Thank you for your response. I feel the concern regarding disease and the need for all farm fish effluent to be treated all of the time was not addressed and some concerns CREC would like further clarification on. CREC would appreciate an answer to the below questions. Thank you.

1. Regarding the BOD, your response was, "The blowers had failed and were not working at the time of the sampling. Since then, the effluent BOD has been tested at 80mg/l. With regular monitoring and maintenance, the effluent BOD will remain below 130mg/l."

What assurances are there, that Browns Bay will conduct regular maintenance and monitoring since they were not aware the blowers had failed?

The blowers were moved from their original location, under the dock, to a location where staff can always hear whether they are operational. It is now part of the daily checks, by their electrician and/or millwright to ensure that the blowers are operational. I have been hired as an independent contractor to inspect and monitor the wastewater system, which includes a monthly inspection of the entire system, to ensure that the system is operating within the requirements of their operating permit.

2. Please address CREC's concern, that to meet the precautionary principle due to the Picine Reovirus being associated to the Heart and Skeletal Muscle disease, by two credible organizations, including the Veterinary Research Journal, farm fish effluent be treated all the time and the concern that If all fish effluent was treated all the time with chlorine, the formation of DBP would be a concern as discussed on page 21 of the Browns Bay Packing Company May,
2013 Technical Assessment, "In discussion of the formation of Disinfection Byproducts (DBP)."

I do not feel that myself, nor anyone else on staff at Brown's Bay Packing is qualified to speak to this, and I am not about to engage in a debate over something that is above my area of expertise. Currently IHNV, BKD, ISA and IP are the pathogens that have been identified, by Industry, as pathogens that require disinfection, and Brown's Bay Packing will continue to disinfect when these pathogens are known to be present or at an elevated risk of being present, such as last year when IHNV was detected on the West Coast. If PRV is added to the list of pathogens requiring disinfection they will disinfect when its presence is known.

The following paragraphs from page 19 of the Browns Bay Packing Company May, 2013 Technical Assessment clearly explains why DBPs are not a concern with the process at Browns Bay Packing:

"The organic precursors to DBPs are primarily humic acids. This is a group of organic acids produced by the biodegradation of plant and animal tissue; they are an important component of fertile soils, and can be found in domestic wastewater collection systems or biological treatment systems with long residence times. The collection system at BBPC is very short, with low residence times in any sump or pipe; at the end of a processing day, all lines and sumps are effectively flushed with clean water. Concentrations of humic acid in the facility's wastewater will be very low or absent. The formation of DBPs is therefore improbable.

The rate of DBP formation in the absence of free chlorine is very slow. This is the main reason why the former practice of over chlorination of wastewater has been replaced with breakpoint chlorination. The chlorine demand of wastewater is not constant; it depends on many factors including the presence of ionic metals, reduced organic matter, and ammonia. Breakpoint chlorination is able to specifically dose batches of wastewater, and ensures that only the minimum amount of chlorine is added to result in the presence of free chlorine. By maintaining a free chlorine concentration less than 0.5ppm, the rate of DBP formation (when the precursors are present) is greatly reduced.

Typically, diseased fish are not being processed, effluent is not chlorinated, and there is no risk

of DBP formation."

3. Please address the increase in risk of a chlorine discharge into the ocean, if the volume of chlorine were to be increased to treat all fish farm effluent, all of the time.

The risk of any chemical discharge increases with increased usage, which is a reason why Brown's Bay Packing only intends to use chemical disinfection when necessary. When chemical usage is required the process will be closely monitored and maintained as per the Operation and Maintenance Manual provided in the Brown's Bay Packing Company, May 2013 Technical Assessment.

4. Why is the color and turbidity of the wastewater stream at Brown’s Bay Packing different than the conditions at the Walcan Seafoods ltd. on the east side of Quadra Island, where UV treatment is used?

It is my understanding that Walcan operates a secondary treatment process that is meant to remove color and turbidity from its waste stream.

5. What changes could be made to the wastewater stream at Brown's Bay, to make UV treatment workable?

Addition of a secondary treatment process.

Thank you for your time, Lorne,