

December 5, 2006

Mr. Richard Tomeczyk
Massachusetts Department of Environmental Protection
Northeast Regional Office
205B Lowell Street
Wilmington, MA 01887

RE: **DEP FILE 322-661: Wayland Conservation Commission Order of Conditions.**

Dear Mr. Tomeczyk:

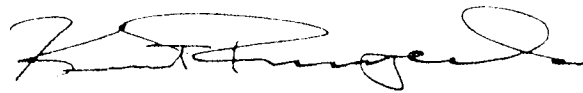
Please accept this filing of a notice of appeal under the Massachusetts Wetlands Protection Act by ten residents of the Town of Wayland of the Conservation Commission's approval of the Wayland High School Turf Replacement Project subject to an Order of Conditions dated November 21, 2006, DEP File Number 322-661. Thomas Sciacca of 31 Rolling Lane, Wayland MA 01778 is the authorized representative for the ten residents whose names and addresses appear below.

Sincerely,

Thomas Sciacca
31 Rolling Lane
Wayland, MA 01778
508-358-2980




Kurt Trampusch
Weir Meadow Rd
Wayland, MA 01778
508-358-4205



Jane Sciacca
31 Rolling Lane
Wayland, MA 01778
508-358-2980



WILLIAM J. MURPHY, JR.
85 OXBOW ROAD WAYLAND, MA 01778
Wayland, MA 01778 

PAUL D. ABRAMSON Paul D Abramson
4 HAMPSHIRE RD

Wayland, MA 01778

CELENE ABRAMSON Celene Abramson
4 HAMPSHIRE RD

Wayland, MA 01778

BETTY SALZBERG Betty Salzberg
28 GROVE ST

Wayland, MA 01778

LAWRENCE MORRIS L E Morris
28 GROVE STREET

Wayland, MA 01778

PERRY R. HAGENSTEIN Perry R. Hagenstein
15 BENNETT RD.

Wayland, MA 01778

LINDA L. SEGAL Linda L. Segal
9 AQUEDUCT RD.

Wayland, MA 01778

JUDY A. BENNETT Judy A. Bennett
66 HAWTHORNE ROAD

Wayland, MA 01778

Cc: Craig Forman, Wayland Boosters Association
Wayland Conservation Commission

Order of Conditions 322-661
Wayland High School Turf Replacement
264 Old Connecticut Path, Wayland
Map 37 Parcel 260 November 21, 2006

This is an appeal under M.G.L. c. 131 s. 40 by a group of ten residents of Wayland of the approval of the Wayland High School Turf Replacement Project [hereafter the Project], subject to the Findings and Orders of Conditions, issued by the Wayland Conservation Commission on November 21, 2006. The Project is an in-place replacement of an existing Wayland High School natural turf athletic field with a two-acre, tire-infill synthetic turf field. The existing field is currently maintained with a minimum of chemical and fertilizer applications due to its proximity to the Town's public drinking water supply.

Our paramount concern is the protection of the Town of Wayland's public water supply, specifically Happy Hollow Wells # 1 & # 2. It is our contention that without additional mitigation the Project poses a serious and irreparable threat to the water quality of this public water supply. We seek a superceding Order of Conditions by DEP that will ensure that all necessary steps are taken to gather and to consider critical factual evidence that will inform decisions and actions so as to mitigate adverse impacts of the proposed project on 40% of the Town's finished potable water. The Wayland Conservation Commission, in approving this project, failed to consider issues of Project leachate water quality, temperature, and quantity and that recent research supports a presumption of leachate production from the crumb-rubber tire infill with a significant quantity of volatile and semi-volatile organic compounds and heavy metals potentially toxic to the receiving aquatic environments.

The Project borders vegetated wetland and is located in a Zone II aquifer protection area. This is an area designated by the Source Water Assessment Program (SWAP) with a "high" potential to become contaminated due to land uses and activities within its recharge area. Since the Project is designed to promote the efficient collection of most of the rainfall and irrigation water applied to the surface, an amount in excess of two million

gallons a year from predicted rainfall amounts will flow through the sand-and-tire “infill” and after collection will be conveyed directly to the Zone I protection areas of the Happy Hollow wells. From the outfall into Dudley Brook, a source water identified by the Massachusetts Natural Heritage & Endangered Species Program as a “Supporting Natural Landscape” to the closely proximate “Core Habitat” of the downstream Great Meadows National Wildlife Refuge and the Sudbury River with its rare “Wild and Scenic River” designation.

We are seeking appropriate modifications to the Project which will insure that the quality of the water leaving the Project (either surface or subsurface flow) does not degrade the source waters of the Happy Hollow wells. The options proposed are 1) the Project be constructed with a low-toxicity, virgin rubber infill to replace the considerably more toxic 40,000 truck-tire SBR crumb rubber infill¹; 2) the addition of effective leachate treatment technology at the point the leachate leaves the Project site; 3) relocation of the 12” conveyance collection leachate pipe to an alternative, less potentially harmful location. Because Wayland Conservation Commission failed to adequately address water quality concerns, and failed to make factual findings relating to water quality, these potential alternatives which might have been considered were not addressed.

The “Findings of Fact” at Issue Are Misleading, Incorrect, and Lack a Factual Basis for Water Quality Evaluation

1. The Findings (h.) note that testing of material samples was done to simulate leachate from the field. It fails to mention that citizen testimony was received that the testing was inconclusive because it was not conducted at the elevated temperatures which are a well-known and widely noted characteristic of these fields. Temperature elevation of as much as 40 degrees C is well documented and may increase leaching rates at least an order of magnitude. ²

2. The Commission has failed to adequately address the quality of leachate from the Project. By utilizing an existing 12” conveyance currently in use to collect leachate from

the existing grass football field, the artificial turf project will be collecting most leachate from the proposed project and significantly substituting the leachate from 40,000 truck tires for the partial leachate from an organic grass field which is under strict restrictions as to the application of chemical fertilizers, pesticides, fungicides, etc. No finding was made that acknowledged the body of scientific research provided to the Commission characterizing or qualitatively evaluating toxic leachates from crumb rubber and tire components used to build artificial turf fields.³

3. The testing relied on by the Commission focused only on toxic substances relevant to drinking water standards. Toxicity studies involving tire leachate compounds that are toxic to aquatic organisms⁴ and were not addressed in the leachate testing. A comprehensive list of all chemical components and metals of a typical tire can be found at this endnote.⁵

4. The Findings (j.) reference testimony from a Water Commissioner that the drainage outfall from the field was not within Zone 1 of the nearby well. The finding failed to address the accuracy of this statement despite subsequent testimony by residents and documentation in the form of plot plans and aerial photos showing that the outfall is clearly within the Zone 1 boundaries. (See attachments.)⁶

5. The Findings (k.) reference testimony that the runoff would not impact the wells. It neglected to mention citizen input that the drainage from the outfall runs toward the wells and then infiltrates the ground as it draws abreast of the wells.

6. Thermal Effects on Aquatic Life at Project Outfall – No consideration has been given to the elevated temperatures of leachate during the summer months as it is collected in a heated field and conveyed through a point-source to the banks and stream of Dudley Brook.

7. The Orders failed to adequately address impact of increased acidity on the leaching rate of heavy metals from the crumb infill of the Project. Data from the Lexington test

site shows pH levels as low as 3.6 occurring during the last ten years. Testing performed for project consultant was done at a pH of 4.2 and does not represent worse-case conditions.⁷

8. Commission finding (g) mentions current use of the parking lot. No mention was made of the concerns raised about the effects on the wells from increased traffic even though use of the adjacent parking lot is inherent in the project. The goal of the project is to increase usage of the site by at least a factor of ten and add revenue to the town from non-school athletic organizations. The parking lot is largely in zone 1 and drains entirely into zone 1. There are no mitigating stormwater structures, such as oil separators, preventing vehicle fluids from infiltrating the zone 1 soil. Such structures should be required as a part of this project.

9. There are no restrictions on winter use to mitigate salt from increased traffic. The wells already exceed the MCL limits for sodium. The salt is clearly from vehicles using the parking lot, since salt actually applied to the lot is already limited and another well in the same Zone 2 but away from this parking lot is much lower in sodium. Winter use of Project should be legally limited as part of a superceding order.

10. Finding (bb): We agree that the approval of this project should be conditioned upon a Beneficial Use Determination (BUD). We contend that the Conservation Commission's failure to make necessary findings of fact regarding water quality will impede DEP's full consideration of the conditions for the issuance of a BUD. Metal and chemical components of crumb rubber include numerous compounds found on the "Critical Contaminants of Concern List": Draft Interim Guidance Document for Beneficial Use Determination Regulations 310 CMR 19.060, March 18, 2004 **Level 1 Substances:** benzo(a)pyrene, hexachlorobenzene, octachlorostyrene, toxaphene; **Level 2 Substances:** cadmium, hexachlorobutadiene, numerous PAH's such as benzo(a)anthracene; **Select Compounds** from "Draft RCRA Waste Minimization PBT Chemical List": Phenol, Phthalate ester, Polycyclic aromatic hydrocarbons benzo(a)pyrene, fluoranthene,

flourene, naphthalene, pyrene; and Heavy Metals: Arsenic, lead, chromium, copper, nickel, selenium, zinc, cyanide.⁸

11. The Notice of Intent claims that the only alternative is no build. No alternative sites are listed in the NOI or were discussed by the applicant or Conservation Commission despite citizen input that alternate sites were available and environmentally preferable. The Project is meant to displace and/or reduce usage in all other fields in town. Unlike in other Massachusetts communities, there was no town-wide feasibility or impact assessment done prior to the selection of the High School site. Other possibilities include the Cochituate Ball Field, Town Building field, Nike site, and the Loker Recreation Area. An alternatives study should be required. (310 CMR 10.58(4) and 310 CMR 10.55(4), respectively.)

12. We agree with condition (52.) that “Any backfill used in connection with this project shall be clean fill. Any backfill shall not contain trash, refuse, rubbish or debris, including but not limited to lumber, bricks, plaster, wire lath, paper cardboard, pipe, *tires*, ashes, refrigerators, motor vehicles, asphalt, *or parts of any of the foregoing.*”

Proposed Additional Orders of Condition:

1. Modified or Alternate Technology – since the technology of “artificial turf athletic fields” includes non-toxic rubber infill, no-rubber infill, fiber-assisted grass systems, and in development a modular unified system which has no infill requirement, the project should review and choose the most suitable zero pollution leachate project for this critically important site.⁹

2. Pollution Treatment – if the tire option is used for infill, a complete pollution elimination system should be installed at the outfall of the leachate pipe and monitored regularly by suitable but comprehensive water quality testing which includes a standard protocol which tests for all leachable components of tires including emerging contaminants of concern such as NDMA and octylphenol.

¹ TPV Granules: "Now, with worldwide concerns about player and environmental safety TPV granules have made a timely entry into the marketplace. A virgin material made from a high-quality polymer TPV granules are non toxic, non allergenic, and are free of dust and contaminants. There are no zinc, heavy metals, or phthalates particles in the product to foster leaching issues". Source: Target Technologies International, Inc. http://www.ttionline.com/tpv_granules.htm)

² McNitt, Andrew S. Chart 20B, <http://cropsoil.psu.edu/mcnitt/infill7a.cfm>)

³ Evans JJ. Rubber Tire Leachates in the Aquatic Environment. *Environm Contamin Toxicol.* 1997;151:67–115.

⁴ *Environ Toxicol Chem.* 2003 Dec ;22:2926-**Biomarker responses and chemical analyses in fish indicate leakage of polycyclic aromatic hydrocarbons and other compounds from car tire rubber.** Eirikur Stephensen, Margaretha Adolfsson-Erici, Malin Celander, Mats Hulander, Jari Parkkonen, Tove Hegelund, Joachim Sturve, Linda Hasselberg, Madeleine Bengtsson, Lars Förlin

Gualtieri, M.; Andrioletti, M.; Vismara, C.; Milani, M.; Camatini, M. Toxicity of tire debris leachates. *Environ Intern.* 2005. .

⁵ **Mass Concentrations for Organic Compounds Found in Tire Wear Particles** Mass Concentrations (micro-grams g-1 particle sample)
<http://www.eng.fiu.edu/ccc/ce/Air/Pollution/Research/Publications/Sources3-RoadDust-F&T-1993.pdf> *Environ. Sci. Technol.* **1993**, *27*, 1892-1904

N-Alkanes (23)

Nonadecane

eicosane

heneicosane

docosane

tricosane

tetracosane

pentacosane

hexacosane

heptacosane

octacosane

nonacosane

triacontane

hentriacontane

dotriacontane

tritriacontane

tetratriacontane

pentatriacontane

hexatriacontane

heptatriacontane

octatriacontane

nonatriacontane

tetracontane

hentetracontane

total class mass concentration 18842.3

n-Alkanoic Acids (15)

hexanoic acid

heptanoic acid

octanoic acid

nonanoic acid

decanoic acid

undecanoic acid

dodecanoic acid

tridecanoic acid

tetradecanoic acid (myristic acid)

pentadecanoic acid

hexadecanoic acid (palmitic acid)
heptadecanoic acid
octadecanoic acid (stearic acid)
nonadecanoic acid
eicosanoic acid
total class mass concentration **12197.3**

n-Alkenoic Acids (3)
cis-9-octadecenoic acid (oleic acid)
9,12-Octadecadienoic acid (linoleic acid)
9,12,15-octadecatrienoic acid (linolenic acid)
total class mass concentration **1279.2**

Benzoic Acids (3)
Benzoic acid
4-methylbenzoic acid
3,4-dimethoxybenzoic acid
total class mass concentration **74.8**

Substituted Benzaldehydes (3)
2-methylbenzaldehyde
3-methylbenzaldehyde
4-methylbenzaldehyde
total class mass concentration **7.8**

Thiazole (1)
benzothiazole
total class mass concentration **124.3**

Polycyclic Aromatic Hydrocarbons (PAH) (13)
phenanthrene
methyl(phenanthrenes, anthracenes)
dimethyl(phenanthrenes, anthracenes)
fluoranthene
pyrene
methyl(fluoranthenes, pyrenes)
benzo[a]fluorene/benzo[b]fluorene
benzo[ghi]fluoranthene
chrysenetriphenylene
methyl(benz[a]anthracenes, chrysenes, triphenylenes)
dimethyl(fluoranthenes, pyrenes)
benzo[e]pyrene
benzo[k]pyrene Endocrine disruptor under some regulations
perylene
benzo[ghi]perylene
total class mass concentration **226.1**

Polycyclic Aromatic Ketones (PAK) and Quinones (PAQ) (1)
9H-xanthen-9-one (xanthone)
total class mass concentration **0.45**

Regular Steranes (4)
20s- and 20-R-5a(H),14~(H),17P(H)-cholestanes
20R-5a(H),14~(H),17a(~)-cholestane
20s- and 20-R-5a(H),148(H),17P(H)-ergostanes
20s- and 20-R-5a(M-148(H),17P(H)-sitostanes
total class mass concentration **74.2**

Pentacyclic Triterpanes (7)
22,29,30-trisnorhopane
17@ (H),21@ (H)-30-norhopane

17a(H),21@ (H)-hopane
22S-17a(H),21p(H)-homohopane
22R-17a(H),21@ (H)-homohopane
22S-17a(H),21@ (H)-bishomohopane
22R-17a(H),21p(H)-bishomohopane
total class mass concentration 684.4

Natural Resins (6)

dehydroabietic acid
abietic acid
7-oxodehydroabietic acid
13@-ethyl-13-methylpodocarp-8-en-15-oiacc id
13a-isopropyl-13-methylpodocarp-8-en-15-oiacc id
13@-isopropyl-13-methylpodocarp-8-15-oiacc id
total class mass concentration 9513.3

Amide (1)

4-phenylbenzenamine
total class mass concentration 12.9

Chlorinated Organics (2)

a-chloroindane
2,4,5'-trichlorobiphenyl
total class mass concentration 5.3

Other Compounds (5)

hydroxymethylphthalimide
p-octylphenol
naphthalene
Eucrone
total class mass concentration 72.1

Heavy Metals

Cadmium
Copper
Zinc
Lead
Arsenic
Chromium
Nickle
Cyanide
Thallium
Cobalt

⁶ http://www.waylandschoolcommittee.org/whs/hsbc/WHS_sitemap.pdf
http://www.waylandschoolcommittee.org/whs/hsbc/WHS_Site_Map.html

⁷ The Lexington, Massachusetts, NADP/NTN site (site #MA13 (East)).

⁸ <http://www.eng.fiu.edu/ccc/cc/Air%20Pollution%20Research%20Publications%20Sources3-RoadDust-ES&T-1993.pdf> *Environ. Sci. Technol.* **1993**, *27*, 1892-1904

⁹ TenCate, based in the Netherlands, has signed a letter of intent with [GreenFields](#) to develop a new artificial grass system. This "4th generation of synthetic turf" is based on an integrated synthetic turf system that no longer will be composed of individual components (fiber, backing, infill, sub-base), it reported in a news release Sept. 20.] <http://www.athleticturf.net/athleticturf/article/articleDetail.jsp?id=374145>