject: No new artificial turf, and organic infill on existing fields

Dear City of Newton:

The Massachusetts Chapter of the Sierra Club has been leading efforts to address the interrelated issues of climate change, toxics and plastic pollution.

The Sierra Club was founded to promote outdoor activities in nature. However, we do not support the growing trend to install artificial turf athletic fields and related synthetic surfaces. **We oppose the installation of artificial turf at Albemarle.** We recognize the challenges of maintaining natural grass fields but they are the only sustainable option.

First, we can't keep fossil fuels in the ground if we keep using them for plastics and other petrochemicals. Second, synthetic plastic are much hotter than grass (by up to 50°) regardless of the infill, and will create a *heat island* for the athletes and the neighborhood. Heat island exacerbates the climate and health impacts of our hotter, drier summers. Plastic turf can cause skin burns and heat-related illnesses.

Each full-size field removes over two acres of ecosystem that sequesters carbon, and covers it with plastic. This will result in a loss of habitat for birds, small mammals, insects, earthworms, etc. Plastic turf is unsanitary (e.g., MRSA and animal wastes) and often requires sanitization with chemical biocides, which are not needed for grass, and would further degrade the surrounding habitat.

An artificial turf field consists of a large number of undocumented mixtures of petrochemical plastics and chemicals of varying toxicity. Underneath the plastic carpet are typically a plastic shock pad, a geotextile and drainage system. All plastics and other petrochemicals are toxic throughout their entire lifecycle from oil and gas extraction to product disposal.

A variety of toxic PFAS chemicals have been discovered in major components of turf fields from many companies. The synthetic plastic grass blades are made in part with fluoropolymers, which share the same chemistry as PFAS and are often included in that definition. Brock Hill was surprisingly found to have PFAS when tested for Martha's Vineyard High School. *PFAS is so problematic that this should be reason enough to reject all artificial turf.*

Plastic surfaces generate non-biodegradable microplastics through abrasion and ultraviolet radiation. Chemical leachate is also a concern for plastic turf because so much of the plastic is in direct contact with the underlying soil. Rainwater and any irrigation will wash chemicals and microplastics into the soil, groundwater, and the storm system. Microparticles and leachate can be ingested by aquatic animals and enter the human food chain. Wind will blow plastic microparticle dust onto people and the surrounding area. Athletes, coaches and groundskeepers will be the most heavily exposed.



A synthetic field will eventually become over 100 tons of bulky solid waste. Plastic recycling is not working for food packaging, and is infeasible for artificial turf due to its size, mixtures and toxicity. Films like synthetic blades and foams in underlayment are always extremely problematic to recycle. Pipes for drainage are likewise cumbersome to recycle. Recycling does not make synthetic surfaces “sustainable” since the raw materials are petrochemicals. The new, so-called “advanced recycling” merely renders selected components back to basic synthetic petrochemicals while the process creates additional pollution from toxic by-products.

If the artificial turf is replaced at Newton South High School, the Sierra Club recommends avoiding tons of toxic petrochemical rubber (TPE) as the infill. Only **organic infills** should be used as is being done in other communities such as your neighbor, Brookline.

Several other communities including Andover, Brookline, Springfield, Swampscott, Newburyport, Methuen and Wayland have rejected artificial turf fields or imposed a moratorium. The continued conversion of grass to artificial turf is inconsistent with Newton’s leadership in avoiding unnecessary plastics shown by its strong ordinances over many years. We urge the City to carefully consider the significant long-range negative environmental and health impacts of artificial turf.

Respectfully,

Vickash Mohanka
Massachusetts Sierra Club, Acting Chapter Director
vick.mohanka@sierraclub.org