

Date: October 29, 2018  
Maine Department of Environmental Protection  
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Maine Pollutant Discharge Elimination System (MEPDES) Permit #ME0037478 Maine  
Waste Discharge License (WDL) #W009190-6F-A-N □ **Proposed Draft Permit**

Dear Gregg,

I'm writing to request a hearing and to submit questions and comments regarding the  
Whole Oceans Waste Discharge Elimination System.

1. The historical and recent status of the Penobscot Bay lists it as Maine's largest and most productive fishery and estuary system. It is also noted as one of the most significant estuaries on the eastern seaboard. It can produce high quantities of wild fish, but has been severely mismanaged -- a tragedy to the regional ecosystem, the economy and culture. The waters and rivers have been cleaned considerably since the days of industrial pollution and organic runoff. Many industrial polluters have gone out of business, left the area or reduced their outflow. At this critical time, as migrating fish are just beginning to recover, locating an outflow pipe in the mouth of the Penobscot River is troublesome.
2. The outflow out flow pipe is located deep within the estuary, not even close to deep ocean currents. Can Whole Oceans please provide scientific evidence that the chemistry, nitrogen, and salmon related kairomones and pheromones will have no negative impacts on the River, Bay and its recovery?
3. The aquaculture industry's profits will likely increase as the wild fishery decline. Author Naomi Klein calls this, "Disaster Capitalism," or profiting from disaster, in this case, Maine's fishery collapse is a disaster to the working waterfront, the ecology, and future generations, yet WO business will profit as wild stocks are further damaged. What investments in the wild fish recovery is WO willing to make? And if your facility is found to be hurting recovery efforts, what is WO prepared to do?
4. WO is proposing to dump effluent that is high in nitrogen and pheromones to these fragile, collapsed, yet clean and ready to be restored waters. Should this be a major obstacle to recovery of a wild fishery, what would WO do? A proposal of the scale of WO will change the chemistry of the river and bay. What studies can



you provide that show large scale RAS systems will not effect wild fish recovery, or chemistry of the waters into which the outflow dumps?

5. 2018, CBC news reported "Virus at 2 Nova Scotia land-based fish facilities results in 600,000 salmon being killed... Aquaculture Minister Keith Colwell said Thursday the two facilities are located close to each other, but wouldn't name them." If WO has a disease outbreak, will it be required by law to disclose the location to the public?
6. If WO has a disease or virus outbreak, will the tanks continue to circulate the disease into Penobscot Bay?
7. Will the outflow halt circulation into the river should a virus or disease outbreak in the tanks. Please explain in detail the steps that they would take.
8. How many tanker trucks would be required to empty your tanks?
9. Where would the diseased water go?
10. How would this water be disposed of?
11. Where would the contaminated filters be disposed of?
12. Where would the diseased fish go? Would they be burned? Where?
13. Under any condition, would WO sell diseased fish into the market.
14. Disease Vectors

According to Dr. Stephen Ellis, about 10% of caged salmon are sent to market early because they are diseased with infectious salmon anemia (ISA) virus infections. Aquaculture industry has developed markets for the smaller, yet diseased fish, unbeknownst to the consumer. Can the sold fish, the cartons, or the destroyed fish all spread viruses and diseases?

15. Can you provide scientific studies that prove that your outflow pipe into the bay can unequivocally not spread diseases, viruses or sea lice to other sea life, who then become carriers.
16. Please provide scientific studies that prove UV light is effective in killing viruses and diseases.
17. The food for the fish is a vector for the spread of disease, especially as WO is stating that their feed mix will likely include smaller fish from abroad. Please provide the current protocols for testing for viruses and disease in the fish food.
18. Provide the data on how dissolved phosphorous levels in the outflow pipe change depending upon the diet fed to fish in containment.
19. If you are permitted to discharge certain levels of phosphorus, and later change the diet, will you commit to maintaining target levels?
20. Can the dissolved phosphorous be removed? Will you remove it?
21. A quote from the study in Aquaculture Engineering: "Total phosphorous (most of which was dissolved) was 4 times greater in the culture water of RAS that received the FMF (Fishmeal-free) diet, e.g.,  $4.3 \pm 0.1$  mg/L v.  $0.9 \pm 0.0$  mg/L for the FM (Fishmeal) Diet. This was the first research attempt to formulate a fishmeal-free diet for Atlantic salmon with this ingredient profile and one of few studies to demonstrate uncompromised Atlantic salmon performance when



feeding a diet without fishmeal.” Dissolved Phosphorous levels can increase by four times simply by feeding fish a fishmeal-free diet that contains mixed nut meal, poultry meal, wheat flour, and corn protein concentrate. Could a diet change at a future date cause 4 times the phosphorous to enter the bay?

22. Will feed come from wild fish stock from South America? If so, these species are at the base of the food chain in the areas where they would be harvested at industrial scale. This take would both compete with local small fisher folk and subsistence fishing, as well in other fish up the food chain. What protocols would you have to ensure you will not effect distant communities? Also, people eat the fish that you are using for food. Is this ethical, sustainable?
23. Will you feed fish slaughterhouse waste that includes any of the following: Pig blood or byproducts, chicken slaughterhouse waste, GMO corn, GMO soy?
24. Journalist Mark Hume reported in the Globe and Mail, updated May 11, 2018 “The action, filed with the Federal Court by Ecojustice on behalf of Alexandra Morton, alleges the Minister of Fisheries and Oceans (DFO) acted "unlawfully" by issuing a licence to Marine Harvest Canada Inc. to allow the farm to transfer fish carrying piscine reovirus (PRV).” The virus is deadly and causes heart and skeletal muscle inflammation in fish. “She said she first detected PRV last year when she tested samples of farmed salmon bought at Vancouver supermarkets. The Cohen Commission of Inquiry, which examined the collapse of sockeye stocks in the Fraser, warned that fish farms could be passing diseases to wild salmon. Ms. Morton said PRV could be to blame for the collapse of Fraser stocks.” The Piscine reovirus began in Norway, home to massive aquaculture facilities.

Question: The Aquaculture industry has caused enormous unintended consequences. Can you provide scientific peer reviewed studies not conducted by the industry itself, that can prove that your RAS system’s outflow pipe will not negatively effect wild stocks of fish?

25. Please explain in detail which diseases you will regularly monitor for?
26. What antibiotics and chemicals will be used in the tanks. Can you firmly commit to not using these even in the case of disease outbreaks? What penalties and enforcement can citizens rely on? Will you agree to not using chemicals?
27. Please provide a detailed list of all components, compounds, chemicals, that will be in the effluent and what performance levels you promise to the community.
28. Explain exact levels of disease that would trigger a shut down of flow into the bay?
29. In the event of a mass die off of fish, please provide detailed information that explains your all flows of water, filters, fish, food stocks, equipment, and employees leaving the plant.
30. Can you prove that you will not send diseases into the bay? Please provide documentation on these claims.



31. Can you prove that you will not send viruses into the bay? Please provide documentation on these claims.
32. Sea Lice, kairomones, pheromones -- Studies conducted by the aquaculture industry and researchers have come to understand that salmon pheromones, kairomones and "fish smell" attract sea lice. Although the land-based salmon might be safe from sea lice, the outflow pipe will attract sea lice. How will this effect other species in the bay and wild salmon that are listed as endangered species? Might this make salmon recovery more difficult?
33. Please detail the systems that you will have in place to prevent any tanks or water from being syphoned or inadvertently injected into any wells or surface water.
34. Can you prove that a malfunction of a check valve, a system or an operational mistake, can not lead to contaminated black water from entering the ground.
35. What steps will you take to ensure a tank will not rupture?
36. Will the entire site be bermed incase the tanks ruptured?
37. Detail the physical systems that will contain any spills from a ruptured pipe.
38. Explain what systems are in place should there be an ice storm or other event causing you lose power for several weeks?
39. Will your generator be able to run the entire plant?
40. How many days of fuel will be stored on site?
41. How will you protect this quantity of fuel from an accident?
42. Will there be multiple outflow pipes?
43. What happens if a pipe is plugged or fails?
44. Have you surveyed the habitat in all directions of the plume of wastewater?
45. Please supply records of baseline data of water quality and the species that are within several miles in all directions of your proposed outflow pipe.
46. Much of Maine including Penobscot Bay has many closures due to biotoxins, red tide and toxic algae blooms. Can you prove that your outflow will not add to closures and make the existing problems worse?
47. Is any amount of additional nitrogen into Penobscot Bay acceptable to the marine ecosystem?
  
48. An 11-year study in Port Mouton Bay, Atlantic Canada was released June 28, 2018. "Our results indicate that average market lobster catch per unit effort (CPUE) was significantly reduced by 42% and berried lobster counts by 56% in feed compared to fallow periods. Moreover, both market and berried lobster CPUE tended to be lower in fishing region 2, which included the fish farm, and higher in region 5, furthest away from the farm." The study reported:
  - Lobster "sniff" the odor seascape with their antennules and chemoreceptors found on their legs
  - Odors are used to locate food, find mates, detect predators and avoid environmental stresses
  - Sulphides and ammonium have toxic and behavioural effects on adults and other lobster life stages





– In laboratory studies, 50% of lobsters die within 3.3 days in low oxygen, low sulphides (5.5  $\mu\text{M}$ ) and ammonium (17  $\mu\text{M}$ ) conditions (Draxler et al. 2005)

- Berried lobster are very sensitive to odors and temperature
- Berried lobster show retreat behaviour at 50  $\mu\text{M}$  sulphide (Butterworth et al. 2004); at 500  $\mu\text{M}$  and regular oxygen conditions, 50% of lobster died in 22.5 hr.

Further, the study cited the effects of nitrogen pollution include:

- Decrease in water quality
- Increase in epiphyte growth on eelgrass
- Increase in benthic algae
- Increase in nuisance or “slime” algae

Please take the study’s finding one by one and provide scientific data to show that your outflow pipe will not have similar negative impact.

49. Please detail the quantities of sulphides and ammonium per day in the wastewater.
50. Please provide scientific data to prove that the outflow odor plume will not have any effect on berried lobsters.
51. Please provide details and maps of any eelgrass and/or kelp growth, within the outflow plume.
52. Please provide recent studies regarding the water currents at low depth, mid depth and surface depth on both incoming and outgoing tides as well as under various wind directions and various density profiles of seawater as related to seasonal variations.
53. How does WO plan to dispose of the sludge?
54. How many tons of sludge is expected per year?
55. Will there be a settling pond?
56. If there is a settling pond for sludge, will it be outdoors?
57. What happens if there are hard rains or a hurricane? How will a sludge pond be contained?
58. Can this sludge be a vector for spreading disease to wild fish.
59. If sludge is dehydrated, it takes considerable energy and concentrates the salts. Will it still be useful as an agricultural input?
60. Will sacrifice lands be needed for spreading?
61. In wintertime, with snow on the ground and the ground is frozen, will you spread sludge on the land? Or will you truck the sludge south? What are the impacts to these sacrifice zones? Will the neighbors object to the smell?
62. How will your salmon get their color? Will these chemicals be in the outflow pipe?
63. Will WO tie into the City Sewer system?
64. Are all the outflows included in this stage of the permitting process?
65. Please itemize each component of outflow: RAS system, Smolt operation, fish slaughterhouse waste and water slurry...



66. What are the cumulative impacts on the bay from the combined Belfast and Bucksport facilities?

67. Is WO willing to contractually agree to not use genetically modified salmon?

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