Town of Arlington
Department of Health and Human Services
Office of the Board of Health
27 Maple Street
Arlington, MA 02476

Tel: (781) 316-3170
Fax: (781) 316-3175

Artificial Turf Study Committee Agenda
03/19/24

Meeting Date: March 19, 2024
Meeting Time: 5PM-6:30PM
Location: Zoom- Registration link:
https://town-arlington-ma-us.zoom.us/meeting/register/tZAvcuqoqTssHt1BnuSXOpbXEnysRzAC-LUe

Objectives:

1) To discuss potential recommendations/conclusions based on the narrative reports.
2) To discuss project timeline, deliverables, working group narratives, and details of draft report.

Agenda

I. Acceptance of Meeting Minutes: March 12, 2024
II. Correspondence Received
III. Discussion: Recommendations/Conclusions
IV. Discussion: Project Timeline, Deliverables, Working Group Narratives, Draft Report
V. New Business
VI. Adjourn

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Artificial Turf Study Committee Meeting Minutes

Meeting Date: March 12, 2024
Meeting Time: 5PM-6:30PM
Location: Zoom- Registration link:
https://town-arlington-ma-us.zoom.us/meeting/register/tZAvcuqoqTssHt1BnuSXOpbXEnysRzAC-LUe

Objectives:

1) To discuss the narrative reports submitted by each working group.
2) To discuss potential recommendations/conclusions based on the narrative reports.

Committee Members present: James DiTullio, Chair; Natasha Waden, Clerk; Mike Gildesgame; Leslie Mayer; Joseph Barr; Jill Krajewski; Marvin Lewiton; Joseph Connelly; David Morgan

Agenda

I. Acceptance of Meeting Minutes

- Motion to approve meeting minutes from 02/20/2024 was made by Mike Gildegame.

  2nd by Marvin Lewiton.

  Vote:
  Mike Gildesgame, Yes
  Leslie Mayer, Yes
  Joseph Barr, Not present for vote
  Jill Krajewski, Yes
  Natasha Waden, Yes
  Marvin Lewiton, Yes
  James DiTullio, Yes

  Approved (6-0, with 1 not present for the Vote)

- Motion to approve meeting minutes from 02/27/2024 was made by Marvin Lewiton.

  2nd by Leslie Mayer.

Vote:
Mike Gildesgame, Yes
Leslie Mayer, Yes
Joseph Barr, Not present for vote
Jill Krajewski, Yes
Natasha Waden, Yes
Marvin Lewiton, Yes
James DiTullio, Yes

Approved (6-0, with 1 not present for the Vote)

II. Correspondence Received

Natasha Waden reported that the following correspondence was received:

1) An email from Beth Melofchick with a link to two videos:
    a. South Florida, We're All Plastic People Now.
    b. We the Guinea Pigs.
2) An email from Phil Lasker with a link to a large document titled: Information for Artificial Turf Committee.
    Natasha clarified that only the first 7 pages of the document were included due to its size, however, a link to the full document was provided in the packet to Committee Members and the public.
3) An email from Robin Bergman with a link to an article: Microplastics in Every Human Placenta.
4) An email from Mike Gildesgame with a link to a report from EPA: Requiring toxic release Inventory Reporting for 7 Additional PFAS.
5) Three Emails from Susan Chapnick with the following links:
    a. TURI Document: Building An Organic Maintenance Program for Athletic Fields
    b. A study about Engineered Green Infrastructure to reduce 6PPD-quinone in Storm Water Runoff; and
    c. A Referendum from Newton, MA banning the purchase of PFAS containing material.

Jim DiTullio thanked the public for submitting correspondence. Additionally, he reminded everyone that to comply with Open Meeting Law requirements, any information received after the deadline (typically, Thursday evening's at 5pm, prior to a Tuesday meeting) would be included in the Committee's next meeting packet.

III. Discussion: Draft Working Group Narrative Sections

Jim DiTullio addressed the Committee and stated that for the most part the narratives were fairly consistent with each group's bullet points. DiTullio stated that the purpose of tonight's meeting would be for the Committee Members to discuss, defend, and present any questions or concerns about each of the working group's narrative reports. DiTullio mentioned at the conclusion of the discussion, he hopes to begin a discussion about potential recommendations/findings for the final report, as outlined in the Artificial Turf

Study Committee charge. DiTullio also explained that efforts to combine the three reports into one cohesive document are going to take a bit more time than originally anticipated; therefore the Committee can reasonably expect to see a draft on March 22, 2024. DiTullio suggested that instead of following the "report out" format (health, safety, environmental) for working group narrative reports that we have a less formal discussion that focuses on specific questions or concerns about the narratives.

A Member of the Environmental group commented on the Health and Safety reports stating that the narrative seemed to provide a very balanced view.

The Member also wanted to point out a commonality among the three reports in reference to testing and how it has changed since 2019 and is going to continue to change over time. As such, acknowledging and referencing future changes should be the focus in the report as opposed to trying to cite specific testing methods which may end up being outdated.

In response, a Member from the Safety group highlighted that a key component of the report should include identifying gaps in analysis and clarifying that any recommendations from this Committee are based off of a moment in time, which is spring 2024.

A Member from the Safety group raised concerns that the environmental report does not address or acknowledge the evolution of recycling that is currently happening with Artificial Turf. Additional conversation was had amongst members discussing that there does appear to be varying views on what "recycling" means. As such, it will be important to acknowledge this and explain that while some companies may be recycling artificial turf in some way; the extent of that recycling is unknown and at this time varies among manufactures. Another Member suggested that if the Town were to move forward with artificial turf field(s), that language be built into a contract(s) that requires an end of use recycling plan.

A Member from the Health group raised a concern about references made in the Environmental report in regards to the communities of Springfield and Marblehead, MA. The Member expressed concern and referenced Committee conversations in which Members have discussed comparable communities to Arlington; however, they did not include Springfield and Marblehead. A reference to the city of Malden had been mentioned by Members in previous meetings as being more comparable to Arlington, specifically as it pertains to the land space constraints related to green space. As such, multiple members believe examples should reference comparable communities that Members have agreed upon.

Multiple Members raised concerns about the closing recommendation in the Environmental narrative, particularly as it states new or reconstructed athletic fields should be constructed and maintained as organically managed natural grass rather than artificial turf fields. Members discussed that this was a bit surprising, as the statement did not seem to align with the views expressed in previous meetings by either Committee Members or the Environmental working group members. Members also referred to comments/discussions of mitigation measures in previous meetings such as recycling methods, requiring PFAS free material, and references to MIT's use of both types of fields and mitigation measures. However, these were not mentioned in the environmental narrative.

A Member of the Safety Committee raised concerns about the Wetlands Value Table that was submitted with the Environmental narrative. The Member pointed out that the chart compares artificial turf fields to natural organically managed grass fields. However, Arlington's grass fields are not currently organically maintained and therefore felt it is not a relative comparison. The Member was concerned that use of the table in its current form may give off an impression to the reader that Arlington's fields are organically maintained. As such, a recommendation was made that the chart should be reflective of how the current grass fields are managed.

A Member of the Environmental group clarified that their intent was to suggest that the grass fields should be organically maintained. The Member acknowledged that while the recycling of artificial turf is evolving, the current recycling practices do not seem to be meaningful. The group acknowledged the issue of comparability of communities to Arlington. Additional discussion was had amongst Members in regards to the importance of addressing the costs associated with the differing surfaces (natural vs artificial) and maintenance options (organic vs non-organic).

Another Member of the Environmental group pointed out that the Environmental narrative is a draft and only one piece of the study. While, their group identified that natural grass turf that is organically maintained may be the best for the environment; they understand the other reports (health and safety) would also be taken into consideration when discussing findings/recommendations in the final report. Additionally, the Member discussed fiscal challenges with balancing and understanding the constraints associated with both the operating and capital budgets. Whereas there is limited funding for existing critical town/school maintenance projects; costs and funding associated with field construction and maintenance is an important component that needs to be considered as well.

A Member of the Health group made reference to all three reports, stating that in reading the Health and Safety reports, they both seemed to have a balanced perspective in regards to artificial vs. natural turf, but that the environmental report seemed to reflect an anti-turf perspective. The Member wondered if this is what others thought and why there may be so many questions about the Environmental narrative report.

A Member of the Health group asked for clarification on the reference to toxic algae blooms and artificial turf fields. The Member referenced seasonal toxic algae bloom at Spy Pond and Monotony Rocks Park over the years, but noted that artificial turf fields are not in those areas. As such the Member wanted to understand the connection trying to be made by the environmental group. A Member of the Environmental group explained that toxic algae blooms are the result of runoff from fertilized lawns and fields that end up in the waterbodies, which allows for algae to bloom. When grass or shrubberies are removed, it prevents the ability for nutrients to be absorbed into the soil. As such, nutrients enter the waterbodies which may cause nutrient loading. The combination of increased nutrients and fertilizer in waterbodies may result in toxic algae blooms. A Member from the Health group commented that this example did not seem appropriate in reference to artificial turf, as one might say that by installing artificial turf and not applying fertilizer it may prevent a bloom. The Member was particularly concerned about the reference given Arlington's history of toxic algae blooms and the fact that there are no artificial turf areas in the vicinity of where

blooms have been identified. As such it was recommended that this reference be excluded from the final report.

A Member of the Safety group echoed the concerns about the Environmental narrative reflecting an anti-turf perspective. The Member recognized that perhaps this is the nature of the environmental findings, but mitigations measures such as considering PFAS free material and/or testing of materials prior to installation did not appear to be discussed in the narrative. The Member raised concerns about the reference to Mass DEP, considering language to define artificial turf as an impermeable surface, as it has not yet been finalized. The Member also raised concerns about the TURI statement at the end of the narrative, stating that despite its affiliation with the State; in his experience, TURI comes across as an anti-plastic/anti-turf organization and seems to overlook any potential benefits to the use of either.

Another Member from the Health group question how impactful the changes in fertilizer and nutrient load in waterbodies would be if a natural grass field that is fertilized and does not absorb water very well, is replaced with an artificial turf field that does not require fertilizer. The Member acknowledged that replacing a large meadow or forest with artificial turf would seem to her to be impactful; but did not agree that replacing a poorly maintained grass field with an artificial turf would be that impactful on the fertilizer and nutrient loads in waterbodies. The Member also referenced conversations had amongst the Committee in regards to the possibility/feasibility of forcing more natural landscaping around areas where artificial turf may be installed to help with absorption.

A Member from the Environmental group clarified that they are not aware of any research that demonstrates artificial turf is better in regards to abating or minimizing nutrient runoff. However, the member clarified that it requires a lot of area to infiltrate water and collect nutrients. As such, any amount of absorption that is taking place on a grass field will be more effective than on artificial turf surface. The environmental group was also not aware of any research that describes the size or type of mitigation needed to remove contaminants and nutrients from runoff associated with artificial turf fields. However, with Arlington's space limitations, it doesn't seem realistic to think that there would be adequate space to install a mitigation measure large enough, such as a wet meadow, near an artificial turf field.

The Environmental group also addressed comments about the anti-turf perspective mentioned by others in regards to the environmental narrative. The group clarified that similar to the other groups, they looked at all of the evidence. Whereas their task was to focus on environmental impacts, the evidence did not suggest a positive determination. The group also referenced that TURI's focus is the same as the Environmental group (to evaluate the environmental impacts), and in doing so they did not find any positive environmental effects of artificial turf to date.

A Member of the Safety group acknowledged the perspective outlined in the environmental group's narrative, but speculated that the research studies regarding environmental impacts of artificial turf may have been less neutral overall as compared to the other two groups (Health and Safety).

A Member of the Safety Committee asked a clarifying question in regards to artificial turf surface temperatures getting too hot and preventing wildlife from walking across it. The Member wondered if this was a relevant point, as it didn't seem likely that wildlife would be walking across either an artificial turf or grass field in the middle of a very hot day. Therefore, the Member was interested in whether or not the group had come across any research studies that discussed or showed evidence of this.

The Environmental group explained that the reference to wildlife and heat was a larger picture and intended to reflect how micro-organisms and other things that might live in the soil would be displaced by installing artificial turf. As such, this would have an effect on wildlife such as birds, squirrels, etc. as they would disappear from the area as a result of the lack of biodiversity to support them.

Another Member of the Safety group expressed concern that mitigation measures to capture runoff were not discussed in the environmental narrative. In her experience with the Recreation Commission, they have heard from industry that there are ways to address this, especially if they are considered during the design and building phase. One example given was the installation of chambers under a field to capture runoff. Additionally, the Member made reference to artificial turf being considered impermeable but stated that just as with infill materials, carpets are evolving and will likely change to be more permeable in the future.

The Environmental group responded that their intent was not to imply that there are no possible mitigation measures for storm water runoff; or to conclude that artificial turf is or is not a permeable surface. The section was meant to inform the reader of the direction the regulatory authority may be heading in the near future and explain that mitigation measures are possible; but fundamentally may not be considered permeable because the runoff does not infiltrate directly to the soil. The group also mentioned that the installation of chambers under a field is associated with more extreme flooding situations, not necessarily a typical field. Additionally, the cost of installing such mitigation measures is another factor that would need to be considered. The group acknowledged that it does seem that the industry is changing as far as permeability is concerned, but as mentioned previously by other Members, decisions should be based on what is currently known.

A Member of the Environmental group share that his overall opinion is that each project should be considered on a case by case basis. The Member questioned whether or not the Committee should/could make blanket recommendations or should/could provide information about issues that should be considered when making a decision about the surface of turf fields.

IV. Discussion: Recommendations/Conclusions

James DiTullio led the group discussion by stating that it did not appear that any group was in support of an outright moratorium on Artificial Turf fields. A couple of Members disagreed and expressed that the way the Environmental narrative reads, it seems that they are in support of a moratorium. Members of the Environmental group responded that their narrative is coming from strictly an environmental perspective. However, the group recognized that their narrative as well as the others (Health and Safety) is just a draft and

the assumption is that the narratives, as written, will likely change in the final document. The Environmental group also acknowledged that it was not their intent to provide their recommendation as the recommendation of the entire Committee. The group acknowledged that the report findings and recommendations will come from the entire Committee.

A Member of the Health group thanked the Environmental group for clarifying the position of their narrative and acknowledged that her initial reaction to it had been that of an anti-turf perspective. However, after hearing from the group tonight, it does not appear that that was the intent. The Member explained that it was just very surprising that mitigation measures were not really discussed in detail and there was such a strong recommendation for natural turf, mainly because this was not mentioned by the Environmental group in the weekly updates.

A Member of the Safety group wondered if the group could have looked at areas of Town to distinguish if there are specific areas/fields that may be more or less suitable for artificial turf fields. Additionally, the Member referenced examples from the communities of Malden and Brookline and wondered if any mitigation strategies identified in those communities that might be applicable in Arlington.

Upon completion of the discussion, DiTullio addressed the Committee by stating that it did not appear that anyone on the Committee was in support of a moratorium on artificial turf fields. All Committee Members agreed.

DiTullio initiated a conversation with the Committee to discuss the use of crumb rubber infill in future projects (this would not include ongoing projects or projects that have already been committed). While there seemed to be a general consensus among the Members, additional points were raised about the two existing artificial turf fields that utilize crumb rubber. Whereas, some Members had other meeting commitments, DiTullio decided in the interest of time to table this discussion until next week and move on to the next agenda item.

V. Discussion: Reports, Deliverables, Project Timeline

The Committee will plan to meet next week to continue the discussion about potential recommendations/findings that may be included in the final report. Some topics that will be discussed include but are not limited to the following: crumb rubber, PFAS free certifications, heat guidelines, age guidelines, recycling, irrigation, and other testing.

A draft of the final report will most likely be ready and sent out for a first review to the Committee on March 22, 2024. The plan will be to discuss the draft on March 26, 2024.

The Chair and Clerk will be submitting a letter to the Select Board requesting an extension from the requirement to submit the report within 30 days of the start of Town Meeting. As explained, the Committee does not believe it needs a long extension to complete the work, just a couple of extra weeks to draft the report, review with the Committee, revise, hold a public input meeting, and then finalize and submit the report.

Natasha Waden reminded the Members and public that the Committee would continue to accept comments up until the report has been completed and approved by the Members.

DiTullio reminded Committee Members to submit their references/citations to Natasha, regardless of whether or not they have been cited.

VI. New Business

There was no new business discussed.

VII. Adjourn

Motion to adjourn was made by Natasha Waden.

2nd by Leslie Mayer.

Vote:

Mike Gildesgame, (not present for vote)
Leslie Mayer, Yes
Joseph Barr, Yes
Jill Krajewski, Yes
Natasha Waden, Yes
Marvin Lewiton, Yes
James DiTullio, Yes

Approved (6-0, with 1 not present for the vote)

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ARTIFICIAL TURF COMMITTEE MEETING COMMENTS FROM THE CHAT

Date: March 12, 2024
Time: 5PM
Location: Remote Participation

Susan Chapnick

39:27

SC

MassDEP defined artificial turf as impervious surface in the State Draft Wetlands Regulations posted in December 2023.

Susan Chapnick

41:30

SC

I respect the committee members' discussion points and maybe the Environmental subcommittee could consider adding natural fields that are routinely maintained to the Table and the discussion points to round out the evaluation

Grant

47:25

G

The recommendation will be some compromises. Is my Ford Fusion environmentally positive? It generates used tires, brake pad dust, CO2, leaking oil/coolant over time. Probably not. But its an absolute necessity for other reasons, reasons we have created due to how we've planned our commuity

Susan Chapnick

01:00:13

SC

If the Committee feels it is relevant, I would like to know the committee's views on the Brookline report - since they went through a similar process as Arlington on evaluating artificial turf fields and recommendations to their town.

Susan Stamps

01:24:49

1

SS

Based on the findings so far, can the planned renovation of an existing turf field that Leslie just mentioned be delayed and at least another fill considered?

Lauren Doneski

01:25:37

LD

As a member of the community, I've been following along this whole study. I work for a turf company - TenCate (GeoSurfaces NorthEast - Woburn, MA) we are part of the largest turf manufacturer in the world – we did Skyline Park in Brookline & six fields in Waltham this past summer just to name some local references, with many more on the schedule for this year as well. Yes, we recycle with our Exxon Mobil & Cyclyx partnership. All of our products are PFAS-free.
https://recyclingisreal.com/
https://turfrecycling.us/
https://playingforkeeps.info/
https://tencategrass.com/
As a resident, I had to at least provide some info from the perspective I live every day.
No need for a response here but my info is below if you'd like to discuss further.
Happy to advise or provide resources for all parties.
Thanks for your time – this is a challenging conversation in a lot of communities, you are handling it well.
Lauren Doneski
Director of Business Development - Northeast
L.doneski@geosurfaces.com

Joseph Barr

01:27:24

JB

April 24 (delayed to Wednesday due to Passover)

Zoom1 Town of Arlington

01:30:02

ZT

Thanks Everyone, I need to set up for Park Commission

Susan Stamps

01:34:00

SS

Thank you all

Plastic Found Inside More Than 50% of Plaques From Clogged Arteries : ScienceAlert

Robin Bergman <robinorig@gmail.com>

Fri 3/8/2024 10:09 PM

To:Jim DiTullio <james_ditullio@hotmail.com>;Natasha Waden <nwaden@town.arlington.ma.us>

Jim, Natasha,

Please also add this article to the correspondence to the artificial turf study committee as well.

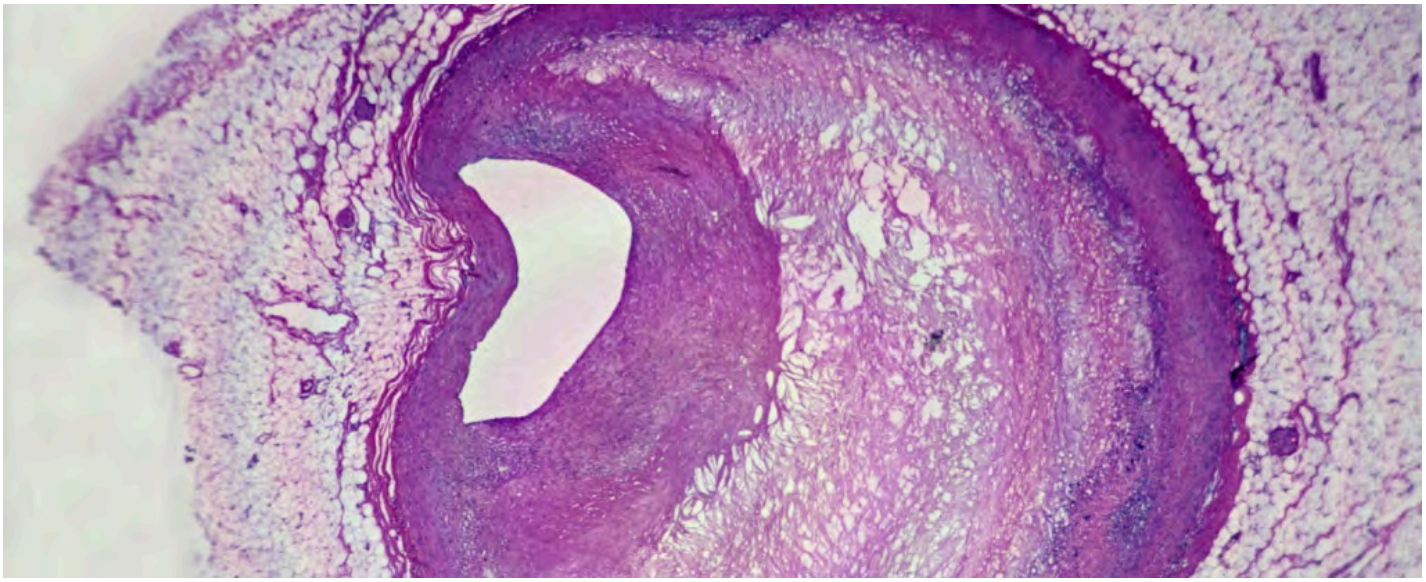
https://www.sciencealert.com/plastic-found-inside-more-than-50-of-plaques-from-clogged-arteries

"Now, a small study in Italy has found shards of microplastics in fatty deposits surgically removed from patients who had an operation to open up their clogged arteries – and reported their health outcomes nearly 3 years later."

Best,
Robin Bergman
Town Meeting Member, P12

Plastic Found Inside More Than 50% of Plaques From Clogged Arteries

HEALTH 07 March 2024 By CLARE WATSON



Cross section of a clogged coronary artery. (Ed Reschke/Getty Images)

Plastics are now everywhere, with tiny fragments found in several major organs of the human body, including the placenta.

Given how easily the microscopic particles infiltrate our tissues, it's vital that we learn exactly what kinds of risks they could pose to our health.

Researchers have been busy studying the effects of microplastics in mini-replicas of organs, and in mice, to get a sense of how they might impact the human body. However, the concentrations of microplastics used in those studies might not reflect people's real-world exposure, and few studies have been done in humans.

Now, a small study in Italy has found shards of microplastics in fatty deposits surgically removed from patients who had an operation to open up their clogged arteries – and reported their health outcomes nearly 3 years later.

Removing fatty plaques from narrowed arteries in a procedure called a carotid endarterectomy reduces the risk of future strokes.

The team behind this new study, led by Raffaele Marfella, a medical researcher at the University of Campania in Naples, wondered how the risk of stroke – as well as heart attacks and death – compared between patients who had microplastics in their plaques and those who did not.

Following 257 patients for 34 months, the researchers found nearly 60 percent of them had measurable amounts of polyethylene in plaques pulled from their fat-thickened arteries, and 12 percent also had polyvinyl chloride (PVC) in extracted fat deposits.

PVC comes in both rigid and flexible forms, and is used to make water pipes, plastic bottles, flooring, and packaging. Polyethylene is the most commonly produced plastic, used for plastic bags, films, and bottles, too.

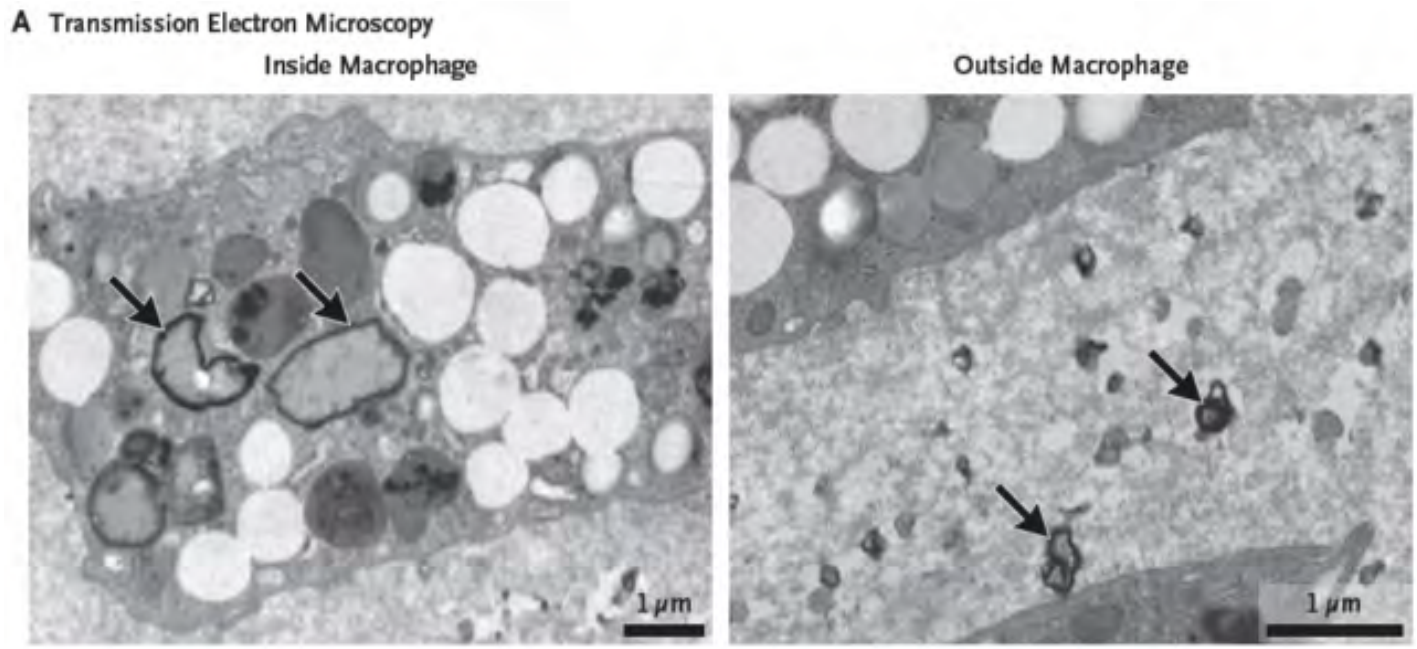
With microplastics previously found coursing through people's bloodstream, the researchers were reasonably concerned about heart health. Lab-based studies suggest microplastics can trigger inflammation and oxidative stress in heart cells, and impair heart function, alter heart rate, and cause scarring of the heart in animals such as mice.

"Observational data from occupational-exposure studies [also] suggest an increased risk of cardiovascular disease among persons who are exposed to plastics-related pollution, including polyvinyl chloride, than that seen in the general population," Marfella and colleagues write.

In the study, patients with microplastics in their excised plaques were 4.5 times as likely to have experienced a stroke, non-fatal heart attack or died from any cause after 34 months than people who had no detectable microplastics in the plaques that surgeons had removed.

The amount of microplastics, and even smaller particles called nanoplastics, was measured using a technique called pyrolysis–gas chromatography–mass spectrometry, and their presence confirmed using another method, stable isotopes analysis, which can distinguish between the carbon of human tissues and that of plastics made from petrochemicals.

Microplastics were also visible under powerful microscopes: The researchers observed plastic fragments with jagged edges inside immune cells called macrophages, and within the fatty plaques. Examining the tissue samples, the team also found higher levels of inflammatory markers in patients with microplastics in their plaques.



Jagged plastic particles were seen inside macrophages and deposits of fatty tissue, removed from clogged arteries. (Marfella et al., *NEJM*, 2024)

Bear in mind, however, that an observational study like this can't definitively conclude that microplastics are causing the downstream heart effects; only that there is an association. The study did not consider other risk factors for cardiovascular disease, such as smoking, physical inactivity, and air pollution.

"Although we do not know what other exposures may have contributed to the adverse outcomes among patients in this study, the finding of microplastics and nanoplastics in plaque tissue is itself a breakthrough discovery that raises a series of urgent questions," such as how to reduce exposure, writes pediatrician, public health physician and epidemiologist Philip J. Landrigan, of Boston College, in an accompanying editorial.

Plastic production has exploded in the past two decades, only a fraction of which has been recycled, and yet rates of cardiovascular disease have been falling in some parts of the world, so more research is needed to understand the link between the two.

The study has been published in the *New England Journal of Medicine*.

How PFAS, microplastics join forces as a synergistic threat | Forum | bayjournal.com

Robin Bergman <robinorig@gmail.com>

Fri 3/8/2024 10:00 PM

To:Jim DiTullio <james_ditullio@hotmail.com>;Natasha Waden <nwaden@town.arlington.ma.us>

Jim & Natasha,

Please add this article to the correspondence for the artificial turf study committee.

https://www.bayjournal.com/opinion/forum/how-pfas-microplastics-join-forces-as-a-synergistic-threat/article_634b24b6-d25e-11ee-adc1-d7d52920fb27.html

"Microplastics, another apparently ubiquitous pollutant, are interlinked with PFAS, amplifying contamination. In 2020, researchers in Illinois and Michigan studied the interaction of PFAS and microplastics in lake water and concluded that PFAS adsorption (adherence) was common in three widely used types of plastic: polypropylene, polyethylene and polyester. “Given the prevalence of PFAS and microplastics in natural waters, coupled with the extremely long persistence time of both classes of pollutants,” the team reported, “these two groups of emerging contaminants may act synergistically in food webs to cause adverse effects in fish and wildlife, as well as humans.”
And it’s now abundantly clear that microplastics are in all of our waters."

Best,
Robin Bergman
Town Meeting Member, P12

Bergman Email 2_attachment 2

https://www.bayjournal.com/opinion/forum/how-pfas-microplastics-join-forces-as-a-synergistic-threat/article_634b24b6-d25e-11ee-adc1-d7d52920fb27.html

How PFAS, microplastics join forces as a synergistic threat

Tamela Trussell

Mar 7, 2024

A study by the U.S. Geological Survey found PFAS, often called "forever chemicals," in 45% of drinking water systems studied.

Dave Harp

The prevalence and pervasive nature of per- and polyfluoroalkyl substances (PFAS) in our waterways are alarming. A study by the U.S. Geological Survey (USGS) and the Pennsylvania Department of Environmental Protection, published in August *Science of the Total Environment,* found that 76% of rivers and streams tested in Pennsylvania contained PFAS — highly toxic chemicals that pose severe health and environmental risks.

With nearly 15,000 variations, according to the U.S. Environmental Protection Agency, these substances, often referred to as "forever chemicals," bioaccumulate in fish and animals and persist in the environment, leading to widespread contamination across various sectors, including industry, consumer products and even the water cycle itself.

PFAS contamination stems from a dizzying array of sources, including industrial production, firefighting foam, plastics manufacturing, electronics, mining, agriculture, and wastewater. Their ubiquitous presence in everyday items, from cookware to clothing, ties them intricately to the life cycle of plastics. Moreover, studies indicate that PFAS are found in the environment, wildlife and human blood, with alarming health implications.

The maximum safe levels of these chemicals are extremely low, with the EPA setting health advisories at minute concentrations — in some cases less than 1 part per trillion — emphasizing their potent dangers. Eliminating existing contamination would be extraordinarily impractical,

so identifying the sources of contamination is critical to tackling the problem.

Another USGS study showed that 45% of drinking water contains one or more PFAS. Researchers with the New Jersey Department of Environmental Protection found that four polyfluoroalkyl substances, in particular, showed up in all of the samples taken from 11 rivers around the state.

Wildlife studies reveal the presence of PFAS in various species, highlighting the extensive reach of these contaminants across ecosystems. The Environmental Working Group, a national public health watchdog, analyzed more than 200 recent peer-reviewed studies and concluded that PFAS were found in more than 600 wildlife species worldwide. "It is urgent that ongoing releases of PFAS be identified," said David Andrews, an EWG senior scientist.

These microplastics from the Corsica River in Maryland were photographed at a laboratory at the University of Maryland's Department of Environmental Science & Technology.

Will Parson/Chesapeake Bay Program

Microplastics, another apparently ubiquitous pollutant, are interlinked with PFAS, amplifying contamination. In 2020, researchers in Illinois and Michigan studied the interaction of PFAS and microplastics in lake water and concluded that PFAS adsorption (adherence) was common in three widely used types of plastic: polypropylene, polyethylene and polyester. "Given the prevalence of PFAS and microplastics in natural waters, coupled with the extremely long persistence time of both classes of pollutants," the team reported, "these two groups of emerging contaminants may act synergistically in food webs to cause adverse effects in fish and wildlife, as well as humans."

And it's now abundantly clear that microplastics are in all of our waters. Studies in Pennsylvania's streams and rivers, even those deemed ecologically valuable, show high rates of microplastic pollution. A 2015–19 study of microplastics in a 200-mile stretch of the Delaware River by the USGS and National Park Service found microplastic fragments, mostly in the form of fiber, in 100% of the water and sediment samples and 94% of the fish.

The issue expands beyond water bodies.

Farmlands and wastewater treatment plants contribute to the problem. Biosolids, a fertilizer byproduct of sewage treatment, are a potential carrier of PFAS, impacting agricultural lands and, subsequently, the food supply. The lack of comprehensive testing methods and standards for PFAS

in biosolids poses a significant challenge.

There are 516 major sewage plants in the Chesapeake Bay region. A study found that each plant releases an average of 4 million microplastic particles daily. Biosolids are created from processing municipal sewage. Many known or suspected PFAS contamination sites in Pennsylvania are located near the state's 51 sewage treatment plant. The EPA and Pennsylvania's DEP permit six of them to produce biosolids for land application.

Many Pennsylvania farms have been contaminated by the spreading of biosolids since 1989. Biosolids have also been used in mine land reclamation projects around the state — an estimated 750,000 tons of it, covering about 4,500 acres. Farms also become contaminated with PFAS from microplastics and the application of pesticides, herbicides and fungicides. Introducing microplastics and PFAS into our soil creates a vicious cycle of food contamination. Even organic farmers are devastated by legacy applications of sludge laced with PFAS.

PFAS have been found in hay, tree fruit and more.

Urban and industrial areas are not immune to contamination. Current and legacy sites, like landfills and manufacturing facilities, are identified as primary contributors of PFAS and other toxic chemicals and microplastics. The challenge lies not only in identifying these sources but also in regulating and remediating them effectively.

More research is needed to assess the contamination and its impact on wildlife and human health, and it is essential to identify areas less affected for comparative studies. As the evidence grows, it becomes clear that PFAS represent an unavoidable and hazardous chemical class that threatens ecosystems, human health and the environment.

Addressing this issue requires a multi-faceted approach: manufacturing and disposal regulations, responsible waste management, developing alternatives — and holding producers accountable for testing, monitoring and remediation.

And it requires immediate action at both regulatory and industrial levels.

Awareness, stringent monitoring and proactive measures to limit PFAS use are imperative for safeguarding all life forms from their silent but destructive impact.

Tamela Trussell is the founder and president of Move Past Plastic, based in Carlisle, PA.

The views expressed by opinion columnists are not necessarily those of the Bay Journal.

Fw: Turf

Beth Melofchik <tankmadel@yahoo.com>

Tue 3/12/2024 11:46 AM

To:Natasha Waden <nwaden@town.arlington.ma.us>
Cc:James Ditullio <james_ditullio@hotmail.com>;Jordan Weinstein <jordan3weinstein@gmail.com>;Wynelle Evans <evco7@rcn.com>;Robin Bergman <robinorig@gmail.com>

Hi Natasha,

Please include in correspondence for entire committee and the record.

Thank you

Beth Melofchik

----- Forwarded Message -----
From: Beth Melofchik <tankmadel@yahoo.com>
To: James Ditullio <james_ditullio@hotmail.com>
Cc: Robin Bergman <robinorig@gmail.com>; Jordan Weinstein <jordan3weinstein@gmail.com>; Wynelle Evans <evco7@rcn.com>
Sent: Tuesday, March 12, 2024 at 10:58:14 AM EDT
Subject: Fw: Turf

Jim,

Please note many of the scientists cited in the article below GreenArlingtonMA worked with to understand the ramifications of chemicals in artificial turf.

Of utmost concern is the effect of these chemicals on developing children's bodies, and on young women.

Endocrine disruptors are of particular concern.

See Letters and Forums on GreenArlingtonMA. Thank you

Green Arlington, MA

Green Arlington, MA
Mission of Green Arlington

Kind regards,
Beth Melofchik

----- Forwarded Message -----
From: Gilbert Martin <gibs@media.mit.edu>
To: tankmadel@yahoo.com <tankmadel@yahoo.com>
Sent: Tuesday, March 12, 2024 at 10:43:28 AM EDT
Subject: Turf

<https://www.washingtonpost.com/wellness/2024/03/12/artificial-turf-pfas-chemicals/

Turf fields may have ‘forever chemicals.’ Should kids be playing on them?

By Teddy Amenabar
March 12, 2024 at 7:00 a.m. EDT

Children run drills during a soccer practice in San Diego on Nov. 12. (Sandy Huffaker for The Washington Post)
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The three 6-year-old girls stood on the sidelines as their coach swabbed their hands. Then they ran onto a lush green turf field and played soccer for 90 minutes straight — no stepping off the pitch. This wasn’t just a practice. It was part of a small experiment conducted in the suburban foothills of San Diego last summer.

Salar Parvini, 44, the children’s assistant soccer coach, swabbed his hands too, and shipped the samples taken before and after the practice to a lab in Lancaster, Pa. There, scientists would test them for “forever chemicals,” also known as PFAS, a broad class of man-made chemicals linked with a variety of health concerns, from high cholesterol to cancer.

Parvini and his players, all members of the San Diego Surf soccer club, are among the earliest test subjects in emerging research focused on whether the PFAS in artificial turf pose a meaningful health risk, especially to children, whose developing bodies are particularly susceptible to toxic chemicals.

Debates about artificial turf are happening at school boards, city council meetings and town halls in Massachusetts, New Jersey, Pennsylvania, New Hampshire, California and other states. On one side are some scientists and turf critics who say the presence of PFAS in turf is worrisome, given what is already known about the toxic effects of the chemicals.

But turf advocates and other scientists say there’s no reliable evidence showing that PFAS in turf pose a risk. Proponents also say the synthetic fields require less water than grass, don’t need pesticides and allow for more frequent competitive play, without the potholes or mud pits that need tending to on natural fields.

Salar Parvini and his daughter Emma at soccer practice. Concerned over PFAS, Parvini tries to limit his daughter’s playing time on turf. (Sandy Huffaker for The Washington Post)

PFAS — which stands for per- and polyfluoroalkyl substances — are used in a vast variety of products and have been dubbed “forever chemicals” because of their ability to persist in the environment for years. They keep food from sticking to pans, make raincoats and backpacks water-repellent and help carpets resist stains. And they can also be used to manufacture the plastic blades of grass in artificial turf.

Test results from the San Diego soccer kids experiment found that two of the three players — including Parvini’s daughter, Emma — came off the turf field with higher amounts of PFAS on their hands than at the beginning of the practice. So did Parvini. When the players practiced on natural grass, the results were mixed: Two of them had a decrease in PFAS, while Parvini was found to have more PFAS on his hands. (The new soccer balls also had detectable amounts of PFAS before they were used on both fields.)

The San Diego experiment was funded by Public Employees for Environmental Responsibility (PEER), a nonprofit that advocates against the use of artificial turf. The data are far from conclusive, in part because PFAS are so pervasive. Tests from Martha’s Vineyard, Mass., found that samples of soil from athletic fields had comparable amounts of PFAS to those found in samples of turf. The tests were ordered by a landscape architecture firm that designs both grass and turf fields.

In an email, Melanie Taylor, the president and chief executive of the Synthetic Turf Council (STC), a trade association for the industry, pointed to the tests showing the presence of PFAS in soil. She said that companies are looking for a standardized testing method to guarantee their turf products aren’t made with PFAS.

“STC has worked with its members to ensure their products contain no intentionally added PFAS constituents,” Taylor said.

Now, academic researchers are conducting higher-quality studies to determine whether PFAS and other chemicals detected in turf samples can end up on athletes and pose a risk to their health.

“I don’t think there’s been nearly enough studies to know,” said Christopher Kassotis, an assistant professor in the Institute of Environmental Health Sciences at Wayne State University who is preparing to conduct a study on whether the chemicals found in turf can affect the endocrine system. “There’s very little work here on human exposure, and that’s certainly a piece of the puzzle when it comes to risk.”

Kyla Bennett, the lead researcher behind the tests in San Diego and the director of science policy for PEER, said the results are a “red flag,” and larger studies are needed.

But some parents aren’t waiting around for clearer answers. Parvini has lobbied for local school boards in California to use turf fields made without PFAS. In the meantime, he tries to limit his daughter’s playing time on artificial turf fields.

“If they want to use PFAS in microchips, great. My kid doesn’t eat microchips,” he said. “But if they want to use it in artificial turf and my kid is exposed to it 2,070 hours a year, well, what is that doing to her body?”

Concerns about turf and chemicals

Artificial turf fields are booming: According to the Synthetic Turf Council, there are about 18,000 turf fields in North America. An estimated 1,500 are installed every year.

To make turf, a plastic resin is heated and extruded through a machine into a yarn. Manufacturers use a lubricant to help with that extrusion process, Joe Fields, the chief executive of TenCate Grass Americas, a turf company in Dayton, Tenn., said in an email. These lubricants have contained trace amounts of PFAS in the past, he said.

Fields said TenCate eliminated PFAS from its manufacturing process to give its customers “complete peace of mind since there are many types of PFAS and much confusion around these various types of PFAS and their potential to effect people or the environment.”

The finished artificial fields have several layers, including an infill — often made of rubber as well as coconut fibers, cork, nutshells or sand — that’s sprinkled between the blades of artificial grass to ensure they don’t get matted down, according to Taylor of the STC.

Researchers and environmental advocacy groups say that years of abrasion from cleats, rain and radiation from the sun could release chemicals from the field, which could expose the athletes or wash off into the environment. But those concerns haven’t been studied widely.

“We still don’t know enough about the effect of weathering,” said Jonathan Benskin, a professor in the environmental science department at Stockholm University, who co-wrote a peer-reviewed study in 2022 that found signs of PFAS in artificial turf but concluded it didn’t pose an “imminent" risk. (The researchers were unable to extract the chemicals from the material in the lab.)

The PFAS debate is not the first time concerns have been raised about the safety and chemical exposure of playing on turf fields. Nearly a decade ago, a cluster of cancer cases in soccer goalies who played on turf led to questions about the composition of the rubber infill.

In 2019, a report from the Environmental Protection Agency found the presence of chemicals and a variety of metals, including lead, in rubber infill but did not determine that turf is a risk to human health. And there is an ongoing debate about whether turf fields pose a greater risk of foot and leg injuries to children and adults alike.

“We’ve always warned people that there are hazards of using artificial turf,” said Sarah Evans, an assistant professor of environmental medicine and public health at the Icahn School of Medicine at Mount Sinai in New York. “Natural grass is a safer alternative across the board.”

Supporters of artificial turf say the fields allow for more competitive play throughout the year. (Sandy Huffaker for The Washington Post)

The debate over artificial turf

In Martha’s Vineyard, plans to install an artificial turf field at the public high school resulted in a years-long legal battle. Critics, including some parents, were concerned PFAS could end up in the island’s aquifer.

Rebekah Thomson, a 46-year-old mother of three who lives in Martha’s Vineyard, co-founded Field Fund, a nonprofit that advocates against the installation of artificial turf. She has environmental and injury risk concerns about turf and also worries turf fields are much hotter than grass.

“Our children deserve better. They deserve to be on grass and soil,” she said. “They deserve to be on a safe surface for their bodies and for their future that’s not going to jeopardize the world they live in.”

But Chris Huntress, the president of Huntress Associates, the landscape architecture firm that ordered the soil testing done in Martha’s Vineyard, said he is not concerned about the level of PFAS found in the turf materials he uses in his projects.

“You can dislike turf for a whole lot of reasons. You can say that it’s hotter than natural grass, because it is,” Huntress said. “But you cannot dislike it for PFAS. Because the trace elements that we’re seeing are so small that they’re shown to not have an impact on human health or environmental health.”

Donald Herman, a retired physical education teacher who coached football at the high school in Martha’s Vineyard for 32 years, said teams need an artificial turf field that can handle football, soccer and lacrosse throughout the school year.

“If I thought grass could work here, for our school, I would support grass,” Herman said. “But it doesn’t work here. Not with the use it gets.”

Some states and local governments, such as New York, have taken action to limit the use of PFAS in turf. (Sandy Huffaker for The Washington Post)

The synthetic carpet in turf fields need to be replaced typically every eight years, said Taylor, of the Synthetic Turf Council. Some turf manufacturers have begun recycling programs, she said.

But rolls of old turf fields can wind up in landfills — and some scientists say the PFAS in the turf fields won’t easily break down over time.

“These are made to be pretty much indestructible,” said Ian Cousins, an environmental chemist and professor at Stockholm University. “They’re not natural materials. So, it’s not great that they entered the environment. But once they’re there, they’re not going to disappear.”

Paul Makishima, a resident of Milton, Mass., has expressed his concerns over an estimated $2.5 million project that would involve installing a turf field next to a brook near his home.

“We’re worrying about what it’s going to do to the wetlands, what it’s going to do to the brook and, potentially, to those of us who live around it,” said Makishima, who’s one of 10 neighbors appealing the town’s decision.

Concerns regarding artificial turf have spurred some states and local governments to take action: New York has banned the sale of artificial turf with PFAS, starting at the end of 2026. And bills prohibiting the purchase of new artificial turf fields in certain places, such as schools, have been introduced in Massachusetts and Vermont.

Some scientists say it will be difficult to make definitive conclusions about turf because PFAS are already so pervasive in the environment. (Sandy Huffaker/for The Washington Post)

Unraveling the science

Scientists say it is unclear whether the PFAS in artificial turf can be absorbed by the human body, either through the skin, the mouth or the nose, or because of a scraped knee or elbow. Studies are underway to provide a better understanding of the risks.

In his lab at the University of Notre Dame, Graham Peaslee, a physics professor who frequently tests for PFAS in everyday products, has overseen the study of artificial turf samples and said they have consistently found small amounts of PFAS in the materials tested. He is preparing to submit his lab's findings for publication in a peer-reviewed journal.

"It's not just the players that are of concern, it's the entire communities," he said.

Kids during baseball practice on an artificial turf field in San Diego. (Sandy Huffaker/for The Washington Post)

In Detroit, researchers at Wayne State University plan to conduct a version of the tests conducted in San Diego but with a larger set of athletes and a broader mandate — examining all potential chemicals from artificial turf fields. Kassotis, the lead researcher, wants to better understand if the chemicals can affect children's endocrine systems.

"When you start to have chemicals that can errantly activate or inhibit those pathways, particularly in early life, when those signaling processes are so critical, you can have lasting health effects in all sorts of areas," Kassotis said.

And the National Institute of Environmental Health Sciences is funding a five-year study focused on "the ingredients and the chemical composition of some of the fields," said Homero Harari, an assistant professor at the Icahn School of Medicine at Mount Sinai and the researcher behind the study.

Despite these efforts, some scientists say it will be difficult to make any definitive conclusions about turf because PFAS are already so pervasive in the environment.

"Once that turf is installed, you cannot unequivocally attribute any PFAS detected to the turf itself," said Elizabeth Denly, a chemist who leads the PFAS initiative for TRC, an environmental consulting firm. (Denly worked with the city of Portsmouth, N.H., to test samples of turf from the manufacturer.)

It's virtually impossible to analyze any product and not find some trace level of PFAS, Denly added.

Kassotis said he hopes that, in the next decade, researchers will have a better sense of potential human health risks from using artificial turf.

Jeff Gearhart, the research director at the Ecology Center, a nonprofit advocacy group based in Ann Arbor, Mich., is planning to conduct his own study weathering turf samples in the lab. Gearhart said we know enough about the environmental hazards to limit the use of these materials.

"We put these products out into the environment without truly understanding their fate," he said. "Unfortunately, scientists and public health advocates have to scramble and try to put the Genie back in the bottle on this."

Table for the Environmental subcommittee

Mike Gildesgame <mikeg125@gmail.com>

Tue 3/12/2024 1:05 PM

To:Natasha Waden <nwaden@town.arlington.ma.us>;James DiTullio <james_ditullio@hotmail.com>
Cc:David Morgan <dmorgan@town.arlington.ma.us>;Susan Chapnick <s.chapnick@comcast.net>

1 attachments (140 KB)

Wetland Values Table.pdf;

Hi Natasha.
I am attaching a pdf version of the Wetland Values table comparison of Organically Managed Natural Grass Fields vs. ATF that was sent with our report. It appears that the original table included in the packet was somehow changed in transmission (comments and superscripts were misplaced). Climate Resilience was inadvertently left off in the prior version, too.
Please circulate this version to the committee.
Thanks
Mike

Environmental Subgroup - Artificial Turf Study Committee
Wetland Values Table

Table Comparison: ***Protects the Wetland Value / Interest?***

Wetland Value / Interest[1]	Organically Managed Natural Grass Field[2]	Artificial Turf Field	Comment
Public or Private Water Supply	Not applicable	Not applicable	
Ground Water Supply	Yes	No	ATF: potential for leachate of harmful chemicals including PFAS, Metals, PAHs, phthalates
Flood Control	Yes - pervious	No - impervious	ATF: MassDEP definition of Impervious Surface in draft Wetlands Protection Act, Dec. 2023 specifically includes artificial turf
Erosion Control and Sedimentation Control	Maybe	Maybe	Dependent upon design of fields and controls during construction
Storm Damage Prevention	Maybe	Maybe	Dependent upon design of fields and stormwater management
Prevention of Pollution	Yes	No	ATF: potential for leachate of harmful chemicals including PFAS, Metals, PAHs, phthalates and migration of infill & weathered grass blades causing microplastic & macroplastic particulate pollution
Wildlife Protection	Yes	No	ATF: loss of habitat for insects other invertebrates; loss of foraging potential for birds and small mammals; loss of wildlife corridor connectivity causing disrupted wildlife habitats; excess heat effects
Plant or Wildlife Habitat	Yes	No	
Aquatic Species and their habitats	Yes	No	ATF: leachate / surface water runoff of harmful chemicals including 6ppd-quinone, which is toxic to some freshwater trout, and potential for PFAS (eco-toxic effects), Zinc (toxic to freshwater fish), PAHs (carcinogens / neurotoxins), phthalates (endocrine disrupters) and migration of infill & weathered grass blades causing microplastic & macroplastic particulate pollution - plastic pollution is harmful to aquatic organisms.
Natural Character or recreational values of the wetland resources	Yes	No	ATF: negatively impact the natural character of the wetlands by adding 80,000 sq ft of plastic in or near resource areas, including 200 tons of infill and 20 tons of turf carpet (Synthetic Turf Council reference). Furthermore, artificial turf replaces natural habitats, leading to a loss of plant and animal species diversity in the area. This can have cascading effects on the entire ecosystem.
Climate Change Resilience [Section 32, Arlington Wetlands Regulations, March 2023]	No initially; Yes - after field is established	No	Organic Field: increase in irrigation/water needs for first few years of organic natural grass establishment; after established, allows for infiltration of potential pollutants; allows for heat mitigation compared to ATF; allows for carbon sequestration; does not need to be wholly replaced ATF: heat stress negatively impacts habitat values, increased pollutant loads from surface runoff and infill particulate migration, loss of carbon sequestration as a climate resilience strategy due to removal of soil (15), limited useful lifespan (8-10 years) generates additional, recurrent installation impacts on the environment and the surrounding community.

[1] https://www.arlingtonma.gov/town-governance/laws-and-regulations/town-bylaws/title-v-regulations-upon-the-use-of-private-property#A8

[2] assume organic management does not use pesticides, herbicides, P-fertilizers