The State of New Hampshire
**Department of Environmental Services**

**Robert R. Scott, Commissioner**

October 21, 2019

Kenneth Moraff, Director
Water Division
USEPA Region 1 – New England
5 Post Office Square
Boston, MA 02109-3912

RE: An Adaptive Nutrient Management Strategy for the Great Bay Estuary

Dear Director Moraff:

The New Hampshire Department of Environmental Services (NHDES) is taking this opportunity to communicate our concerns and thoughts about environmental permitting issues in the Great Bay estuary. Great Bay is one of the 28 estuaries of national significance within the United States and is valued by all of New Hampshire for its environmental, scenic, recreational, and commercial value. Protecting and restoring Great Bay is a core and vital goal, and we value our partnership with Region 1 of the Environmental Protection Agency (EPA) and other federal partners in achieving these goals.

Issue: Great Bay estuary has lost approximately 50% of its historic eel grass habitat. In addition, the estuary has suffered the loss of over 95% of its historic shellfish beds and, in some locations, has low dissolved oxygen which reduces the value of the water as fish habitat. These are unacceptable losses of critical habitats. Published science and field experience show that overloading an estuary with nutrients damages habitat and typically reduces both its extent and resilience. While every estuary is different, and the levels at which significant habitat loss and recovery vary, it is clear that the nitrogen loading levels in Great Bay, although not the only factor, are a significant contributor to habitat degradation, weakening eel grass, and making its loss more certain when it is stressed by physical or other climatological or environmental challenges.

Actions Needed: Overall, EPA is responsible for permitting wastewater treatment facilities in New Hampshire under the National Pollutant Discharge Elimination System (NPDES). In the case of Great Bay, the point source discharge from wastewater treatment facilities has been greatly reduced due to investment in new or upgraded facilities or significant optimization efforts. The communities within the Great Bay estuary watershed have requested that future efforts recognize investments in both further point source reductions *and* nonpoint source (NPS) reductions. NPS reductions not only reduce nitrogen loading but also reduce other forms of contamination (other nutrients, suspended sediments, bacteria, temperature, etc.) that can also inhibit eel grass survival and resilience. Since 2011, the communities and the NHDES have request that EPA permitting should facilitate an adaptive management approach to nitrogen amelioration. Such an approach requires nutrient reductions from a variety of sources, planning, monitoring, tracking, and evaluation.

Critical to adaptive management is setting an initial target level of reduction that provides a significant and improved opportunity for habitat recovery and resilience. We appreciate EPA's efforts to identify and communicate various scientific basis to set this initial target level. NHDES has examined various approaches and recognizes that a loading based approach provides the greatest flexibility to communities. The published research across many estuaries, including Great Bay, suggests that a total annual nitrogen loading of 100 kg/hectare is appropriate as an initial target that would meet state water quality standards (Reference list below). While this is the suggested initial target, application of adaptive management in every permit cycle is essential to continue the review of scientific research and the evaluation of additional tools (such as models) to make sure this is the appropriate long-term target for the program. Similarly, it is essential that a robust mandatory monitoring program is included as a part of the overall permitting effort, and that this effort is used to identify the indications of recovery and resilience being achieved, which could eliminate the need for additional reductions. As a commitment to the importance of the monitoring effort, the Governor and the legislature included funding in the state budget for additional datasondes needed for such a program.

The reduction of nonpoint sources of nitrogen simultaneously addresses many other contamination and hydrologic issues. To this end, an adaptive management plan should include a nonpoint source nitrogen reduction plan that should first identify short-term "low hanging fruit" activities and longer-term actions that could be planned for, budgeted and developed as part of other infrastructure projects. The permit should include clear milestones that demonstrate progress toward the pollution reduction goal. To determine if NPS loads are decreasing, the tracking of best management practices is essential. NHDES, UNH, and the communities have partnered in the creation of a nonpoint source pollution tracking and accounting system to support this approach. The use of this system by the communities around the estuary will ensure accountability into the adaptive management plan.

A final key aspect is the inclusion of conditions under which the adaptive management permit would be re-opened and adjusted for any communities that do not show a clear and demonstrable commitment to the recovery of Great Bay's habitats and adherence to state water quality standards.

Sincerely,

Robert R. Scott
Commissioner

cc. Governor Christopher T. Sununu

References: Hauxwell et al, 2003; Latamer and Rigo, 2010; Valiela and Cole, 2002