To: Marine Resources Committee
From: John Krueger, Northport Maine
RE: March 16 Testimony on LD 586

An Act to Protect Maine Fisheries from the Effects of Industrial Recirculating Aquaculture Operations

Maine is witnessing multiple plans for large aquaculture projects including sites planned for Frenchman Bay, Belfast, Bucksport and Jonesport. Certainly, the possibility of jobs and tax revenue from industrial-sized aquaculture has an appeal. The success of these plans is dependent upon new complex technologies. A concern is that Maine is becoming positioned to be the proving grounds for these new technologies. The industry claims they can build some of the largest-in-the-world fish factories and meet state guidelines, but few guidelines exist and the only recourse is fines if the technologies fail to succeed. The health of the Gulf of Maine is at stake.

To me, the major concern before this committee is how assure that there is a permitting process that both industry and citizenry have confidence it. I believe that the current system is flawed due to multiple departments reviewing the applications and a lack of clear standards by which to permit and enforce. The bill statement that recirculating aquaculture system operation (RAS) may "not contribute to the degradation of water quality or air quality or increase overall carbon emissions" does not feel strong as there is no threshold to define "contribute". A contribution can be any size. How can you measure a contribution to degradation if you do not have a baseline level to begin with? Environmental impact statements, before a permit, are a step in this direction.

I have followed the permitting process for several of the RAS permits and have found the regulatory process to be confusing and the process had the appearance of being highly biased in favor of providing a large corporation sway in the permitting process. The standards for evaluating a permit have either not existed, are weak because the data needed to evaluate is difficult to provide with accuracy, or in one documented case the standards evaluation was changed right before a hearing, contradicting sworn testimony. No Environmental Impact Statement before permitting has been required for any application.

Environmental Impact Statements should be considered before large RAS systems are permitted so a baseline can be established. Also size maters. One example of weakness in the current regulatory process is the inability to verify predictions of how ocean currents affect where pollutants will flow. This determination should happen before the discharge of pollutants takes place. Instead, Maine has asked Nordic and Whole Oceans to only monitor the dispersion of added dye to the effluent AFTER construction and AFTER operating at full capacity.

Our state regulators are underfunded and standards for permits leave significant room for argument. In the case of water discharges there are two approaches for regulators.

> One is "Best Practical Treatment", which should take into account complex emerging technologies such as "Closed Pen" and "Partially Closed Recirculating Aquaculture Systems" or "Zero or Minimal Discharge RAS". Since neither of these are proven at the sizes proposed in Maine, each result in regulators accepting investor promises.
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> Water quality based standards are another tool regulators can use. Maine's weak standards to protect marine waters currently include a (1.) temperature regulation where the exact temperatures before and after construction are uncertain and (2.) difficult-to-verify parameters such as "anti-degradation" and "assimilation" policies. Evaluating these predictions depends on high-tech computer modeling, where results often vary by factors of two, so they need verification and depend again on promises.

If the process approved by Maine regulators for evaluation of the RAS in Belfast is any example, Mainers should be asking a lot more questions about available and proven technologies. Recently acquired Freedom of Information Act (FOIA) documents discussing Nordic illustrate strong corporate lobbying and contacts with government officials. In response, Maine regulators relied on unverified computer modeling and did not review competing technologies that offer minimal pollution.

Large Aquaculture projects are occurring in other states that are demanding technology that reduces environmental risks. West Coast Salmon's plan for a 50,000 metric tons per year land-based salmon farm in the Nevada desert uses a minimal liquid discharge system. I spoke with West Coast Salmon's technology staff and described the Belfast RAS plan to raise 33,000 metric tons per year of

fish while creating 7.7 million gallons per day of liquid waste containing 1,600 lbs. of nitrogen, using enormous amounts of groundwater, and requiring approximately 28 Megawatts of electricity from the region's grid. What would West Coast Salmon's footprint be for the same size as the Belfast production? Their technology would produce 1/10th the wastewater discharge with roughly 1/16th the nitrogen at 1/2 the concentration, and use 1/2 the amount of groundwater while requiring less power. West Coast Salmon is using technology that is currently producing fish successfully at some 50 sites around the world.

A lack of standards and an ability to measure any environmental impact from a large RAS has cost state and town regulators significant time and money, incurred significant costs to citizenry, and weakened the desire and confidence of industries with proven technology to locate in Maine.

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Credentials if Needed:
Two Chemical Engineering Degrees from Massachusetts Institute of Technology
Retired Division Director of Licensing and Enforcement Maine Department of Environmental Protection
Retired Director of Maine's Health and Environmental Testing Laboratory

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NORTHPORT
LD 586

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