

**The Proposed Artificial Turf Field  
at Lower Faber Field on  
Doremus Avenue, Glen Rock**

**An Evaluation of the Environmental, Health and Safety Risks  
and Recommendations**

Prepared by The Glen Rock Environmental Commission

Submitted: February 13, 2011  
Addendum: July 1, 2013

GLEN ROCK ENVIRONMENTAL COMMISSION

Municipal Building, Harding Plaza, Glen Rock, NJ 07452

## **I. Introduction**

The Glen Rock Environmental Commission has prepared this position paper to provide the Glen Rock Borough Council with additional insights on the potential environmental, health and safety impacts and risks associated with the proposed artificial turf field at Lower Faber Field on Doremus Avenue.

We are providing this information so that the Borough Council can make informed decisions regarding the development of this proposed recreational amenity. We are also providing recommendations which can be implemented to address the associated risks.

This paper is based on extensive research, including:

- Indepth conversation Dr. Christopher C. Obropta, Ph.D., P.E, the Extension Specialist in Water Resources with Rutgers Cooperative Extension, and Associate Professor with the Department of Environmental Sciences at Cook College, Rutgers University. He has a doctorate in Civil Engineering from Stevens Institute of Technology, a M.S. in Civil Engineering from New Jersey Institute of Technology, and a B.S. in Civil Engineering from New Jersey Institute of Technology. Prior to joining Rutgers, Dr. Obropta was an environmental consultant for 12 years at Omni Environmental Corporation. Dr. Obropta has a background in watershed management, water quality modeling, hydrologic and hydraulic modeling, and coastal engineering. His specific experience includes watershed restoration, onsite wastewater treatment system design and management, wasteload allocations and TMDL studies, stormwater management, wetland design, effluent dilution analyses, longshore sediment transport, computer-aided design, and Geographic Information Systems (GIS).

- A review of turf field studies conducted by the Centers for Disease Control, NJ Department of Environmental Protection, various universities, turf field industry associations, and other sources (See Addendum for a complete list of sources consulted.)
- Conversations with Glen Rock Borough Engineer
- Site visits to Lower Faber Field and the Ridgewood Turf field on Spring Street.
- 2002 Glen Rock Master Plan
- 2008 Master Plan Reexamination Report
- Glen Rock Municipal Stormwater Management Plan
- 2009 Glen Rock Environmental Resources Inventory
- Indepth conversation with Bayard DeMallie, coauthor of the REAC Turf Field Study
- The Tenafly Environmental Commission Turf Field Position paper

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## **II. Risks and Concerns**

### ***Master Plan – Is this proposed recreational amenity consistent with the Glen Rock Master Plan?***

The Open Space and Recreation Plan Element (Section IV-3) of the 2002 Master Plan includes Goal #5:

“To preserve lands located adjacent to the HoHokus Brook and Diamond Brook in order to protect the environmental characteristics of the water bodies and its surrounding land areas.”

The Open Space and Recreation Plan Element further states that,

“The low lying wetland areas adjacent to (Diamond) brook, particularly on the eastern side create environmentally sensitive areas, which should be preserved in their natural state.”

#### *Conclusion:*

Converting natural land to artificial turf does not preserve the land or protect the environmental characteristics of the Diamond Brook and is thus not consistent with this goal.

### ***Stormwater management - Is this proposed development covered by the Glen Rock Stormwater Management Plan?***

The Glen Rock Stormwater Management Plan was adopted in 2006 in recognition of the need for a comprehensive, coordinated response to stormwater management. The resulting

Stormwater Management Ordinance sets forth standards covering new development such as the Lower Faber Artificial Turf Field.

*Recommendations:* Under this ordinance, the developer must submit a Stormwater Management Plan as part of its site plan for review by the Glen Rock Planning Board and Environmental Commission.

Furthermore, “During construction, the Borough will ensure observe the construction of the project to ensure that the stormwater management measures are constructed and function as designed. After construction, the Borough will ensure the long-term operation and maintenance of stormwater BMPS (best management practices).”

***Flooding – Will the installation of turf field exacerbate flooding along Diamond Brook?***

Stormwater runoff currently presents severe physical, economic and environmental challenges in Glen Rock. All of the stormwater runoff in Glen Rock drains to only two small streams: Diamond Brook in the western half of town and Hohokus Brook on the eastern edge of the borough. Diamond Brook also absorbs significant stormwater runoff from the properties in Ridgewood west of Lincoln Avenue. This drainage pattern causes repeated, severe flooding that damages homes and impedes traffic flow when streets become impassable.

This flooding is the result of the high amount of impervious surface (33 %) which prevents stormwater from the natural process of being absorbed by the soil where it falls, slowly filtering through the soil (being cleansed in the process) and returning to underground aquifers where it recharges our supply of drinking water. (Glen Rock obtains its drinking water from wells which draw from underground aquifers.) As the amount of impervious surface gradually increases each year, the flooding worsens.

The proposed location of the artificial turf field is problematic. The proposed field is located in wetlands adjacent to the Diamond Brook and partially in a flood zone. This land plays a crucial role in the drainage and stormwater management infrastructure in the borough.

The current flooding of the Lower Faber Field which makes it unusable for athletics is the very benefit that it provides to the many homeowners whose residences are threatened by flooding along Diamond Brook.

Currently, Lower Faber Field is a valuable component of the stormwater management infrastructure in town. As it slows the runoff of rainwater and allows it to absorb into the soil, it mitigates the flooding along Diamond Brook.

The Glen Rock Environmental Commission acknowledges the strong desire among certain residents for increased access to playing fields and the limited availability of fields. Parents and children are inconvenienced and disappointed when games are cancelled due to poor field conditions.

It is essential that this recreational amenity does not further stress and jeopardize the already overburdened and inadequate stormwater management infrastructure in town. The Borough Council's first responsibility is to protect the economic investment of property owners, the health and proper functioning of vital infrastructure, and an adequate water supply for its residents,

Risks to the Borough:

If the Borough Council fails in any of these regards, it faces the risk of reduced tax revenues from diminished property value, cost of litigation from homeowners who experience loss and damage, and increases water costs as Ridgewood Water is forced to increase its reliance on imported surface water as the underground aquifers are permanently depleted.

Once all these essential services have been protected and assured, then the Borough Council can consider allowing for recreational amenities.

This is the most important stipulation that the Glen Rock Environmental Commission makes of the proposed artificial turf field: There must be no increase in stormwater runoff from that field. The field designers must be familiar with and adhere to Glen Rock's Municipal Stormwater Management Plan. The Turf Committee must obtain necessary DEP permits and adhere to all DEP restrictions on that land.

*Recommendation:* We require that the Turf Committee allocate 10% of the engineering design fee to fund an independent review of the design to assure compliance with stormwater management plan and other environmental considerations.

***Soil Erosion – How much soil will be disturbed by the construction of this structure?***

The Borough's Stormwater Management Ordinance requires that all new development and redevelopment plans comply with New Jersey's Soil Erosion and Sediment Control Standards. Since this property will result in a soil disturbance exceeding 5,000 sq. ft., it is subject to review by the Bergen County Soil Conservation District. The site plan approval cannot be granted until the Bergen County Soil Conservation District has granted approval and certification has been obtained.

*Recommendation:* As required by the ordinance, Borough inspectors will observe on-site soil erosion and sediment control measures during construction and report any inconsistencies to the Bergen County Soil Conservation District.



***Solid Waste – When the playing surface reaches the end of its usable life in an estimated 10-15 years, will the disposal of the turf skin contribute to solid waste or can the material be reclaimed and recycled?***

The Turf Committee should take a total life-cycle approach to this project and plan in advance for disposal of the turf when the field reaches the end of its life expectancy. Although the REAC study and Glen Rock Turf committee estimate the life span at 10-15 years, experts advise replacing the field closer to 8 years to minimize exposure to lead dust from the turf fibers as they disintegrate.

*Recommendation:* The Turf Committee needs to establish a funding mechanism to create reserves so that funds so that the disposal and replacement costs are readily available and do not become a financial responsibility of the Borough. The design plan should include details on recycling and disposal methods.

***Health Hazards – Does playing on an artificial turf field pose health threats to athletes who use the field?***

We briefly summarize below a few of the potential health risks that an artificial turf presents. We recommend that the Glen Rock Board of Public Health work with the Glen Rock Recreation Board to further study potential health risks and propose ways to reduce these risks.

1) Playing on artificial turf fields has been linked to increased incidence of **staph (MRSA) infections**. According to a study conducted by Dr. Brad Fresenburg, of the University of Missouri, artificial turf surface harbors pathogenic bacteria more readily, and due to its increased tendency for abrading skin, results in more frequent reports of infection. No disinfection practices are normally performed on natural turf fields. Naturally occurring bacteria in soils actually break down human body fluids or other organic matter.

*Recommendation:* The Glen Rock Advisory Board and Board of Health should research typical best practices for sanitizing fields and institute a policy for sanitizing the field.

2) Children who play on artificial turf fields are at risk of **exposure to lead** in the turf fibers and crumb rubber through inhalation (see the attached warning from the [Centers for Disease Control](#)).

*Recommendations:* We recommend that the Glen Rock Board of Public Health work with the Glen Rock Recreation Advisory Board to study potential health risks and propose ways to reduce these risks.

- We also recommend that the Turf Field Committee select a vendor who can verify that they use lead-free crumb rubber. They should ask the vendor to conduct appropriate testing to determine the levels of potential contaminants, including lead, in the turf and associated materials.
- We recommend that the Glen Rock Recreation Advisory Board annually provide a copy of the [CDC Health Alert Network Advisory on Potential Exposure to Lead in Artificial Turf](#) to parents of all children who will be playing on the turf field and that the Borough of Glen Rock obtain a waiver of liability from these parents.
- The Glen Rock Recreational Advisory Board should provide parents with the results of the [New Jersey Artificial Turf Investigation](#) so they can make an informed decision about their children's exposure to this potential health hazard.
- Parents should also be provided with instructions with a list of precautions to reduce their children's exposure to lead. (See addendum.)
- Since potential lead exposure increases as the turf fiber deteriorates over time, we recommend that the Glen Rock Advisory Board and Glen Rock Board of Health engage an environmental consultant to conduct annual assessments to determine the potential lead exposure to athletes.

- If the field is found to have high lead levels, field managers can consider limiting access to the field, especially for the most vulnerable population of children under 7 years of age.
- As a precaution, until further guidance is available, custodians of all turf fields, but especially turf fields with nylon fibers, can use dust suppression, in the form of watering down the field, can be conducted before and after the field is being utilized.

3) The **high surface temperatures** of the artificial turf playing surface has become an issue at many sports facilities. According to studies completed at University of Missouri and Brigham Young University (BYU), (“Synthetic Surface Heat Studies” - by Drs. C. Frank Williams & Gilbert F. Pulley), artificial turf surfaces were found to be consistently hotter than natural turf playing surfaces. Studies documented differential temperatures up to eighty degrees (80°) degrees hotter on artificial surfaces in the sun as compared to natural turf. Artificial turf was found to be twenty-four degrees (24°) hotter than natural turf, in the shade. The use of irrigation systems is effective in temporarily cooling the surface. However, in the BYU study, the surface temperature rebounded from the low of 85° after irrigation, to 120° within five minutes, and 164° within twenty minutes. The highest recorded artificial turf surface temperature during the study was 200° on a day where the maximum air temperature was 98°. In the same study, natural turf surfaces were found to be cooler, with a range of 78° to 88° under the same conditions.

There seems to be no effective method for cooling the fields. If, however the Glen Rock Recreational Advisory Board and Department of Public Works intend to cool down the field through irrigation, this will present an additional strain on the local water supply during a time when water irrigation restrictions are in often place.

*Recommendation:* We recommend that the Glen Rock Recreational Advisory Board and Glen Rock Board of Health may wish to follow the example of other municipalities which are developing procedures to take when ambient temperature and humidity is high, to minimize the risks of burns, dehydration and heat exhaustion in athletes.

***Heat – Are artificial turf fields hotter than natural fields and, if so, what can be done about it?***

Turf fields get very hot, so hot that they need to be hosed down to cool them off so children can play on them. (See above.)

*Recommendation:* Given the growing pressure on water supplies, we request firm projections of water consumption. We recommend that the Turf Field construction include installation of a water collection and storage system to collect and hold stormwater runoff. The stored rainwater could also be used to irrigate the turf field for cooling and/cleaning purposes.

***Excess water – What will be done with the water that runs off the artificial turf field?***

Experts predict that water shortages will be among the next global resource crisis. In fact, water shortages have already reached New Jersey. In southern New Jersey, several communities can no longer obtain drinking water from wells due to salt water intrusion into depleted underground aquifers. Locally, Ridgewood Water has been forced to contract with United Water for supplemental water supply due to depletion of the underground aquifer which provides water to its wells.

*Recommendation:* By installing a [rainwater harvesting and convenience system](#), it would be possible to capture the unwanted water from Lower Faber Field and divert it for use in filling the Glen Rock Pool, which is adjacent to Lower Faber Field. This innovative rainwater collection and reuse system can provide an economical, long-term mechanism for diverting stormwater from the already over-taxed Diamond Brook and storing it for reuse at another popular recreational facility: the Glen Rock Pool. This would benefit the community through reduced flooding along Diamond Brook, reduce use of potable water, and permanently shield Glen Rock taxpayers from inevitable costs increases in for water provided by Ridgewood Water. These

systems reduce the demand for potable water and pay for themselves in a few years.

<http://www.greenmagonline.com/?p=1297>

***Habitat – What be done to compensate for the loss of habitat?***

Converting grass to an essentially impervious surface reduces available habitat (though of an admittedly low quality) in a wetlands area. Wetlands are key in supporting a wide range of wildlife.

*Recommendation:* The Turf Committee should allocate 30% of the \$100,000 it has budgeted for amenities (i.e., gates, scoreboard and fencing) for landscaping to provide for native trees, evergreens, shrubs, grasses and perennials, to be planted surrounding the field. This plan should be submitted to the Shade Tree Advisory Committee and GREC for review and approval. As required by the Stormwater Management ordinance, the Turf Committee must “provide low-maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers and pesticides.”

***Traffic Congestion – What can be done to reduce the traffic congestion which will result from increased use of the field?***

Increased utilization of Lower Faber Field could result in traffic congestion, increased vehicle emissions, further impairment of local air quality and overcrowding of the limited parking available.

*Recommendations:* We recommend that bicycle racks be installed at Lower Faber Field and the creation of bike paths to encourage pedestrian and bicycle use. This will provide a safe alternative to children riding their bikes in the street or on the sidewalk. These trails can connect with other adjacent recreational facilities such as the Glen Rock Pool and the Thielke Arboretum.

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***Light pollution - What negative impact will night-time lighting have on the surrounding homeowners?***

Spillover light from the permanent lights on Upper Faber Field and portable lights on Lower Faber is already generating complaints from residents who are affected by the light. Installing higher, more powerful, permanent lights on Lower Faber may exacerbate their complaints. Residents have also expressed concerns that the lighting will negatively affect their property values.

*Recommendation:* Submit the proposed lighting plan to the Glen Rock Planning Board and Environmental Commission for review to assure that the latest technologies in directional outdoor lighting are being used.

***Maintenance Costs – What are the costs of ongoing maintenance?***

Artificial turf fields are not maintenance-free. According to the publication *Artificial Turf News*, annual maintenance costs were estimated to run as high as \$22,760 per year in 2004-2005, according to one synthetic turf expert.

*Recommendation:* The Turf Field Committee should develop an annual projected maintenance budget which details all maintenance costs including equipment, labor and supplies, and plan to generate enough funds to cover those expenses.

Submitted by:

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#### **V . Practices for minimizing lead exposure**

- Encourage individuals who use the field to perform aggressive hand/body washing after playing on the field.
- Clothes that were worn on the field should be taken off inside out and washed separately.
- Children should shower and wash thoroughly after playing on artificial turf fields.



#### **IV. Research Sources**

[“Natural Grass and Artificial Turf: Separating Myths and Fact,”](#) Turfgrass Resource Center, [www.TurfResourceCenter](http://www.TurfResourceCenter)

Tenafly Environmental Commission, Turf Field Position Paper

“Preliminary Assessment of the Toxicity from Exposure to Crumb Rubber: Its use in Playgrounds and Artificial Turf Playing Fields,” June 2007, NJ Department of Environmental Protection

City of Costa Mesa, City Council Study Session Report, “Use of Synthetic Turf for Sports Field Applications,” September 5, 2007

[“Synthetic Turf Irrigation: Part 1,”](#) Jul 28, 2005, *Athletic Turf News*

“Supplier faults bacteria-on-synthetics study,” Sept. 15, 2006, *Athletic Turf News*

“Experts spell out the true cost of synthetic turf maintenance,” May 25, 2005, *Athletic Turf News*

“Pro Football Players Pass Staph Infections: Staph Outbreak That Hit NFL Team Linked to Poor Hygiene On and Off the Field.” WebMD Health News, Feb. 2, 2005

“Synthetic Turf Playing Fields Present Unique Dangers,” Posted 3 November 2005, Applied Turfgrass Science, University of Missouri

“Assessment of Environmental, Health and Human Safety Concerns Related to the Synthetic Turf Surface at Maple Park in Ridgewood, NJ,” Ridgewood Environmental Advisory Committee, January - October 2009.

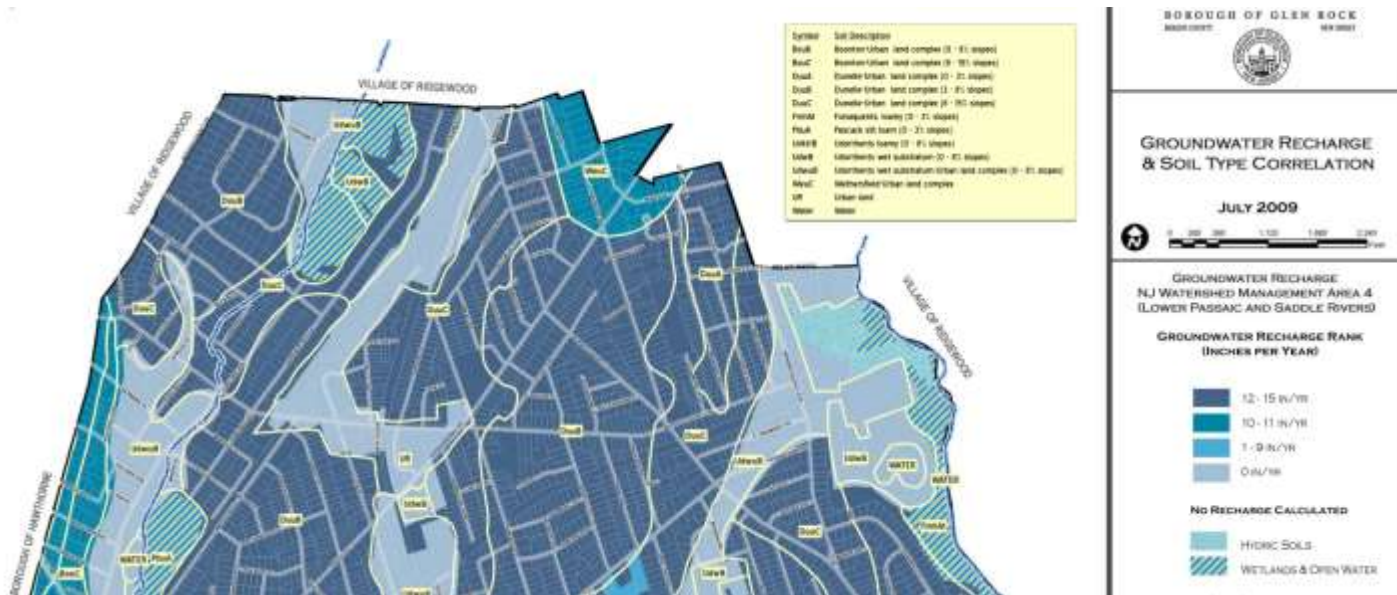
“Green Buildings + Water Performance,” *Building Design + Construction*,  
<http://www.skyharvester.com/downloads.php>

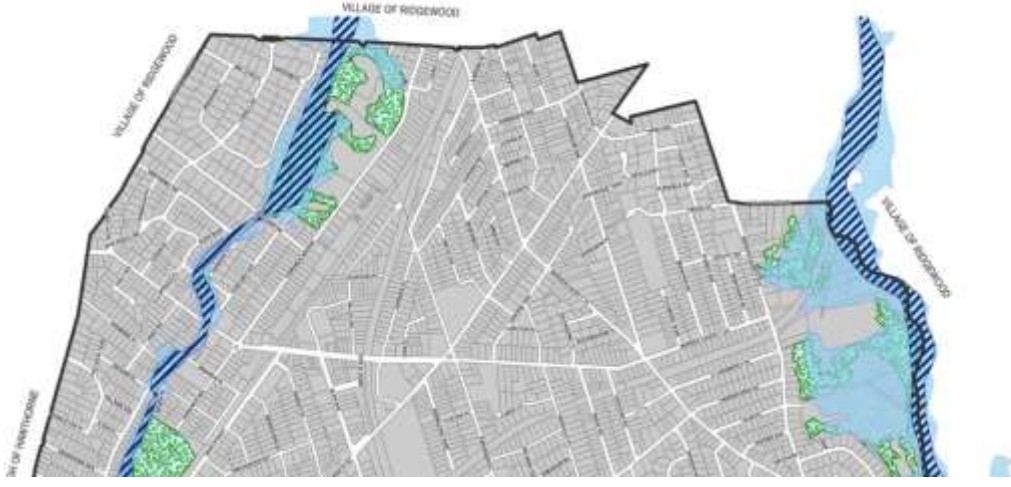
#### IV. ADDENDUM July 2, 2013

Any plans to construct an artificial turf field or any other construction on the Lower Faber Athletic Field must take into consideration the Groundwater Recharge and Soil Type, and the Environmental Constraints of this location, as noted in the [2009 Glen Rock Environmental Resources Inventory](#).

#### **Recommendation:**

We recommend that the Glen Rock Borough Council engage an independent, professional engineering firm that specializes in hydrology and wetlands be engaged to conduct an independent assessment of this land for the proposed use.





BOROUGH OF GLEN ROCK  
2000 COURT  
NEW YORK

ENVIRONMENTAL  
CONSTRAINTS

JULY 2009

0 330 660 1,320 1,980 2,640 Feet

FLOODWAY AND WETLANDS  
ANALYSIS

FEMA DELINEATIONS

- FLOODWAY
- FLOOD HAZARD AREA  
ZONE AED

NJDEP DATA

- WETLANDS