

August 26th, 2008

Dr. Donald J. Coe, Chairman
Members of the Town of Bedford Planning Board
425 Cherry Street
Bedford Hills, NY 10507

Re: Seven Springs DEIS
Bedford: Section 94.18, Block 1, Lot 1

Dear Dr. Coe & Members of the Planning Board,

The Croton Watershed Clean Water Coalition, Inc. (CWCWC) thanks you for this opportunity to submit comments on the proposal for development within the Bedford section of Seven Springs. As a not-for-profit coalition of community, environmental, housing and religious organizations throughout NYC, Westchester and Putnam Counties, CWCWC is particularly concerned with water quality issues throughout the Croton Watershed.

PHOSPHORUS LOADING TO BYRAM LAKE AND THE CROTON WATERSHED

The issue of how much phosphorus - the limiting pollutant for algae growth - emanates from the largely forested East of Hudson (EOH) watershed in which the Seven Springs development lies, is basic to preserving water quality in the drinking water reservoirs that will be affected by this development. These include Byram Lake, the headwaters of the Byram River that eventually discharges to Long Island Sound; Byram Lake is the sole source of drinking water for the Town/Village of Mount Kisco.

Also included is the New Croton Reservoir, the terminal reservoir of the Croton Watershed whose reservoirs are included in the East of Hudson (EOH) Watershed. Under normal circumstances, the Croton Watershed supplies 10% of

NYC's drinking water needs. In times of drought, this can be as high as 30% of NYC's needs.

It is our opinion, as discussed in the following,

- (a) the applicant's estimates of pre-development phosphorus loading are inaccurate;
- (b) the applicant uses an inappropriate methodology for estimating post-development phosphorus loading.

(a) Discussion of Pre-Development Phosphorus Loading

From studies conducted during the 1990s in the general area of the EOH Watershed, in order to determine the Total Maximum Daily Loads (TMDLs) for its reservoirs, NYC DEP (NYC Department of Environmental Protection) concluded the best value for the phosphorus export coefficient from forests to be 0.05 kilograms per hectare per year (kg/ha-yr) or 0.0446 pounds per acre per year (lbs/acre-yr).ⁱ However, the applicant uses double that amount - 0.1 kg/ha-yr or 0.89 lbs/acre-yr - in evaluating the phosphorus load from forests on the subject property, regardless on whether they drain into Byram Lake or the East of Hudson (i.e., Croton) watershed.

This is the value used in Reducing the Impacts of Stormwater Runoff from New Development, NYS Department of Environmental Conservation, April 1993, page 40.ⁱⁱ However, that value was derived for forests in Northern Virginia and is less representative of values in the EOH watershed than those used by NYCDEP, derived from local testing.

Obviously, the higher the pre-development phosphorus load, the easier it is for the applicant to not exceed that amount post-development. DEP's phosphorus export coefficient of 0.05 kg/ha/yr is half of the applicant's 0.1 kg/ha/yr, meaning that the applicant could export twice the amount of phosphorus as allowed by DEP under the TMDL program. Incidentally, the TMDLs for the NYC watersheds were approved by both the USEPA (US Environmental Protection Agency) and the NYSDEC (NYS Department of Environmental Conservation) in the year 2000. These agencies were, therefore, in agreement with the 0.05kg/ha-yr for the export coefficient for phosphorus from forested lands.

The NYCDEP has accepted the above-mentioned 0.05 kg/ha-yr.ⁱⁱⁱ On page 14 of the report, DEP states: "DEP has chosen to use 0.05 kg/ha-yr (kilograms per hectare per year) for the East-of-Hudson watershed." In all its subsequent research documents on TMDLs for the NYC water supply, as noted in the following comments, the NYCDEP states plainly that it has accepted the .05 kg/ha-yr (or .0446 lbs/acre-yr) export coefficient for forests.

In the NYCDEP's Methodology for Calculating Phase II Total Maximum Daily Loads (TMDLs) of Phosphorus for the New York City Drinking Water Reservoirs, March 1999, DEP, page 21, Table 4.2, Phase II Export Coefficients again shows the export coefficient for forests as 0.05 kg/ha-yr (or 0.0446 lbs/acre-yr). However, there is a caveat. DEP states that "The forest category from the land use data also contains an unknown percentage of residential land. ... The number of dwellings present will be derived from Department of Transportation Maps. The forest export coefficient may be proportionally adjusted upwards to account for higher density areas." However, since the phosphorus export coefficient is greater for higher density areas than for pristine forest areas, any

elimination of residences within forest areas would tend to lower the export coefficient from its present value of 0.05 kg/ha-year.

On page 14 of Nonpoint Source Implementation of Phase II TMDLs, April 2001. Prepared by: New York City Department of Environmental Protection and the New York State Department of Environmental Conservation, these agencies state that: “The phosphorus loads for each town represent only the nonpoint source phosphorus loads, based on the land use and the export coefficients used in the Phase II TMDLs (emphasis added).” Clearly, the export coefficients and, in particular the forest export coefficient since so much of the watershed land is forested, underly the evaluation of the TMDLs.

Finally, as further corroboration of the correctness of the 0.05kg/ha-yr, NYCDEC uses this value in its March 2002 Interim Report.^{iv}

Site-specific coefficient values obviously would be preferable to an average value for nearby areas, but that would require several years of intensive monitoring. Lacking site specifics, the average value derived for this area is clearly more reliable than the value derived for Northern Virginia forests.

Further corroboration for the 0.05 kg/ha-yr is provided from studies in connection with the Belleayre Crossroads project, where NYCDEP spent three years to gathering verifiable information on the phosphorus export coefficient for Giggle Hollow, a neighboring forest.^v The study resulted in a phosphorus export coefficient of 0.053 kg/ha-yr (or 0.046 lbs/acre-yr), a level slightly above the 0.05 kg/ha-yr (or 0.0446 lbs/acre-yr) for the EOH watershed. This is to be expected since the EOH watershed is underlain by igneous and metamorphic rock, whereas the West of Hudson (WOH) watershed is underlain by sedimentary rock. According to the afore-mentioned NYCDEP 1996 report, sedimentary rocks have higher phosphorus content than igneous and metamorphic rocks.

To quote from the Seven Springs, June 2008 DEIS: “The site is geologically typical of northern Westchester County. The bedrock is composed of coarsely crystalline metamorphic rock.”^{vi} Further evidence is provided by the following quote: “During three mountain building episodes... the entire region was subjected to the heat and pressure of intense deformation, which resulted in the metamorphism of the sedimentary and volcanic rocks.”^{vii}

(b) Effects of Phosphorus on Water Quality

It is important to be as accurate as possible in evaluating the phosphorus load in the stormwater runoff because a small amount of phosphorus can trigger a very large amount of algae growth, and this could be extremely detrimental, even dangerous, to the viability of Byram Lake as a source of drinking water.

For example, in a communication to NYS DEC on this issue,^{viii} Dr. Fred Lubnow states that: “...it is estimated that one pound of phosphorus can generate up to 1,100lbs of wet algae biomass (slimes, filamentous mats, and/or surface scums).” Further, Dr. Lubnow

states: “Increases in phosphorus loading to a lake also impact the type of algae that dominate the system as well as increase the type of algae. For example, as a lake becomes more phosphorus enriched, it shifts from being phosphorus limited to nitrogen limited. Such a shift favors those algae that can generate their own nitrogen through nitrogen fixation, a biological process where atmospheric nitrogen is converted into usable forms. The only algae that can generate their own nitrogen are the blue-green algae, also known as cyanobacteria. *This group of algae is responsible for the majority of the algal-related problems in freshwater ecosystems (emphasis added).*”

In terms of dry algal mass, 1 lb of phosphorus can trigger the growth of 113.5 lbs of algae.^{ix}

Most detrimental - increases in organic carbon associated with algae in a drinking water source increase the amount of chlorine required in the disinfection process. This, in turn, increases the amounts of disinfection byproducts, most noticeably trihalomethanes and haloacetic acids, some of which are deemed carcinogenic and are limited by Maximum Contaminant Loads (MCL).

(c) Evaluation of Pollutant Loading in Stormwater Runoff

The Pollutant Loading Coefficient Method used by the applicant “shows changes in annual pollutant loading in lbs/acre/year for various pollutants under pre-development and proposed development conditions.”^x However, this method only estimates those pollutant loads generated during storm events. It does not evaluate pollutants carried by base-flow and, therefore, does not estimate the total pollutant load coming off the site. However, for developments that are not intensely urbanized, where considerable areas of the site are not developed as in the Seven Springs proposal, the base-flow can amount to a considerable portion of the runoff volume.

For example, the applicant mentions that “The property serves as the headwaters for three intermittent watercourses, and a number of drainageways and swales, springs and seeps exist within fields and along steep slopes within rock ledge areas.”^{xi} The accompanying maps show a landscape dotted with these manifestations of base-flow.

In such a case, the Pollutant Loading Coefficient Method would not accurately reflect the true conditions that control the amount of pollution coming off the site. More accurate methodologies should be used such as SLAMM (Source Loading and Management Model)^{xii}, or SWMM (Stormwater Management Model)^{xiii}.

Both of these methods allow great flexibility in designing the site plan. Both can be used as planning tools so as to achieve a variety of goals among which, minimizing pollutants in stormwater runoff would be a prime goal. Another goal could be to decrease the amount of earth excavation (estimated at 103,025 cubic yards)^{xiv} and rock excavation (estimated at 38,020 cubic yards)^{xv}, the latter probably requiring blasting. If blasting were used, an analysis of possible damage to existing structures, on-site wells and neighboring wells would be needed.

THE EQUESTRIAN FACILITY

General Description of the Facility: “The equestrian facility will be located in the center of the site on a 4.22-acre lot that encompasses the main cow/horse barn, white farmhouse, caretaker’s house/garage, and carriage barn...The main cow/horse barn will contain spacious stalls for twenty horses...The two open riding arenas will be mucked by motorized paddock vacuums, and the product loaded into a manure fort. To aid this process, avoid mud, protect horses and riders, and protect the environment, the riding arenas will be situated on top of reinforced concrete slabs on ground, drained into the equestrian facility septic/sewer system, and the riding/turnout surface will be composed of sand or decomposed granite... The surface of the arenas will be sand or wood chips, and the substrate will be a material suitable to provide for adequate drainage... There will be no pasturing of horses at Seven Springs.”^{xvi}

It appears that the underlying surface of the riding arenas will be reinforced concrete slabs covered with sand, and either wood chips or decomposed granite; it is not clear which will be used. However, the applicant does not state the depth of either surface cover, an important consideration due to the impact of a hard surface, such as concrete, on the horses’ hoofs and legs.

Another negative aspect is the lack of pasturing. The horses will only be exercised in the ring, or when and if their owners find time to take them out on the Bedford trails. This type of facility is usual for commercial enterprises. However, it is not in keeping with this proposed upscale development that seeks to emulate the standards of Bedford’s equestrian community. Overwhelmingly, Bedford owners allow their horses ample pasture in conformity with §125-25(3) of the Town of Bedford Zoning Code.

In our opinion, the equestrian facility is not acceptable as presented.

REMOVAL OF TREES

Table IIIE-4, Vegetation Impacts^{xvii}, shows that 3.1 acres of Rich Mesophytic Forest and 2.0 acres of Northern Successional Hardwood Forest will be removed from the 80.5 acre Bedford portion of Seven Springs.

The applicant states that “the number of trees to be removed in Bedford may decline in practice, although it is estimated that approximately 875 trees 8"+ dbh will be removed during construction; of these trees, + 105 trees have a dbh of 24 inches or greater.”^{xviii}

This means that an average of close to 11 trees per acre will be removed. However, when the layouts of the individual proposed seven new parcels have been determined, the

average for each parcel could be even higher.

How does this conform with Chapter 112, the Town of Bedford's Tree Preservation Ordinance?

§112-4A states as follows: General Regulations. A tree removal permit will be required before removal of any of the following:

- (7)(b) More than 20 trees on properties of six acres or less and more than four acres.
- (7)(c) More than 30 trees on properties of eight acres or less and more than six acres.
- (7)(d) More than 40 trees on properties of 10 acres or less and more than eight acres.
- (7)(e) More than 50 trees on properties of more than 10 acres.

The seven proposed new properties range in size from just over 4 acres to over 11 acres. Hence, one or more of these properties must fall within the above four categories.

Given the sensitive nature of the area within two watersheds, one, in particular, protecting the sole source of drinking water for an entire community, we strongly recommend that the Bedford Code be strictly adhered to even if it means curtailing some components of the proposed development. The value of trees and forests in protecting water quality and in sequestering carbon dioxide, a main contributor to global warming, cannot be over estimated.

For example, a quote from the USDA Forest Service Northeastern Area states that:^{xix}
“Trees and forests are critical to the health and proper function of watersheds. Studies clearly show that the amount of forest in a watershed, especially those forests bordering streams and shorelines, is an important determinant of water quality and the health of aquatic ecosystems.

Clean water is one of our most important and valuable forest products. In urban areas, trees and forests reduce storm water runoff, cool the air, and provide critical refuge for fish and wildlife. Forests also help clean the air we breathe. In rural areas, forests protect municipal water supplies, reduce flooding, replenish groundwater aquifers, provide recreation and critical fish and wildlife habitat, and yield numerous wood products. By filtering pollutants from air and water, storing water and nutrients, protecting soils, flood plains, and streams, and providing aesthetic and other human needs, forests bring significant benefits to our lands, waters, and communities. People depend on healthy and well-managed forest lands. Over 50 million people depend on northeastern forests, in part, to protect their water supplies. Forests provide a wide range of goods and services we use every day while also making up important "green infrastructure" in our communities, enhancing our health and our quality of life. Forests matter because:

- Forests are the best land use for sustaining water quality
- Forests maintain the stability of streams and watersheds
- Forests provide critical habitats for fish and other wildlife
- Forests clean the air
- Forests protect our drinking water supplies
- Forested watersheds are important to people”

A 1/8/03 article in the NY Times, by Mike Dombeck, chief of the US Forest Service from 1997 to 2001, entitled The Forgotten Forest Product: Water, refers specifically to the NYC watersheds. "...water is perhaps the most important forest product. Forests generate most of the water in the country, providing two thirds of all the precipitation runoff – the water that comes from the sky – in the 48 contiguous states....How do forests produce water? The complex array of trees, shrubs, groundcover and roots slows runoff from rain and snow, and water is purified as it percolates through the soil and into aquifers. By slowing runoff, forests also reduce floods and erosion, minimizing the sediment entering streams and rivers. *Mature forests do their work best (emphasis added)*. They have the best soil and their mixed canopy – a mosaic of open and closed spots among the treetops - allows for snowfall accumulation and eventual runoff. Old trees use less water for growth than young trees do. And as intact forests (emphasis added) better regulate water chemistry and temperatures, they enhance habitat for aquatic species (In many streams this means better recreational opportunities such as trout fishing)....New York City has some of the best water in the world because it maintains healthy forests in its Catskill, Delaware and Croton watershed system..."

In deciding whether or not to allow the destruction of close to nine hundred trees, please weigh carefully whether there is a real need for all the components of the proposed development versus the need for healthy drinking water for millions of people who depend on NYC water, and also the protection of the residents of Mt. Kisco whose sole water supply is threatened by the proposed development.

Furthermore, not to be overlooked is the fact that Bedford is making a serious effort to reduce its carbon footprint. The destruction of a large number of healthy trees to make way for seven McMansions will help undermine that effort.

SOME FURTHER GENERAL COMMENTS AND QUESTIONS

1. The applicant states that "The maximum exposed area at any time during infrastructure construction will not exceed five acres."^{xx} However, under the Stormwater Phase II Program^{xxi} that covers small, regulated MS4s (Municipal Separate Storm Sewer Systems) "...construction site operators must notify the state of any project disturbing one acre or more, prepare a formal written Stormwater Pollution Prevention Plan (SWPPP) and adhere to the provisions of the plan during and after construction." The 38.61 acres of the site that drain to the Kisco River lie within the Croton Watershed. Therefore that portion of the site is a small regulated MS4 that must adhere to the foregoing regulations. The applicant would have to obtain a permit to exceed the allowed one acre maximum exposed area. The applicant's reference to five acres appears to ignore this regulation in the Kisco River portion of the development.
2. Were any of the on-site wells tested for organic and/or inorganic contaminants?

3. Due to the catastrophic consequences for the residents of Mt. Kisco in the event that Byram Lake were contaminated by runoff from Seven Springs, we urge that representatives from Mt. Kisco become members of the Resident Lawn Management Program (RLMP) and the Homeowners' Association (HOA).
4. Since Bedford is engaged in and making great efforts to reduce its carbon footprint, we strongly suggest that any new home or other new building conform to the LEED standards (Leadership in Energy and Environmental Design).

Thank you for your consideration of these comments.

Fay C. Muir. President
CWCWC
9 Old Corner Road
Bedford, NY 10506
914 234-6470

ⁱ Ott *et al*, 1990, NY; Haith & Shoemaker, 1987, NY; Farrow *et al*, 1986, NY; Haith *et al*, 1983, NY; Aylor & Frink, 1980, CT; Schaffner & Oglesby, 1987, NY; Norvell *et al*, 1979, CT; USSCS, 1997, NY.

ⁱⁱ Reducing the Impacts of Stormwater Runoff from New Development, April 1993. See Table 9 – Uncontrolled Nonpoint Pollution Loading Rates (lbs/acre/year). Note that this Table is to be used in conjunction with the Pollutant Loading Coefficient Method. However, the applicant has mislabeled Table IIIC-15, page IIIC-65 that reproduces part of Table 9 as “Simple Method Loading Values”. This is incorrect. The values to be used in conjunction with the Simple Method are expressed in milligrams per liter (mg/l) and are displayed in Table 8, page 39 of “Reducing the Impacts”.

ⁱⁱⁱ See Methodology for Calculating Phase I Total Maximum Daily Loads (TMDLs) of Phosphorus for New York City Drinking Water Reservoirs. Prepared by the Division of Drinking Water Quality Control, Valhalla, New York, June 1996

^{iv} See Nonpoint Source Implementation of the Phase II Phosphorus TMDLs in the New York City Watershed. Interim Report, March 2002.

^v See Appendix C1, page 14 of the Belleayre Crossroads DEIS, 1/12/2004 by EA Engineering, P.C. – <http://www.nyc.gov/html/dep/pdf/belleayre/appendixc1.pdf>

^{vi} DEIS, June 2008, p. IIIA-1 Geology and Soils.

^{vii} DEIS, June 2008, IIIC-1

^{viii} Letter dated April 8th, 2008 from Fred S. Lubnow, Ph.D, Director of Aquatic Programs at Princeton Hydro, LLC to Scott E. Sheeley, NYSDEC Region 3.

p. IIIA-1 Geology and Soils

^{ix} The formula for Algae Mass is 12C106 1H263 16O1 1014N15 31P1 according to

Jack Smith, Ph.D., New York Watershed Phase I Total Maximum Daily Loads/Watershed Allocations/Land Allocations for Phosphorus in the Croton System.

^x Reducing the Impacts of Stormwater Runoff from New Development, April 1993, page 38.

^{xⁱ} DEIS, June 2008, Executive Summary – Surface Water Resources/Stormwater Drainage. Page I-11.

^{xⁱⁱ} wi.water.usgs.gov/slamm

^{xⁱⁱⁱ} www.epa.gov/ednrmrl/models/swmm

^{x^{iv}} DEIS, June 2008, Geology and Soils. Page IIIA-21

^{x^v} DEIS, June 2008, Geology and Soils. Page IIA-16

^{x^{vi}} DEIS, June 2008, Description of Proposed Action. Pages II-33 and II-34.

^{x^{vii}} DEIS, June, 2008. Page IIIE-19.

^{x^{viii}} DEIS, June, 2008. Page IIIE-20

^{x^{ix}} See <http://www.na.fs.fed.us/watershed/index.shtm>

^{x^x} DEIS, June 2008, Description of Proposed Action. Page II-60.

^{x^{xi}} See NYS Stormwater Management Guidance Manual, September 2004, Chapter 1, page 7