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June 1, 2022

VIA EMAIL

Robert Gray, Chair
Bourne Conservation Commission
24 Perry Ave
Buzzards Bay MA 02532

Re: 176 Scraggy Neck Road, Bourne, MA

Dear Commissioners:

I have been retained by a group of abutters to the project including Maryfrances Galligan, 170 Scraggy Neck Road; Katherine and Kevin McCarey, 168 Scraggy Neck Road, and Henry Keene (represented by his daughter Susan Malcom) of 11 Winsor Road to review the proposed project at 176 Scraggy Neck Road, Bourne, MA.

I have reviewed the revised site plan (May 16, 2022) and associated documents, and other relevant data and resources published by the Cape Cod Commission, Massachusetts Department of Environmental Protection (MADEP), Massachusetts Coastal Zone Management (MACZM), Massachusetts Geographic Information System (MAGIS), United States Geological Survey (USGS), USDA Natural Resources Conservation Service (NRCS), the Federal Emergency and Management Agency (FEMA) and United States Environmental Protection Agency (USEPA).

Qualifications: I have over 30 years of professional experience in the field of water resources management and on a broad range of water contamination and restoration projects. I have been retained as a consultant to federal, state, and local government agencies, non-governmental organizations (NGOs), and private industry throughout the United States, Central America, the Caribbean, the Pacific Islands, Bulgaria, and China. I have served as an instructor for a nationwide series of U.S. Environmental Protection Agency (USEPA) workshops on wetlands protection, drinking water protection and watershed management. I have also served on numerous advisory boards to the USEPA, the National Academy of Public Administration, Massachusetts Department of Environmental Protection (DEP), Massachusetts Executive Office of Energy and Environmental Affairs (EEA), and the National Groundwater Association. I served as an advisor on the Coastal Resources panel in the development of the Massachusetts Climate Change Adaption Plan. I have received national (USEPA) and local awards for my work in the water resources management fields. I serve as Adjunct Faculty at Harvard University Extension School and Tufts University, where I teach courses in water

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resources policy, wetlands management, green infrastructure, and low impact development (LID). I also served as a consultant to the Cape Cod Commission in the preparation of the 208 Water Quality Plan Update and assisted with the development of nitrogen loading calculations to estuaries.

General Comments: The majority of the project site lies within wetland resources areas. These include salt marsh, coastal banks, and lands subject to flooding. Additionally, four salt ponds surround the site and are hydrologically connected to the site. The proposed project includes the expansion of a septic system with a design flow of 110 gallons/day to 550 gallons/day. My specific comments are as follows.

1. The proposed project and wastewater system does not meet the regulatory setbacks from wetland resources areas. The Massachusetts Wetlands Regulations require that septic systems must meet state and local regulatory setbacks from wetland resource areas. Specifically, they state, *“Minimum Setback Distances, or a greater distance as may be required by more stringent local ordinance, by-law or regulation” (310 CMR 10.03(3))*.

The Town of Bourne has such local regulations and requires a 150-foot setback from wetlands (including coastal banks). The local regulations state, *“a hydrogeologic study, prepared by a hydrogeologist or professional sanitary engineer, will be required by the Board of Health for all leaching facilities within 100 feet of a wetland or watercourse, as defined by 310 CMR 15.01, Title V. In no case shall a septic system leaching facility be placed within 75 feet of a wetland or watercourse, except in cases of repair or extreme hardship”*.

The proposed project shows the septic system 29 feet from the coastal bank (see figure 1). The proposed reserve area is less than 10 feet from the secondary coastal bank.

The proposed septic system is within the 100-foot setback that requires a hydrogeologic study (see figure 2). No hydrogeologic study is provided.

2. The nitrogen loading calculations do not take into account site hydrology and understate the water quality impacts. As stated earlier the project site is surrounded by four salt ponds. These ponds function as groundwater discharge areas. I have prepared the attached graphic to illustrate conceptual groundwater flow patterns (see figure 3). The required hydrogeologic study could document actual site conditions and groundwater flow directions more specifically.

The nitrogen loading calculations provided by the Applicant assume that all the groundwater on the site is mixed (diluting the septic effluent). In reality, the septic system will be located within one of these four groundwater drainage areas and will be only diluted by the recharge within that area. The Conservation Commission’s nitrogen loading form references the Cape Cod Commission’s Technical Bulletin 91-001. This bulletin makes the distinction between applying

the standard 5 mg/liter standard for drinking water and coastal embayments that may have lower standards. It also states that "Nitrogen loading limits for recharge areas to embayments (Marine Water Recharge Areas in the RPP) are referred to as critical nitrogen loading rates.

3. The applicant is required to complete a hydrogeologic study. As stated above the applicant is required to prepare a hydrogeologic study for any septic system within 100-feet of a coastal bank. This hydrogeologic study should identify groundwater flow directions and groundwater drainage areas to the surrounding salt ponds. The hydrogeologic study should also include revised nitrogen loading calculations based upon the site hydrology and only include recharge as dilution within the delineated groundwater drainage area where the septic system is proposed.

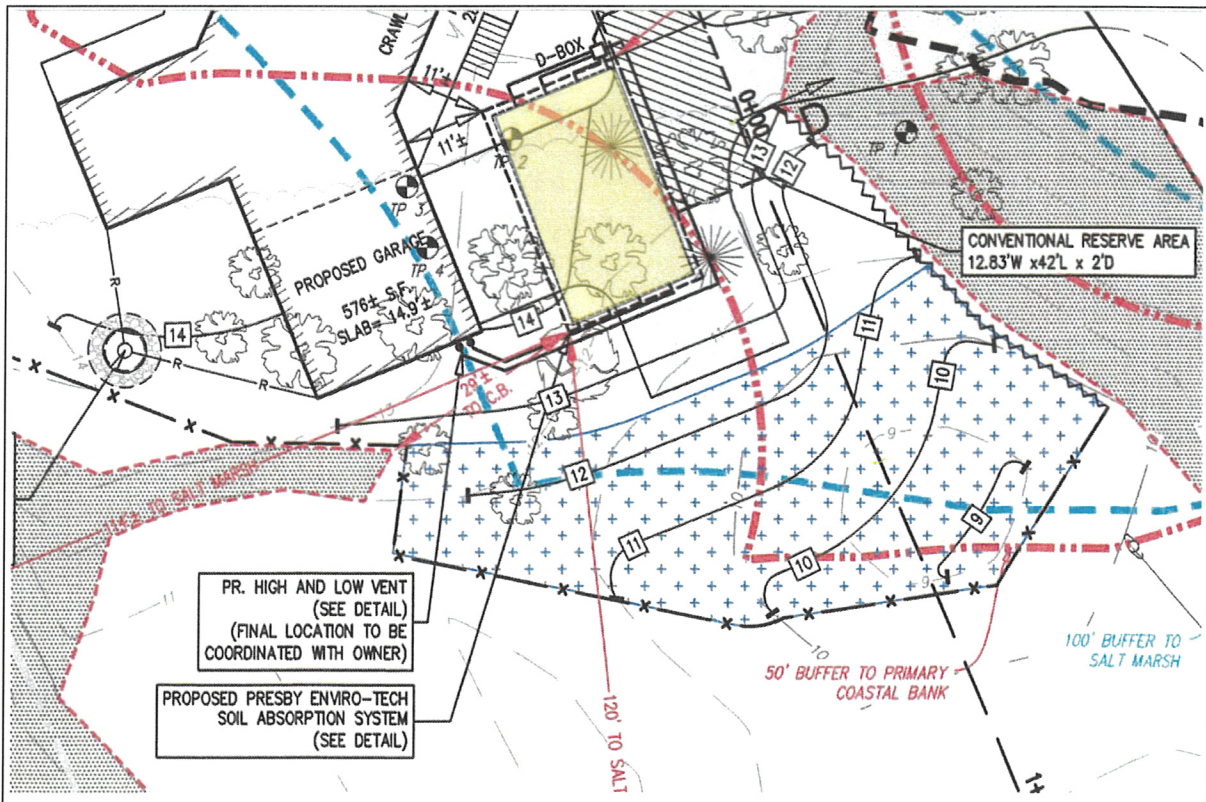


Figure 1 - Proposed Septic System and Coastal Banks

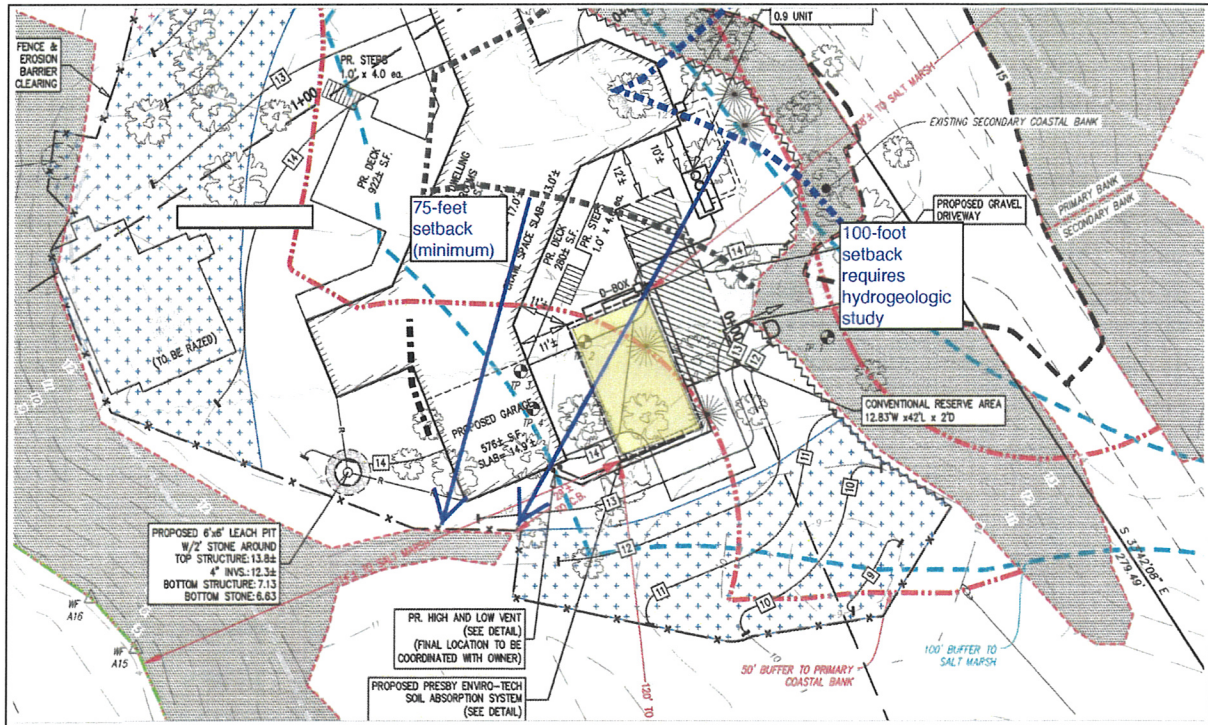


Figure 2 - Proposed Project and Minimum Septic Setbacks



Figure 3 - Conceptual Groundwater Flow Patterns

Thank you for the opportunity to provide these comments. Please contact me directly with any questions that you have.

Respectfully and sincerely,

Scott Horsley
Water Resources Consultant

