

August 25, 2023

Jane Weidman
Town Planner
Town of Charlestown
4540 South County Trail
Charlestown, RI 02813

Re: **Comments on the Conservation Development Policy Proposal**

Dear Ms. Weidman:

Thank you for requesting this letter of comment on a recent proposal for updating the Charlestown's Conservation Development regulations, which are part of the Town's Zoning Ordinance specifically under sections 218-52 and 218-41. The proposed changes are related in part to how yield plans are defined and calculated. These changes will allow for significantly increased density of residential development. I have been asked to comment on the potential environmental implications of the proposed changes, especially as they relate to water quality.

I am a planner and water quality scientist with approximately 30 years of experience. I previously worked as a principal environmental scientist at the Rhode Island Department of Environmental Management (RIDEM) in the Office of Water. For six of the 12 years that I worked at RIDEM, I was the Coordinator of the Nonpoint Pollution Management Program. For the last 18 years, I have worked as a consultant on an environmental and planning projects. I now lead a team of planners at Weston & Sampson. My specific areas of expertise include land-use planning, climate resiliency, onsite wastewater management, wetlands, stormwater, and water supply management.

Surface water and groundwater in Charlestown already experience significant adverse effects from development. In my professional experience, increased density of development invariably results in increased nitrate-nitrogen and pathogens from wastewater and stormwater, even with the most diligent application of best management practices.

The remainder of this letter discusses specific concerns related to the proposed zoning changes. Major concerns that are discussed are as follows:

- Environmental degradation as well as health and safety concerns due the intensity of development in Charlestown have been documented extensively. Water quality impairments were identified as early as the 1990s and these concerns have trended for the worse. Adding density will worsen the problem.
- The proposed zoning changes do not include an analysis of potential harm or an analysis of regulatory alternatives. Charlestown would be well advised to consider both potential harm and regulatory alternatives before adoption.

Conditions in Charlestown

Charlestown is a growing agricultural and residential community, but some areas of town have already been developed beyond environmental carrying capacity. Carrying capacity refers to the natural capacity of land areas to support development without showing signs of environmental degradation. One land-use development threshold for environmental degradation, which is often cited by water quality scientists and land-use planners, is density of impervious surface (e.g., roads, sidewalks, and rooftops) that exceeds 10% of land area. Another threshold commonly used by onsite wastewater management professionals is one dwelling unit relying on an

onsite wastewater treatment system (OWTS) per two acres of land. Much of Charlestown has exceeded both thresholds.

Documentation of related water quality degradation in Charlestown can be found in numerous studies. Some examples include:

- *Determination of Nitrogen Thresholds and Nitrogen Load Reductions for Green Hill and Ninigret Ponds* (RIDEM, 2006)
- *Nitrogen Inputs to Rhode Island Coastal Salt Ponds—Too Much of a Good Thing* (Nixon, S.W. and Buckley, B.A., 2007)
- *Hydrogeology and Simulated Ground-Water Flow in the Salt Pond Region of Southern Rhode Island* (US Geological Survey, 2006)

Moreover, the Town has recently completed its own study of nitrate-nitrogen in groundwater, which provides further evidence of environmental decline due to nitrate-nitrogen inputs related to overdevelopment.

Charlestown's drinking water, which is supplied by a sole source drinking water aquifer, is of particular concern. EPA defines the term sole source aquifer (SSA) as an aquifer that supplies at least 50 percent of the drinking water for its service area and where there is no reasonably available alternative drinking water source were the SSA to become contaminated. In the case of Charlestown, all drinking water comes from an SSA.

EPA has set the maximum contaminant level (MCL) for nitrate-nitrogen in drinking water at 10 parts per million (ppm) due to the potential for nitrate-nitrogen to severely effect human health (e.g., blue baby syndrome). As the level nitrate-nitrogen in drinking water begins to trend upward, the trend becomes more and more difficult to reverse. EPA has also established an action limit for drinking water of 5 ppm, which is intended to prevent environmental conditions from reaching a point of irreversibility. Nitrate-nitrogen concentrations in Charlestown's drinking water already approach 5 ppm in many parts of town and in some cases exceed the action limit.

RIDEM has identified bacterial impairments to several fresh and salt waterbodies in Charlestown, including Green Hill Pond and the Pawcatuck River. Total maximum daily load (TMDL) studies completed by RIDEM and approved by EPA cite sources including OWTS, stormwater, and intensity of land-use development as issues needing attention.

Recommendations

Charlestown may wish to move forward with a change in its Conservation Development regulations despite the environmental implications of doing so. If this is the case, I would recommend considering the following prior making such an update:

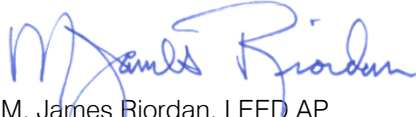
- If the Town wishes to consider more intensive development, it should be done with eyes open. Modeling of environmental resources could be used to build and understanding of likely consequences. I understand that University of Rhode Island (Lorraine Joubert) and the Town (Matthew Dowling) prepared a nitrogen-loading analysis related to onsite wastewater treatment systems in 2014. I would recommend doing an analysis of impervious cover under current and proposed land-use and build-out conditions.
- One policy approach to consider is the use of a performance standard based on potential nitrate-nitrogen contributions from projects as they are proposed. Many communities on Cape Cod and in Southeast Massachusetts, which face similar environmental issues, have adopted—or are considering—such standards. A model policy was developed for the Buzzards Bay area, which can be found at this URL: <https://buzzardsbay.org/wareham/wareham-nitrogen-overlay-draft.pdf>.

I can be contacted at 401-497-6705 or riordanj@wseinc.com if you have questions or would like to discuss the information in this letter.

Thank you for the opportunity to be of service.

Yours very truly,

WESTON & SAMPSON



M. James Riordan, LEED AP
Team Leader