

Wood, Gregg

From: Russell, David
Sent: Tuesday, October 23, 2018 5:21 PM
To: Lewis, Jon; Wood, Gregg
Cc: Nelson, Marcy; Walsh, Michele
Subject: RE: draft permit review- attached diagrams and process flow

Jon,

This afternoon I had a chance to fully review the DEP draft discharge permit found online (link below). Process flow diagrams and facility layout in attachment B indicates that they have plans for incorporating measures, that if incorporated, would address some of the concerns raised at the meeting yesterday. The diagrams indicate multiple barriers for escape prevention, use of UV disinfection units as part of the treatment flow of each RAS unit (possible amplification prevention depend on dose), and use of UV at 50 mJ on the facility effluent. Such a UV dose on the effluent, if incorporated in the design, would be sufficient for destruction of most bacterial pathogens of regulatory concern and some viruses including; ISAV, VHSV, IHNV, but not IPNV. Whether or not the diagrams serve to function as a requirement for effluent UV is a question for Gregg.

<https://www.epa.gov/sites/production/files/2018-10/documents/draftme0037478permit.pdf>

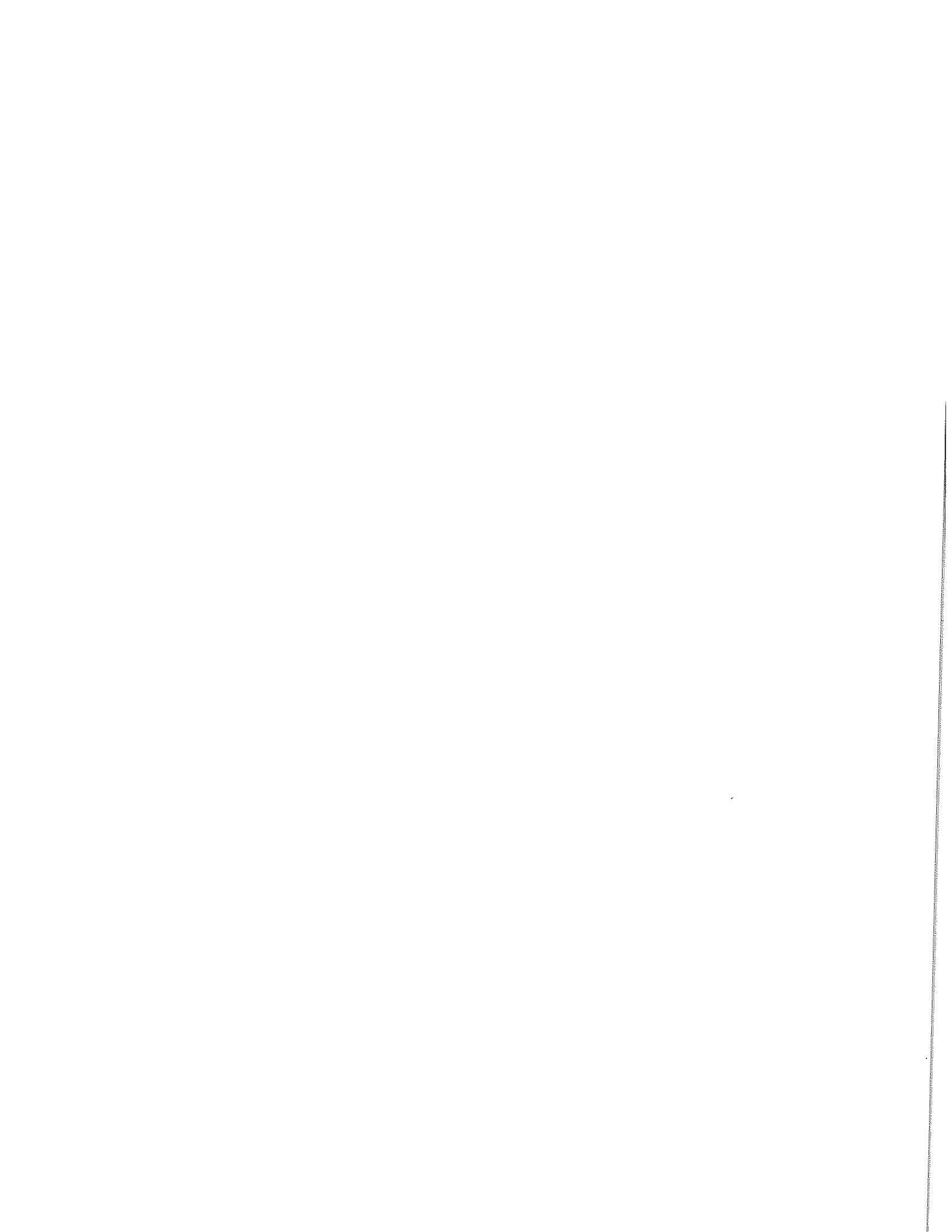
Best regards,
David Russell

From: Lewis, Jon
Sent: Tuesday, October 23, 2018 11:07 AM
To: Russell, David <David.Russell@maine.gov>; Wood, Gregg <Gregg.Wood@maine.gov>
Cc: Nelson, Marcy <Marcy.Nelson@maine.gov>; Walsh, Michele <Michele.Walsh@maine.gov>
Subject: RE: Meeting followup-Antibiotic calculation method

If they are proposing even a lesser amount but still significant antibiotic usage does it not make sense that we should require some sort of disinfection before discharge? Large amounts of antibiotics would seem to imply the potential for a large bacterial load, no?

Jon Lewis
Director, Division of Aquaculture
Maine Dept. of Marine Resources
P.O. Box 8
West Boothbay Harbor, ME 04575
Phone: 207-633-9594
FAX: 207-633-9579
Email: Jon.Lewis@Maine.Gov

From: Russell, David
Sent: Monday, October 22, 2018 2:58 PM
To: Wood, Gregg <Gregg.Wood@maine.gov>
Cc: Lewis, Jon <Jon.Lewis@maine.gov>; Nelson, Marcy <Marcy.Nelson@maine.gov>; Walsh, Michele



<Michele.Walsh@maine.gov>

Subject: Meeting followup-Antibiotic calculation method

Gregg,

Doing some quick calculations with Terramycin 200, the method they used for calculating annual use is apparent. Their calculation does have an error and it uses a method of estimation that grossly overstates need. The label for Terramycin 200 calls for a maximum of 3.75 grams of product to be delivered per 100 pounds of fish per day. Treatment requires 10 days of treatment. Amount in the feed is based off of percent feeding rate of the fish being treated to deliver the aforementioned dose. 5000 MT annual production= 11,000,000 lbs. $3.75g * 11,000,000 \text{ fish} / 100 \text{ lbs of fish} * 10 \text{ days} / 1000 \text{ grams per Kg} = 4,125 \text{ Kg of Terramycin}$. Terramycin is only 44% oxytetracycline(OTC), thus only 1,815 kg of OTC would be used. This calculation for antibiotic use assumes that 100% of all fish are treated once annually at full market weight. Such a calculation is a gross over-estimation for what is needed at the 5000 MT production level, but maybe not too far off the mark in the event that every fish at the facility needs a one treatment when they are at the 20,000 MT production level. An estimate using maximum standing biomass would have been more appropriate. Standing biomass should be about $\frac{1}{4}$ of annual production. Thus a one time treatment as a plug figure would have an estimate that is 25% of what was provided. However if the facility is divided into multiple systems, it is unlikely that everything would need treatment. Thus, even use of standing biomass would result in an excessive figure. Furthermore, treatment is unlikely to be needed unless they are skipping vaccination. My hope is that they are planning on vaccination rather than taking the gamble that loss can be prevented with antibiotics in the event disease strikes.

For perspective, the Norwegian salmon farming industry (pens and land based hatcheries) have an annual production of about 1,250,000 MT. Their annual use of all antibiotics combined is about 212 Kg of antibiotic per year or about 0.17 grams antibiotic per MT of fish production. Norway used much more in the past, but with use of vaccines, they have cut their use by over 98%. On the other hand, Chile has a production of about 895,000 MT of production and uses about 563,200 Kg of antibiotics or 629 grams antibiotic per MT of production. The Whole Ocean estimate of 1,815,000 grams of OTC/5000= 363 grams of antibiotic per MT of fish production. Figure is a bit better if it is applied as a plug figure for full scale production (more realistic for a one time treatment of standing biomass) $1,815,000 \text{ grams OTC} / 20,000 \text{ MT} = 90.75 \text{ grams per antibiotic per MT of fish production}$. This however is just for OTC and not for all 3 antibiotics listed. I assume the anticipated use of the 3 antibiotics were put in as place holders in the unlikely event treatment were ever needed. Treatment if needed, would likely only involve one antibiotic not all 3.

It would be great for Whole Oceans to re-evaluate their anticipated need and to provide better statements clarifying potential use. The current portrayal is that of Chilean net pen culture and such is counter-productive to marketing plans of being land-based. Given that most of the land-based projects have marketing claims of being environmentally friendly and of offering products raised without antibiotics, it is my assumption that they don't have any intention of using antibiotics unless it is absolutely necessary. I am sure that they have great biosecurity and production plans for avoiding disease and the use of antibiotics, and whether it be due to oversight during a rush to get the application out the door or another reason, those plans were not fully conveyed or properly portrayed in the discharge application. They should have put in a plug figure of near 0 and some statements of potentially needing to use the figure they provided in the unlikely event of disease introduction. I assume that the DACF land based aquaculture working group, during review of their license application, will ask questions about biosecurity, vaccination, and so on. What to collect via DACF in association with the LBA working group vs DEP for the discharge permit is something to ponder and discuss. Either way, all the relevant questions should get asked.

Best regards,

David R. Russell

Fish Pathologist

Maine Dept of Inland Fisheries & Wildlife

Fish Health Laboratory

81 Hatchery Road

Augusta ME 04330

(207) 287-2813 office