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August 17, 2022

John Ford, Director  
Humboldt County Planning and Building Department  
3015 H St.  
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Humboldt County Board of Supervisors  
825 5th Street  
Eureka, CA 95501

Dear Director Ford and Board Members:

This letter is submitted to initiate appeal of the Nordic Aquafarms, LLC (Nordic) Atlantic salmon Samoa Peninsula Land-Based Aquaculture Project (Project) final environmental impact report (FEIR) certification on August 4, 2022, by the Humboldt County Planning Commission. The Staff Report on the Project concluded: *"The net finding of the EIR is that there are no significant unavoidable impacts associated with the project."*

By this letter, our organizations write to place you on notice that the FEIR for the Project violates the California Environmental Quality Act (CEQA). The FEIR improperly understates the severity of project impacts in multiple domains, including greenhouse gas and energy impacts, existing commercial fisheries, threatened native salmonids, and coastal and bay ecosystems. The undersigned organizations or their members have provided comments on the draft Environmental Impact Report (DEIR) and at the FEIR hearing. We collectively believe that the FEIR has fatal flaws that make it inadequate for final certification.

## THE SIGNATORIES TO THIS LETTER ARE APPEALING THE FOLLOWING ELEMENTS OF THE NORDIC FEIR:

The FEIR erroneously states the emissions from the fish feed do not need to be counted under CEQA.

**Issue:** Fish feed is the major source of greenhouse gases of land-based aquaculture.<sup>1</sup> The Aquaculture Stewardship Council, which Nordic stated in the FEIR they would seek certification from, will *require* Nordic to calculate and report the greenhouse gases emitted by its aquafarm which are due to fish feed.

**Environmental Impact:** Based on publicly available emissions data from fish feed manufacturers and Nordic's projection of 36,000 metric tons of fish feed to be used annually, the emissions Nordic is required to report will be between 80,000 and 190,000 metric tons of CO<sub>2</sub> a year.

The FEIR erroneously says the project will emit "zero" emissions from its electricity consumption.

**Issue:** Nordic has agreed to buy renewable energy for the 195 gigawatt hours it will use annually – as much as Eureka and Fortuna combined. However, the way such purchases are calculated (annually rather than 24/7) means that approximately half of the electricity actually used on an hourly basis will be generated by natural gas.

**Environmental Impact:** Nordic will emit at least 40,000 metric tons of CO<sub>2</sub> annually due to its electricity use.

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<sup>1</sup> These references are cited in context in the combined environmental group response to the DEIR: Cao, Ling, James S. Diana, and Gregory A. Keoleian. "Role of life cycle assessment in sustainable aquaculture." *Reviews in Aquaculture* 5, no. 2 (2013): 61-71; MacLeod, Michael J., Mohammad R. Hasan, David HF Robb, and Mohammad Mamun-Ur-Rashid. "Quantifying greenhouse gas emissions from global aquaculture." *Scientific reports* 10, no. 1 (2020): 1-8; Pelletier, Nathan, Peter Tyedmers, Ulf Sonesson, Astrid Scholz, Friederike Ziegler, Anna Flysjo, Sarah Kruse, Beatriz Cancino, and Howard Silverman. "Not all salmon are created equal: life cycle assessment (LCA) of global salmon farming systems." (2009): 8730-8736; Liu, Yajie, Trond W. Rosten, Kristian Henriksen, Erik Skontorp Hognes, Steve Summerfelt, and Brian Vinci. "Comparative economic performance and carbon footprint of two farming models for producing Atlantic salmon (*Salmo salar*): Land-based closed containment system in freshwater and open net pen in seawater." *Aquacultural Engineering* 71 (2016): 1-12; Ayer, Nathan W., and Peter H. Tyedmers. "Assessing alternative aquaculture technologies: life cycle assessment of salmonid culture systems in Canada." *Journal of Cleaner production* 17, no. 3 (2009): 362-373; Song, Xingqiang, Ying Liu, Johan Berg Pettersen, Miguel Brandão, Xiaona Ma, Stian Røberg, and Björn Frostell. "Life cycle assessment of recirculating aquaculture systems: A case of Atlantic salmon farming in China." *Journal of Industrial Ecology* 23, no. 5 (2019): 1077-1086; Sherry, Jesse, and Jennifer Koester. "Life Cycle Assessment of Aquaculture Stewardship Council Certified Atlantic Salmon (*Salmo salar*)." *Sustainability* 12, no. 15 (2020): 6079; Philis, Gaspard, Friederike Ziegler, Lars Christian Gansel, Mona Dverdal Jansen, Erik Olav Gracey, and Anne Stene. "Comparing life cycle assessment (LCA) of salmonid aquaculture production systems: status and perspectives." *Sustainability* 11, no. 9 (2019): 2517.

The FEIR says that greenhouse gas emissions from refrigerants do not need to be analyzed in the EIR because Nordic will not violate laws or regulations.

**Issue:** Nordic has refused to supply information about the refrigerants it will use in its massive chillers (25% of the energy goes to cooling). The fact that Nordic will follow applicable laws and regulations is (if true) irrelevant to reporting the greenhouse gases the project will emit.

**Environmental Impact:** Unknown but potentially very large as HFC refrigerants commonly used in chillers and for making ice can have a global warming potential of up to 4,000 times that of CO<sub>2</sub> itself. The threshold of CEQA significance in this project for all operational emissions combined is 10,000 metric tons of CO<sub>2</sub>eq<sup>2</sup>. Since the EPA calculates<sup>3</sup> that the average supermarket emits 1,556 metric tons of CO<sub>2</sub>eq per year, it is likely that chillers powered by 48 gigawatt hours a year of electricity (the amount of power Nordic estimates will be used for cooling) will emit far more.

The FEIR used inappropriate methods to calculate the greenhouse gas impacts of vehicle miles traveled by trucks (1.6 million miles annually)

**Issue:** The data used to calculate greenhouse gas emissions from the trucks delivering 36,000 metric tons of fish feed and transport to distant markets of 25,000 metric tons of head off gutted fish are inaccurate. The FEIR used inappropriate software to calculate emissions from vehicle miles traveled out of the county. It did not use ton-miles in its calculations, which is required when calculating emissions for loaded trucks. Preparers of the FEIR admit they did not even have the actual destinations in order to calculate VMT accurately. The federal EPA SmartWay Program encourages haulers to reduce emissions and has software to provide accurate greenhouse gas emissions calculations for trucking firms; the FEIR should be based on this or comparably accurate software.

**Consequences:** It is likely that the greenhouse gas emissions for transportation in the EIR are only a third or less of actual emissions.

The FEIR concluded erroneously: “The No Project Alternative would not result in any significant unmitigable impacts or eliminate any significant unmitigable impacts of the proposed Project, as none exist.”

**Issue:** The No Project Alternative analysis was biased beyond redemption by the substantive errors in the EIR. Given the failure of the FEIR to document the multiple significant impacts of the project, the no-project analysis did not include many significant environmental impacts that might lead to a no-project decision. This is particularly true

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<sup>2</sup> CO<sub>2</sub>eq is a standard way to refer to emissions that are equivalent to CO<sub>2</sub>. So a pound of the refrigerant R507 has the potential to warm the earth as much as 3985 pounds of CO<sub>2</sub>.

<sup>3</sup>

[https://www.epa.gov/sites/default/files/documents/gc\\_averagestoreprofile\\_final\\_june\\_2011\\_revised\\_1.pdf](https://www.epa.gov/sites/default/files/documents/gc_averagestoreprofile_final_june_2011_revised_1.pdf)

in the domain of greenhouse gas emissions and energy, where impacts may not be mitigatable.

**Consequences:** Through the EIR, and derivatively through the staff report, decision-makers were not presented with realistic cost-benefit choices for the project.

The FEIR did not consider as alternatives a small project, or multi-phase modular build-out.

**Issue:** Neither of the alternative ways of structuring the project considered by the FEIR actually deal with the many environmental impacts the FEIR failed to document. The project Nordic proposes is, according to company representatives, entirely modular, with multiple self-contained units. Thus, the obvious alternative, which was proposed by environmental groups multiple times, was to either make the project much smaller or add the modules sequentially over time as the many potential problems were worked out. Although the project is designed in two phases, it is missing a small-project alternative or an adaptive management plan that provides for a phased implementation of the modular units with permission to continue adding modules based on successful performance.

**Consequences:** This project is a massive experiment by a company whose pilot program has only harvested two cohorts and is now no longer going to farm Atlantic Salmon. The Humboldt project is 17 times bigger (in terms of output) than the pilot. The largest land-based Atlantic Salmon farm in the world is only two-thirds the size of this proposal. It has had multiple fish die-offs, cooling failures, and lost \$121 million in 2021. Trade journal articles make it clear that attempting an aquafarm of this size is highly risky as problems increase with scale. Because the EIR did not consider the small-project or multiple-phase modular development these risks were not brought to the attention of decision-makers.

The FEIR makes conclusions regarding threatened species prior to completing formal consultation on Project effects to those species.

**Issue:** No aspect of the Project has undergone formal Endangered Species Act (ESA) consultation. The Project is likely to result in take of eulachon, coho salmon, Chinook salmon, steelhead, green sturgeon that are listed as threatened under the federal ESA. The Project will result in adverse effects to green sturgeon, coho salmon, and eulachon critical habitat as this habitat is listed under the ESA. The Project is likely to result in take of longfin smelt, which is listed as threatened under the California Endangered Species Act (CESA). Of all of these listed entities, only take of longfin smelt is under consultation and that consultation is not likely to be completed until on or after February 2023.

**Consequences:** It is premature to make final effect determinations and to permit the Project without completion of the ESA and CESA consultations. When the National Marine Fisheries Service (NMFS) completes formal ESA consultation on federally listed

species and critical habitat, their biological opinion will include reasonable and prudent alternatives or reasonable and prudent measures. It is premature for the Project to be permitted without inclusion of these alternatives or measures.

The FEIR fails to fully evaluate the potential adverse environmental effects of using up to 10 million gallons per day (MGD) of saltwater sourced from an as yet, unpermitted intake diversion.

**Issue:** Removal of phytoplankton and zooplankton biomass from Humboldt Bay is likely to disrupt the food web and result in fisheries and ecosystem changes.

**Consequences:** There is no certainty that such a diversion of saltwater will be allowed by regulatory authorities. The use of this source of saltwater from the shallow waters of Humboldt Bay will have significant impacts on many marine species during their larval stage including long fin, surf, and night smelt (osmeridae) various flat fish and sole, Pacific herring, sand lance, Jacksmelt (Atherinopsidae), Rock and Dungeness Crab (Zoea and megalops stages), zooplankton, phytoplankton and other essential links in the marine food chain. The economic and environmental impacts of “take” of these marine life forms has not been fully analyzed. Humboldt Bay is an economically important nursery for common, and rare marine resources.

The FEIR uses a “piecemeal” approach to permitting the saltwater intake, which is not allowed by CEQA.

**Issue:** For the purpose of CEQA, this should be a single project. The permitting has been segregated into three distinct parts: (1) the onshore part of the Project and its effluent; (2) the saltwater intakes; and (3) the freshwater intakes.

**Consequences:** The salt water intake of 10 million gallons per day (MGD), and the freshwater intake of 2.5 MGD would not occur **but for** the Project. Leaving the analysis of impacts to third parties, such as the Humboldt Bay Harbor, Recreation, and Conservation District (HBHRCD) and the Humboldt Bay Municipal Water District (HBMWD) does not allow the CEQA decision maker to be provided with the full extent of Project impacts prior to Project certification. The HBHRCD may at some future date obtain a permit to allow the saltwater intakes; however, Project use of that water on the adjacent land-based Project should be analyzed for the impingement and entrainment of larval life forms that will pass through the screened intakes during diversions and for habitat and biomass reduction in Humboldt Bay. Additionally, the HBMWD Habitat Conservation Plan (HCP), which has provisions for take of ESA-listed species in the Mad River, does not address the eulachon, green sturgeon, and coho salmon critical habitat that was listed after the HCP was finalized.

The FEIR fails to conduct a serious, and rigorous alternatives analysis for the seawater intake.

**Issue:** Alternative 3 in the FEIR combined “Fish Selection” with Saltwater intake, and the intakes were given little consideration. Appendix R in the Nordic DEIR clearly informed the HBHRC that the 1997 guidelines produced by National Oceanic and Atmospheric Administration (NOAA) recommend that intakes should be located offshore, when possible, to minimize fish contact. Locating the intakes offshore would minimize the potential adverse environmental impacts of impingement and entrainment of marine life and produce an environmentally superior project. No calculation of cost, or distance offshore was provided in presumptions made indicating that onshore intakes were the only viable alternative.

**Environmental Impact:** Impacts to green sturgeon critical habitat, as well as breeding, feeding, sheltering, and migration habitat for green sturgeon, Chinook salmon, coho salmon, steelhead, eulachon, and longfin smelt could have been minimized by including a Project alternative that followed NOAA guidelines.

The FEIR fails to identify or quantify the amount of ocean sources of fish food that will be utilized in the production of 25,000 metric tons of Atlantic salmon.

Failure to specifically identify the fish food sources makes meaningful analysis of adverse environmental impacts impossible. During hearings before the Humboldt Planning Commission, a Nordic representative dismissed the use of soy-based plant foods for fish production. This leaves the stark reality that the majority of protein fed to Nordic’s Atlantic salmon will be derived from ocean harvest, most likely coastal pelagic species which are the foundation forage fish for marine ecosystems. Any fish food removed from the northern Pacific Ocean is therefore unavailable to native salmon or any other marine predators in the ecosystem. Fish food derived from Atlantic fisheries disrupts indigenous communities and global food supply. To claim that use of “certified sustainable” fish food sources mitigates to below the level of significance is unfounded when the fish meal source has not been identified.

The FEIR makes arbitrary determinations of “less than significant” effects prior to obtaining data, or documenting factual basis for determinations.

**Issue:** Studies to support many of the effect-determinations in the Nordic DEIR have not been completed. The ongoing saltwater intake study by Tenera may be completed by as late as April 2023. Findings of “less than significant” effects, prior to having those effects quantified, are arbitrary. Neither Humboldt County nor Nordic have conducted upwelling modeling to determine the full extent of nitrogen loading and dispersion in the coastal zone and Humboldt Bay. Invertebrate studies have not been completed on the zooplankton community at the saltwater intakes in Humboldt Bay. Baseline monitoring of the marine ecosystem being exposed to project effluent has not been completed.

**Consequences:** Making final determinations on environmental and ecosystem effects prior to study completion is arbitrary.

The FEIR makes arbitrary determinations regarding risk to wild salmon populations.

**Issue:** Arbitrary “less than significant” effect determinations place wild salmonid population at risk of viral exposure from waste effluent water discharges. Abdominal swelling found in Salmonid Alphavirus (SAV), Piscine Orthoreovirus (PRV) Hematopoietic Necrosis Virus (IHNV) is a result of the accumulation virus-laden fluid from lysed or broken cells. None of the methods proposed by Nordic address sequestered viruses or viral accumulation in blood or abdominal fluids. During a viral outbreak, this portion of the wastewater will contain the highest viral loading of the entire effluent stream, because maximum viral loading in salmonids is often in the blood and in the abdomen. Beyond the UV treatment, there is no proposal to treat this fish-killing wastewater for pathogens, no proposed ozone treatment of processing waste fluids, no reverse osmosis treatment, and no proposed monitoring for high-risk pathogens in this waste stream.

**Environmental Impact:** The risk of pathogens escaping the facility and affecting wild salmonids remains high. While incoming water will receive ozone treatment to protect farmed fish in the facility from being introduced to wild pathogens, project effluent will not receive similar treatment to protect wild salmonids. This is of greatest concern in the fish processing area, where blood and body fluids from harvested fish would introduce the highest pathogen load into effluent.

Viruses that are known to occur in farm-raised Atlantic salmon have heavy loads in effluent from factory floors. For example, piscine orthoreovirus (PRV), a virus that originated in farmed salmon, is known to escape into wild salmon populations along this route. Having a veterinarian check the facility twice a year is not the same as monitoring for viral load coming from the facility and factory floor or for ozone treatment of effluent. This problem, combined with the fact that there are no egg sources available that have been proven to be free of PRV, makes the “less than significant” determination unsubstantiated.

The FEIR fails to adequately address domoic acid proliferation that may result from the Project.

**Issue:** The FEIR does not address how localized warming, local currents, tidal flux, and upwelling will contribute to domoic acid outbreaks. The Project will discharge 298 metric tons of nitrogen per year into the Coastal Zone. The FEIR does not include existing upwelling modeling and does not adequately address the risk of marine upwelling and resuspension of Nitrogenous waste in coastal waters.

The FEIR does not take into consideration that localized warming at the outfall pipe combined with nutrient loading from 298 metric tons of Nitrogen per year, would increase the risk of localized domoic acid outbreaks.

**Environmental Impact:** Nitrogen loading and localized warming of about 10°C (GHD 2020a) are likely to foster a reserve population of *Pseudo-nitzschia*, which could lead to longer and more frequent localized spikes in domoic acid production.

The FEIR does not take into consideration the fact that *Pseudo-nitzschia* continues to be present in northern coastal California waters and that *Pseudo-nitzschia* responds very rapidly to localized warming and nutrient loading. Although it is true that domoic acid proliferation is known to be associated with large-scale climate events, the continuing presence of *Pseudo-nitzschia* in coastal waters puts the marine ecosystem at risk from domoic acid events.

Risk posed to the marine fishery is downplayed or discounted in the FEIR. Exposure to viruses, loss of habitat (including food and cover), timing of exposure to toxic chemicals, disruption of migration, thermal pollution, and localized domoic acid proliferation all deserve a harder look in the FEIR. This is especially true for vulnerable species such as green sturgeon, Chinook salmon, coho salmon, steelhead, eulachon, longfin smelt, and Dungeness crab.

**The FEIR fails to address the sandlance spawning habitat in the vicinity of the saltwater intakes.**

**Issue:** The Pacific sand lance are a major prey resource for birds, marine mammals, fishes, and some invertebrates. Variation in the availability of sand lance can have major effects on the breeding success and survival of their predators. The sand lance is an important prey species for threatened coho and Chinook salmon. Rather than address the sand lance spawning beds and wintering habitat that are likely to be disrupted by construction, redevelopment, and operation of the salt water intakes, the FEIR focuses on the percent volume of water diverted by the saltwater intakes and mistakenly likens sand lance habitat to longfin smelt habitat.

**Environmental Impact:** Loss of sand lance breeding habitat and entrainment of sand lance eggs and larvae could have a significant impact on marine bird and threatened salmonid foraging. Until surveys are completed, estimates of the impacts on Pacific sand lance are speculative at best.

## Conclusion

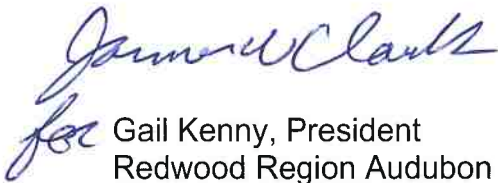
Our organizations have been diligent in our participation in the CEQA process. From early scoping through the Mitigated Declaration, DEIR, public scoping meetings, site visits, office hours meetings, and *ad hoc* presentations, we have consistently and collegially expressed our concerns regarding the lack of adequate analysis, inadequate mitigation, piecemealing, and rush to make determinations prior to study completion.



Because the FEIR fails to identify and mitigate to non-significance the above mentioned significant environmental impacts that are regulated by CEQA, and because the EIR violates procedural CEQA requirements by piecemealing the EIR and moving forward prior to the completion of critical studies, we request the following: 1) Do not Certify the Final Environmental Impact Report (FEIR) prepared for the Nordic Aquafarms California LLC project pursuant to Section 15090 of the CEQA Guidelines, 2) do not adopt the Mitigation Monitoring and Reporting program pursuant to Section 15097 of the CEQA Guidelines, 3) do not make findings for approval of the Coastal Development Permit and Special Permit, and 4) do not approve the Coastal Development Permit and Special Permit for Nordic Aquafarms California.

If Nordic Aquafarms still wishes to pursue a revised EIR and the Coastal Development Permit and Special Permit we ask the Humboldt County Board of Supervisors to instruct the Planning and Building department that the project be returned for consideration only when necessary studies have been completed, the EIR and permitting process reformulated to include the entire project as CEQA requires (instead of piecemealing), and the EIR has been revised to take account of previously ignored significant impacts and then recirculated.

Sincerely,



for Gail Kenny, President  
Redwood Region Audubon  
Society Chapter



Harrison Ibach, President  
Humboldt Fishermen's  
Marketing Association



Daniel Chandler, Ph.D.  
Steering Committee  
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