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April 10, 2015

Mr. Daniel C. Hill
Hill Law
43 Thorndike Street
Cambridge, MA 02141

Re: Letter report prepared by Northeast Geoscience, Inc. (NGI)

Dear Mr. Hill:

I have reviewed the March 25, 2015 letter report prepared by Northeast Geoscience, Inc. (NGI). My comments are summarized below

1. The test pit and monitoring well data confirms our earlier assessment of the subject property and includes shallow depth to bedrock (refusal) of 9-15 feet, very limited saturated thickness (groundwater in the overburden) of 3-9 feet, shallow depth to the water table (as low as 2 feet beneath the land's surface), and low permeability of 2-24 feet/day. All of these characteristics create significant constraints in siting subsurface wastewater disposal systems.

2. These data indicate that groundwater mounding will be pronounced and raise serious questions regarding Title 5 compliance, specifically with regard to the minimum 4 feet vertical separation beneath the leaching/disposal field and the seasonal high groundwater (water table).

3. The groundwater mounding analysis suggests that there will be only minimal increases in the water table (1-2 feet) as a result of the proposed project. It does not take into account cumulative mounding from stormwater water infiltration and wastewater discharges. This seems very low considering the shallow depth to bedrock, minimal saturated thickness and low permeability.

4. The groundwater mounding model used (TECMOUND) is an unfamiliar application for conducting these analyses and should be reviewed for methodology and assumptions. One item of note is that the duration of wastewater loading used in the mounding analysis is only 30 days, far too short a time for this analysis. The actual steady state mound height and extent will likely be far greater than that calculated after 30 days. I suggest running a

comparative groundwater mounding analysis using the MassDEP-recommended Hantush method to double check the Applicant's input parameters and mounding results.

5. The nitrogen loading analysis also seems to understate the probable impacts of the proposed wastewater discharges. It incorrectly assumes dilution of the proposed wastewater with all of the recharge on the site. MassDEP's recommended method to determine nitrogen concentrations at the down gradient property boundary requires that the proposed wastewater discharge is diluted with only the groundwater that is directly above and down gradient of the discharge area. I have conducted a preliminary nitrogen loading analysis using the MassDEP method at proposed septic area #1 and this shows nitrogen concentrations exceeding 10 mg/liter at the downgradient property boundary.

6. The NGI report uses a solute transport model (AT123D) to estimate downgradient nitrogen concentrations. This model relies upon two additional factors to reduce downgradient concentrations of nitrogen in groundwater - dispersion and decay. Neither of these factors is allowed in the recommended MADEP nitrogen loading model. Both factors are recognized to be minimal/insignificant and can overestimate nitrogen reductions in groundwater.

If you have any questions, please contact me at 508-833-6600.

Sincerely,

HORSLEY WITTEN GROUP, INC.

Scott Horsley
Principal