

November 6, 2020

Concord Natural Resources Commission  
141 Keyes Road  
Concord, MA 01742

**RE: Notice of Intent, Middlesex School, 1400 Lowell Road, DEP File #137-1545  
Comment Responses**

Dear Members of the Commission,

Below are responses to comments received by the Town regarding the above referenced project.

- C1. Clarify the anticipated recharge system within the field.
- a. Stormwater is being collected and discharged at two locations, and staff believes that a recharge system should be included, as was done for the Fenn School athletic field. CPW-Engineering is reviewing the Stormwater Management Report.

***R1. The purpose of a recharge system under Standard 3 of the Massachusetts Stormwater Standards is to compensate for natural recharge that is lost when a site is covered with impervious area. Under Standard 3, required recharge volume (Volume 1, Chapter 1, Page 6) is calculated by multiplying inches of runoff by impervious area. We are not adding any new impervious area to the site, therefore the required recharge volume is zero. Strictly from the standpoint of adhering to regulatory standards a recharge system is not required and therefore is not proposed.***

*Based on the proposed construction the field will allow for additional recharge into the ground. The existing fields are graded at 1.5 - 2.0% slope. This slope is consistent with athletic fields that have existing silty soils to promote surface drainage. The proposed grade of the turf field is 0.5%. The reduced grade of the turf field increases the time of concentration, slows the water down and allows for additional recharge into the more permeable fill material used to establish grades of the turf fields.*

- C2. Modify the Stormwater Report to reflect the current project.
- a. In the Stormwater Report Narrative, Standard 9: Operation and Maintenance specifies that: "operation and maintenance plan is not needed since there will not be any new stormwater management system put in place in the project work area. Existing onsite stormwater BMPs related to landfill will continue to be operated and maintained by the Town of Newbury in accordance with existing O&M plans." Reference is also made to a proposed solar array

***R2. Replace Section 9 with the following:***

***Standard 9: Operation and Maintenance Plan***

***Area drains, manholes, and trench drains: Periodic inspection and cleaning to make sure they are not plugged. Remove any material and dispose of accordingly.***

*Stone trench level spreaders: Periodic inspection of level spreaders; removal of vegetation from spreaders if needed and inspection of areas downstream of spreaders to ensure that no erosion is occurring; provide loam and seed and/or mulch if erosion is observed.*

- C3. Provide 1:1 mitigation for structures in the 100-foot Buffer Zone.
- Proposing mitigation adjacent to the field may not provide high value mitigation. Consider invasives removal/ replanting in the adjacent wetland. If the wildflower seeding is okay with the Commission, provide details on the site preparation for seeding, and maintenance within an annual, late season mow. Consider a 10 Foot wide strip adjacent to the field to provide a buffer between the mitigation area and the field, and to allow for any necessary field/ fence maintenance activities to be done outside the mitigation area.

**R4** *Mitigation: Middlesex School to remove invasive species up to 25' within and adjacent to the wetlands along the perimeter of the limit of work adjacent to the wetlands.*

*Seeding: The seed mixes proposed will provide habitat value for native pollinators, birds, bees, insects. See attached specification: SECTION 32 92 00 SURFACE RESTORATION OF CROSS COUNTRY AREAS for site preparation for seeding.*

*Maintenance: Middlesex School to maintain seeded areas as described above by mowing annually after the first frost.*

*Buffer Area: A buffer area of 10' has been provided on the plans to allow for maintenance. This area will be mowed up to 1 time per week.*

- C4. Field maintenance.
- Include in the field's operation and maintenance plan to dispose of grass clippings outside the 100-foot buffer zone.

**R4:** *Middlesex School Outdoor IPM plan to be revised as follows:  
Page 5 of 7 Turf Management Plan, Cultural Practices, Mowing: add sentence highlighted in yellow as shown below:*

*Mowing is performed as needed. Our goal is to remove no more than 1/3 of the blade per mowing. Mowing frequency varies with the changing requirements throughout the growing season. Mower blades are thoroughly reconditioned annually, and equipment is washed and maintained throughout the growing season. Clippings are generally not removed and are left to be recycled into the turf. **Dispose of grass clippings outside the 100-foot buffer zone should they be removed.***

- C5. More robust alternative analysis.
- Provide how frequently the fields will be utilized and the difference of ecological impact of grassed fields versus the proposed turf fields. An evaluation of soil health, stabilization, and wildlife functions should be reviewed.
  - Consider the following items as alternatives:

1. Reducing the number of fields to one and rotate the field's orientation 90 degrees to potentially allow for a tournament sized field
2. Retaining the raised fields in a grassed condition.

*R5.a., b.1. Middlesex has 7 athletic fields that can host interscholastic competition. Middlesex supports a team sport requirement which means they have roughly 886 rostered athletes throughout the year. Using last fall as an example, the school would roll out 57 students per competition field. Using the 2 smaller fields (Acorn Field and Spencer Brook Field) for practice they were able to bring the average student per field down to 45. In other words, the school had the equivalent of 4 soccer teams per field during the athletic window in their daily schedule. Middlesex School is not looking to reduce the number of fields on campus to further restrict their program.*

*Active, conventionally managed turf grass is not a significant ecological habitat. With conventionally managed turf grass, the field is managed with pesticides, herbicides, and fertilizers and regularly mowed to maintain the turf. Conventionally managed turf grass is not suitable habitat for flora (native plants) or fauna (native wildlife). While local wildlife such as robins may occasionally use the field to forage for invertebrates such as worms, turf grass is composed of non-native plants that are of little use to native wildlife. The use of both pesticides and herbicides and well as consistent mowing reduces the overall abundance of potential food sources such as invertebrates (worms, insects, etc.). Additionally, fertilizers are known to runoff fields and lawn areas during rain events and leach into groundwater and surface water. The phosphorous within fertilizers significantly affects the water quality of the wetlands surrounding conventionally managed turf grass fields causing algae blooms and in severe cases, depletes the dissolved oxygen within surface water and creates imbalances in water ecosystems which can destroy wildlife and produce other harmful toxins. Pesticides and herbicides may also runoff into groundwater and surface water, affecting aquatic ecosystems. Thus, the very act of planting and maintaining a turf grass field minimizes its ecological benefit in numerous ways.*

*A synthetic turf field is also not a significant ecological habitat because it is an inert product that does not support wildlife. A potential pathway of wildlife exposure is through leaching of chemicals from the synthetic turf into the groundwater which may then migrate into nearby surface water areas. Based on concern over the potential for leaching from synthetic turf into groundwater, Haley & Aldrich was contracted to perform quarterly monitoring of groundwater over a period of 5 years at the Fenn School in Concord, Massachusetts. It is notable that since the Fenn School is in Concord, the climate conditions are the same as at the current project. The synthetic turf at the Fenn School had crumb rubber infill. Analysis for SVOCs and metals including cadmium, copper, lead, zinc was performed. SVOCs were*

*generally not detected above detection limits. The metals analyzed were detected at concentrations that were similar to the initial background concentrations collected prior to installation of the synthetic turf or not above detection limits. At no point in the 5 years of quarterly groundwater tests did the concentrations of metals approach or exceed MassDEP Method 1 GW-3 groundwater standards that are protective of aquatic life in nearby surface water bodies. Thus, even with crumb rubber, which is known to contain trace metals, zinc and PAHs bound within the matrix of the rubber, leaching into groundwater was not significant.*

*Similar to what was observed at the Fenn School, EcoFill the proposed infill for this project, should also not leach hazardous chemicals in significant concentrations. EcoFill is a synthetic plastic/rubber hybrid that contains no heavy metals, very low PAHs and is free of bisphenol-A (BPA), PVC, lead, phthalates, and dioxins. The PAH content is below the acceptable concentrations of the EU REACH standards. In addition, EcoFill meets the following standards:*

- *ASTM F 3188-16 for Safety of Toys - restricts concentrations of metals (US)*
- *EN 71-3 Category III for Safety of Toys - restricts concentrations of metals (European Union)*
- *CA Prop 65 - restricts carcinogens and other toxic compounds (California)*
- *REACH standards of safety - restricts carcinogens and other toxic compounds (European Union)*

*A review of the literature on the toxicity of synthetic turf and specifically crumb rubber infill, presented on EPA's website:*

[https://www.epa.gov/sites/production/files/2019-07/spreadsheet\\_with\\_toxicity\\_reference\\_information\\_0.xlsx](https://www.epa.gov/sites/production/files/2019-07/spreadsheet_with_toxicity_reference_information_0.xlsx)

*notes that the primary leachate concern is zinc and its potential to affect aquatic life. However, zinc is not present in EcoFill.*

*On this basis, it is not recommended that testing of surrounding groundwater be performed.*

*Another potential pathway of wildlife exposure is through migration of the infill into nearby wetland areas. This was also studied at the Fenn School. A 3-year infill migration study was designed to track and test whether and how much of the infill was migrating towards the wetlands. No significant migration of infill was observed.*

*The proposed synthetic turf field will be designed and constructed to have minimal impact on nearby aquatic environments. The polyurethane backing on the field will prevent infill from migrating off the field. Several features of the field design include:*

- *EcoFill has a higher specific gravity and lower static charge compared to crumb rubber fill that will limit migration of the infill above the turf fibers.*
- *The field is contained by a concrete curb that will help contain the infill from migrating off the field.*

*For these reasons, we believe that migration of infill into nearby wetlands will not be significant.*

*b.2. Middlesex School has considered the grass option; however, it is not in alignment with their current program as many of their practices and games have been missed due to inclement weather. Based on timing of spring sports in the north east and late season into the fall, grass fields typically are not playable until the end of April and their susceptibility to severe damage grows significantly in late fall. Playing on the field in early spring and late fall can happen but it only exacerbates poor field conditions and then triggers the cycle of a high level of additional maintenance to try to recover the field. More cultural maintenance practices, fertilizers, overseeding, etc. and possible complete field reconstruction is required when soil structure is lost. The school is interested on having a reliable surface that is in alignment with their sports program.*

C6. Should the NRC approve the synthetic turf fields, they will likely require a protocol to monitor for cadmium, copper, lead, zinc, and SVOCs.

R6. See R5

Sincerely,

WESTON & SAMPSON ENGINEERS, INC.



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