## Mount Greylock Athletic Facility Improvements

July 30th 2019









### Why Synthetic Turf?

- Safety
- Playability 24/7/365
- Consistency
- Maintenance/Value
- Water Conservation





# Concern About Recycled Rubber

#### Artificial Turf Fields in New England

- There are approximately 300 Synthetic Turf Fields in Massachusetts alone that utilize sand and recycle rubber as an infill
- There are another 200-300 more in New England states surrounding Massachusetts utilizing similar systems

### July 25<sup>th</sup> 2019 EPA Release of Part I

Synthetic Turf Field Recycled Tire Crumb Rubber Research Under the Federal Research Action Plan

Conclusions

- This part of the report communicates the research objectives, methods, results and findings for the tire crumb rubber characterization (what is in the material) and fills specific data gaps about what chemicals are found in recycled tire crumb rubber used on synthetic turf fields.
- As expected, a range of chemicals was found in the recycled tire crumb rubber, including metals and organic chemicals. Where comparative data are available concentrations of most metal and organic chemicals found in tire crumb rubber were found to be similar when comparing this study to previous studies. Further, the emissions of many organic chemicals into air were typically found to be below detection limits or test chamber background, and releases of metals into simulated biological fluids were very low (mean bioaccessibility values averaged about 3% in gastric fluid and less than 1% in saliva and sweat plus sebum). Together, these findings support the premise that while many chemicals are present in the recycled tire crumb rubber, exposure may be limited based on what is released into air or biological fluids.
- Conclusions and Literature Review/Gap Analysis based on the review or evaluation of research conducted in 88 separate studies
- Continued research by state and federal government agencies continues with further findings expected in the 1-5 years.

#### **Optional Infill Alternatives**



Comparison of Synthetic Turf Infill Materials

#### Epidemiological Research

#### Questions

- Is there a difference in injury risk on synthetic turf and natural grass?
- Are there different types of injuries that occur on synthetic turf?



### Epidemiological Research

- ► Few studies Why?
  - Separate and Multiple contributors to injuries
    - Contact vs. Non contact
    - Shoe type
    - Weather Conditions
    - Who records data and types
    - Statistics- Larger sample sizes needed



The effect of these synthetic surfaces on injury rates has not been clearly established. The available literature is largely limited to football and soccer data and the majority of studies are short-term. Confounding variables such as climate, player position and footwear, as well as varying definitions of injury, also make it difficult to draw firm conclusions about the general effect of artificial playing surfaces on injury rates Many peer-reviewed studies cite a higher overall rate of injury on first- and second-generation

artificial turf surfaces compared with natural grass. Despite differences in injury type, the rate of injury on third-generation turf and natural grass surfaces appears to be comparable (Sports Medicine Vol. 10 November 2010)

### **Injury Studies**

Data from Penn State Center for Sports Surface Research

- 12 scientific injury studies published on infilled Synthetic Turf vs. Natural Grass (peer reviewed)
  - Soccer (9)
    - ► Europe
    - Profession and youth
    - Boys and Girls
    - ► Game vs. Practice
  - ► Football (2)
    - High School
    - College
  - Rugby (1)

- NO Study found a higher overall injury rate
- Ankle injuries some types are more common and some less common on synthetic turf

### **Injury Studies**

Data from Penn State Center for Sports Surface Research

- Synthetic Turf- Higher Incidence of ...
  - Zero-day time loss
  - Non Contact Injuries
  - Surface/epidermal injuries (abrasion)
  - Injuries during high temperatures

- ► Natural Grass Higher incidence of ...
  - Head and neural trama
  - Ligament Injuries
  - \*most injuries occurred on dry fields

#### Concussions

- 10-20% of concussions occur from impact with the playing surface
- High School Study- Shows higher concussion rate on natural grass



#### Field Use

- Physical Education
- ► Football
  - ► JV and Varsity
- Soccer
  - Boys JV and Varsity
  - ► Girls JV and Varsity
- Lacrosse
  - Boys JV and Varsity
  - ► Girls JV and Varsity

#### Consistency

- Field is usable in all seasons
- Properly drained, field is usable in all weather conditions
- Field synthetic turf provides a surface that is true and predictable for all athletes and sports. Specifically true for soccer and lacrosse
- Consistency of field surface improves overall quality of play.

## Return on Investment

#### Cost to Install

Natural Turf \$500,000 Synthetic Turf \$1,100,00

Difference \$600,000

#### Maintenance Costs

 Natural Grass Maintenance (Typical Game Field)

	Synthetic	Turf
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Mowing	\$15,000
Fertilizer	\$2,500
Aerify	\$1,500
Top Dressing	\$2,500
Sand Fill	\$1,000
Over-seeding	\$2,500
Field Painting	\$5,000
Irrigation Repair	\$6,000
Water	\$6,000
Total	\$42,000

Infill\$1,000Field Painting\$2,500Grooming\$3,500Seam Repair\$1,000

Total

\$8,000

#### Return on Investment

Cost Difference in Maintenance

Cost Difference at Installation

\$34,000 \$600,000

ROI

17.6 years

#### Life Cycle Costs

Natural Grass	Synthetic turf				
Cost New	\$500,000		Cost New		
10 yrs Maintenance	\$420,000		10 Yrs Maintenance		
10 Year Total	\$920,000		10 Year Total		
10 year Poplacement			10 Voor Poplacomont		

10 year Replacement\$500,00010 yrs Maintenance\$420,00020 Year Total\$1,840,000

10 Year Replacement\$455,00010 Years of Maintenance\$80,00020 Year Total\$1,715,000

\$1,100,000

\$1,180,000

\$80,000

Initial Capital	2	4	6	8	10	Replacement	12	14	16	18	20	Replacement	22	24	26	28	30
													\$2,424,0				
\$500,000	\$584,000	\$668,000	\$752,000	\$836,000	\$920,000	\$1,420,000	\$1,504,000	\$1,588,000	\$1,672,000	\$1,756,000	\$1,840,000	\$2,340,000	00	\$2,508,000	\$2,592,000	\$2,676,000	\$2,760,000
520	1040	2080	2600	3120	3640		4680	5720	6760	7800	8840		9880	10920	11960	13000	14040
\$961.54	\$561.54	\$321.15	\$289.23	\$267.95	\$252.75		\$321.37	\$277.62	\$247.34	\$225.13	\$208.14		\$245.34	\$229.67	\$216.72	\$205.85	\$196.58
\$1,100,0													\$2,186,0				
00	\$1,116,000	\$1,132,000	\$1,148,000	\$1,164,000	\$1,180,000	\$1,635,000	\$1,651,000	\$1,667,000	\$1,683,000	\$1,699,000	\$1,715,000	\$2,170,000	00	\$2,202,000	\$2,218,000	\$2,234,000	\$2,250,000
2250	4500	9000	13500	18000	22500		27000	31500	36000	40500	45000		49500	54000	55040	56080	57120
\$488.89	\$248.00	\$125.78	\$85.04	\$64.67	\$52.44		\$61.15	\$52.92	\$46.75	\$41.95	\$38.11		\$44.16	\$40.78	\$40.30	\$39.84	\$39.39

#### Athletic Field Costs Synthetic Turf vs. Natural Grass

