Scott W. Horsley
Water Resources Consultant
65 Little River Road
Cotuit, MA 02635
Telephone: 508-364-7818

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Jonathan M. Sachs, Chair
Wayland Zoning Board of Appeals
Wayland Town Hall
41 Cochituate Road
Wayland, MA 01778-2614

RE: Cascade Wayland 40B Review/113-119 Boston Post Road

Dear Chairman Sachs and Members of the Board of Appeals:

I have reviewed the Hydrogeologic Report prepared by Geosphere dated June 2, 2018. I have a number of fundamental questions about the report, and contributed to Protect Wayland's letter, submitted to the Board on July 26, 2018, outlining these questions and deficiencies. It is difficult for me (or anyone) to complete a meaningful review of this report until these questions are answered.

One of my major questions is whether, and how, many sensitivity analyses were conducted, which is necessary information to determine the reliability of the modeling outputs. Like any model, there are numerous assumptions about inputs such as permeability, water levels, and flow rates. A series of sensitivity analyses should be presented comparing model outputs (results) by varying each assumed model input independently. This allows the reviewer to determine which assumptions and variables are most important to develop a realistic understanding of the likely impacts.

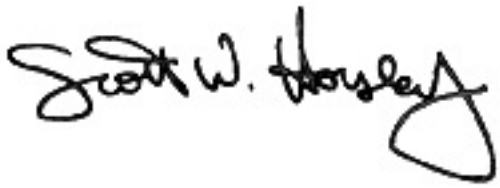
For example, one of the most sensitive variables (inputs) to a MODFLOW model is permeability (hydraulic conductivity). The Geosphere Report (page 5) states, "The hydraulic conductivity for each layer was based on an averaging (rather than a range) of the results of laboratory-derived values from soil sample analyses". Averaging values does not provide a clear picture of the full range of conditions and how the modeling results/outputs are likely to vary if more conservative permeability values (which may, in fact, be more representative of actual subsurface conditions) are used.

For another example, the MODFLOW model was run to simulate the hydrologic effects of wastewater disposal only, without consideration of stormwater infiltration that is also proposed on the project site. In reality, the infiltration of wastewater and stormwater on the same parcel will have "interference effects" and are essentially additive. To accurately evaluate the stormwater component, the model should be run in transient mode to simulate the full range of stormwater infiltration events. This should include the cumulative effects of the chronic smaller storm events, as well as the larger design events (25 and 100-year storms).

Furthermore, the Hydrogeologic Report does not address any of the water quality impacts of the proposed project. As outlined in my previous comment letter, this will include nutrients (nitrogen and phosphorus) and pathogen (bacteria and virus) loading. The Town of Wayland's Health Regulations require that hydrogeologic studies provide adequate information for the Board of Health "to determine that the groundwater and surface water is not compromised". Cleary this would require and evaluation of water quality impacts.

I look forward to completing my review and providing more detailed comments once the questions posed by Protect Wayland are answered, accurate soil test and elevation data are incorporated into the MODFLOW model, and a complete impact analysis (including water quality) is provided.

Sincerely,



Scott Horsley