**CALIFORNIA COASTAL COMMISSION**
NORTH COAST DISTRICT OFFICE
1385 EIGHTH STREET, SUITE 130
ARCATA, CA 95521
VOICE (707) 826-8950

# W11a

**A-1-HUM-22-0063**

**(Nordic Aquafarms California, LLC)**

**December 13, 2023**

## APPENDICES

Appendix A – Substantive File Documents

Appendix B – Substantial Conformance Review Letter & Minor Deviation to Approved CDP from Humboldt County

# APPENDIX A

## Substantive File Documents

1. CDP Application File 9-20-0488 (Applicant: Nordic Aquafarms), including Adopted Findings of Approval, approved 11/16/2023 – staff report and addendum available from the Commission's website: https://documents.coastal.ca.gov/reports/2023/11/Th9b/th9b-11-2023-report.pdf and https://documents.coastal.ca.gov/reports/2023/11/Th9b/Th9b-11-2023-addenda.pdf

2. CDP Application File 1-21-0653 (Applicant: Humboldt Bay Harbor District), filed as complete October 13, 2023

3. Samoa Peninsula Land-based Aquaculture Project Draft Environmental Impact Report (December 17, 2021) and Final Environmental Impact Report (June 30, 2022 (County of Humboldt Planning Department) – available from the County's website: https://humboldtgov.org/3218/Nordic-Aquafarms-Project

4. North Coast Regional Water Quality Control Board adopted Order No. R1-2023-0019 / NPDES No. CA1000003 / WDID No. 1B20161NHUM – available from the Regional Water Board's website: https://www.waterboards.ca.gov/northcoast/board_decisions/adopted_orders/pdf/2023/R1-2023-0019.pdf and the adopted fact sheet: https://www.waterboards.ca.gov/northcoast/board_decisions/adopted_orders/pdf/2023/R1-2023-0019_FS.pdf

5. Substantial Conformance Review Letter from Humboldt County (see App. B)

6. Minor Deviation to Approved CDP from Humboldt County (see App. B)

7. Applicable policies and standards of the Humboldt County certified Humboldt Bay Area Plan (unverified version available from the County's website: https://humboldtgov.org/DocumentCenter/View/50844/Humboldt-Bay-Area-Local-Coastal-Plan and certified Coastal Zoning Regulations (unverified version available from the County's website: https://humboldt.county.codes/Code/31)

# APPENDIX B

1. Substantial Conformance Review Letter from Humboldt County
2. Minor Deviation to Approved CDP from Humboldt County

COUNTY OF HUMBOLDT
PLANNING AND BUILDING DEPARTMENT
CURRENT PLANNING DIVISION

3015 H Street Eureka CA 95501
Phone: (707)445-7541 Fax: (707) 268-3792

July 27, 2023

Ms. Brenda Chandler
CEO Nordic Aquafarms California, LLC
PO Box 1477
Eureka, CA 95502

RE: Substantial Conformance Review for PLN-2020-16698-APPEAL

Dear Ms. Chandler:

This letter is to affirm the proposed changes to the Nordic Aquafarms project substantially conform to the Coastal Development Permit and Special Permit approved for the project and are adequately addressed by the Environmental Impact Report prepared for the project. An application to modify the Coastal Development Permit and Special Permit is not necessary. This determination is based on the facts that the modifications are completely contained within approved building footprints, and do not result in an increase in usage of any resource and do not result in any new impact not previously evaluated.

The approved Coastal Development Permit and Special Permit (Application No. 16698) allowed demolition of the Freshwater Tissue Samoa Pulp Mill facility and construction of a land-based finfish recirculating aquaculture system (RAS) facility consisting of five buildings totaling 766,530 square feet with installation of 4.8 megawatt (MW) solar array mounted on building rooftops, covering approximately 657,000 square feet. A Special Permit allowed an exception to the loading space requirements. The height of the tallest building is 60 feet. The facility was evaluated to have an annual production capacity of 25,000-27,000 metric tons of Head on Gutted (HOG) fish once complete. The species identified in the permit and EIR was Atlantic Salmon. The permit allowed ancillary support features such as paved parking, fire access roads, security fencing, and stormwater management features. The project was evaluated to use 2.5 million gallons of freshwater per day provided by the Humboldt Bay Municipal Water District. The project was evaluated to use10 MGD of salt water, provided from upgraded sea chest infrastructure located adjacent to the NAFC Project Site, which will be operated by the Humboldt Bay Harbor, Recreation, and Conservation District. Treated wastewater would be discharged utilizing the existing Redwood Marine Terminal II ocean outfall pipe, which extends one and a half miles offshore. A total volume of 12.5 MGD was evaluated as a discharge volume.

Nordic Aquafarms California, LLC (NAFC) proposes the following changes to the approved project (Attachment 1):

1. Change fish species from Atlantic salmon (Salmo salar) to Yellowtail Kingfish (Seriola lalandi).

2. Construct a smaller facility, a minimum of ~75,000 SF building footprint reduction.
3. Reduced truck traffic due to reduced material goods during operation, and reduced construction intensity.
4. Cooler effluent: Under Atlantic salmon the facility would have discharged 21°C effluent 365 days per year. Yellowtail Kingfish are reared in warmer water; however, heat exchangers will be used to warm the tank water and cool the effluent water. Information and modeling have been submitted demonstrating the temperature of the effluent water will not be warmer than that modeled for Atlantic Salmon.
5. Reduced energy needs: An estimated total reduction at full build out of ~70 GWh per year, or a~36% reduction.
6. Increased salinity of effluent from 26.8 to ~31 PSU. Approximately 4 PSU closer to the salinity of the receiving water body.
7. Reduced effluent volume from 12.5 million Gallons per Day to 10.3 MGD. A 2.2 MGD reduction.
8. Reduced GHG emissions (direct and indirect).

We have reviewed the changes and find them to be within the parameters of the approved permits and analysis provided by the EIR. No buildings are being relocated, one building is being reduced in size. The reduction in building size will allow an existing occupied building to remain which will allow those tenants to not be relocated. This is a net reduction in impacts. The change is species overall has a reduction in impacts reviewed as part of the permit and evaluated in the EIR. The primary concern evaluated in the EIR was the temperature of the water used to rear Yellowtail and the potential for increased water temperature of the effluent. This is addressed using heat exchangers which will have an overall net reduction in environmental effects.

We understand the project modification would include reduction of production from 25,000-27,000 metric tons of Head on Gutted (HOG) fish annually, to 3,000 metric tons of HOG fish for phase one, and 15,000 metric tons of HOG fish annually at full buildout. The proposed modification would result in the following reductions:

| | |
|---|---|
| Feed | 20,250 MT, **reduction of ~13,000 MT (-39%)** |
| Energy Use | 125 GWh per year, **reduction of ~70GWh per year (-36%)** |
| Freshwater Use | No longer needed for production. **300,000 gallons for processing only (-88%)** |
| Saltwater Use | No change, 10 MGD |
| Wastewater Discharge | 10.3 MGD, **reduction of 2.2 MGD (-18%)** |

The reduction in facility size and HOG fish production equates to less feces, feed use, and overall nutrient load within effluent discharge (Attachment 2 - GHD (2023) Samoa Peninsula Land-Based Aquaculture Numerical Modeling Report).

*Table 1* *Discharge and mass fluxes of the updated and original projects.*

| Parameter | Values | | | Comment / Assumption |
|---|---|---|---|---|
| | Updated | Original (GHD 2021) | % Reduction | |
| Discharge | 10.3 MGD | 12.5 MGD | 17.6% | Updated project specification |
| $NO_X$ | 555 kg/day | 729 kg/day | 23.9% | Assume entire project specification load of TN is $NO_X$ |
| Temperature | 68°F | 71.4°F | 5% | Updated project specification |
| Salinity | 31 PSU | 26.8 PSU | -16% (increase) | Updated project specification |

The data provided is evidence of conformance with the Thermal Plan, which modeled peak effluent temperature approximately seven degrees above ambient water temperatures, nitrogen levels remaining far below regulatory requirements, and salinity remaining lower than ambient waters.

A review of the proposed changes finds that the changes do not increase the likelihood of impacts, but rather lessens potential impacts, which are already mitigated to a level of Less than Significant.

This letter confirms that the requested changes are consistent with the approved permit. If this letter misunderstands or misstates anything, please contact me with clarifications.

Sincerely,

John H. Ford
Director of Planning and Building

Attn: Cade McNamara, Associate Planner
Humboldt County Planning and Building Department
(707) 268-3777
cmcnamara@co.humboldt.ca.us

cc:

Melissa Kraemer, California Coastal Commission
Cassidy Teufull, California Coastal Commission
Randy Lovell, California Department of Fish and Wildlife

PLANNING AND BUILDING DEPARTMENT
COUNTY OF HUMBOLDT
CURRENT PLANNING DIVISION

3015 H Street, Eureka, CA 95501
Phone (707) 445-7541 • Fax (707) 268-3792
http://www.humboldtgov.org/156

California Coastal Commission
1385 8th Street, Ste 130
Arcata, CA 95521

# Notice of Final Action Taken

**Date:** October 19, 2023 **Appealable Status** Non-Appealable

**Applicant:** Nordic Aquafarms California, LLC
Attn: Brenda Chandler
PO Box 1477
Eureka, CA 95502

**Assessor Parcel Number:** 401-112-021-000

**Record Number** PLN-2023-18699

**Contact:** Cade McNamara - 268-3777

**Description**
The project description for the Coastal Development Permit and the Special Permit is as follows:
A Coastal Development Permit and Special Permit for demolition and remediation of the Samoa Pulp Mill facility and construction of a land-based finfish recirculating aquaculture system (RAS) facility. This includes development of five buildings totaling **691,530**square feet and installation of an approximately 4.8 megawatt (MW) solar array mounted on building rooftops, covering approximately 657,000 square feet **which may be reduced by up to 10% in area**. A Special Permit is required pursuant to HCC Section 313-109.1.5.2 for an exception to the loading space requirements. The height of the tallest proposed building is 60 feet. The project will be constructed in three phases: Phase 0 will involve demolition and site preparation. Phase 1 will include intake and outfall connections, hatchery building. Phase 1 grow-out modules, fish processing and administration building, central utility plant, Intake water treatment, wastewater treatment building, backup systems plant, oxygen generation plant, and utility and infrastructure installation and Phase 2 will consist of Phase 2 grow-out module construction. The aquaculture facility would produce fresh head on gutted fish and fillets for delivery to regional markets. The species produced at the facility is intended to be **Yellowtail kingfish (Seriola lalandi) and has been approved by** CDFW through their aquaculture registration process. The Project will include ancillary support features including paved parking, fire access roads, security fencing, and stormwater management features. The Project would require approximately **0.3** million gallons per day (MGD) of freshwater provided by the Humboldt Bay Municipal Water District, sourced from the Mad River. Existing on-site water service supplied by the Humboldt Bay Municipal Water District would be connected to the new buildings for potable use, fire sprinklers, and irrigation. The Project would require approximately 10 MGD of salt water, which will be provided by upgraded water intake infrastructure located adjacent to the NAFC Project Site, on Humboldt Bay. Treated wastewater would be discharged utilizing the existing Redwood Marine Terminal II ocean outfall pipe, which extends one and a half miles offshore. A total of **10.3** MGD would be released daily.

**Action Taken**
Following Administrative Review the County of Humboldt Administrative Director approved the referenced application on October 19, 2023.

**Appeal Completion**
The appeal period for this project has been completed and no appeal was received.

**CURRENT PLANNING DIVISION**
**PLANNING AND BUILDING DEPARTMENT**
**COUNTY OF HUMBOLDT**

3015 H Street, Eureka, CA 95501
Phone (707) 445-7541 • Fax (707) 268-3792
http://www.humboldtgov.org/156

| Applicant | Owner | Agent |
|---|---|---|
| Nordic Aquafarms California, LLC<br>Attn: Brenda Chandler<br>PO Box 1477<br>Eureka, CA 95502 | Humboldt Bay Development Assn Inc.<br>Attn: Larry Oetker<br>PO Box 1030<br>Eureka, CA 95502 | GHD<br>Attn: Andrea Hilton<br>PO Box 1010<br>Eureka, CA 95502 |

# Notice of Administrative Decision

**Date** October 19, 2023

**Assessor Parcel Number:** 401-112-021-000

**Record Number** PLN-2023-18699

**Contact** Cade McNamara - 268-3777

**Description**

The project description for the Coastal Development Permit and the Special Permit is as follows:
A Coastal Development Permit and Special Permit for demolition and remediation of the Samoa Pulp Mill facility and construction of a land-based finfish recirculating aquaculture system (RAS) facility. This includes development of five buildings totaling **691,530**square feet and installation of an approximately 4.8 megawatt (MW) solar array mounted on building rooftops, covering approximately 657,000 square feet **which may be reduced by up to 10% in area**. A Special Permit is required pursuant to HCC Section 313-109.1.5.2 for an exception to the loading space requirements. The height of the tallest proposed building is 60 feet. The project will be constructed in three phases: Phase 0 will involve demolition and site preparation. Phase 1 will include intake and outfall connections, hatchery building. Phase 1 grow-out modules, fish processing and administration building, central utility plant, Intake water treatment, wastewater treatment building, backup systems plant, oxygen generation plant, and utility and infrastructure installation and Phase 2 will consist of Phase 2 grow-out module construction. The aquaculture facility would produce fresh head on gutted fish and fillets for delivery to regional markets. The species produced at the facility is intended to be **Yellowtail kingfish (Seriola lalandi) and has been approved by** CDFW through their aquaculture registration process. The Project will include ancillary support features including paved parking, fire access roads, security fencing, and stormwater management features. The Project would require approximately **0.3** million gallons per day (MGD) of freshwater provided by the Humboldt Bay Municipal Water District, sourced from the Mad River. Existing on-site water service supplied by the Humboldt Bay Municipal Water District would be connected to the new buildings for potable use, fire sprinklers, and irrigation. The Project would require approximately 10 MGD of salt water, which will be provided by upgraded water intake infrastructure located adjacent to the NAFC Project Site, on Humboldt Bay. Treated wastewater would be discharged utilizing the existing Redwood Marine Terminal II ocean outfall pipe, which extends one and a half miles offshore. A total of **10.3** MGD would be released daily.

**Decision**

The project was approved by Administrative Review on October 19, 2023

and is subject to the attached Conditions of Approval.

**Conditions of Approval**
Please review these conditions carefully as other permits may be required before the project commences. In accordance with County Code, this approval may be revoked or rescinded, in whole or in part, if certain grounds are found to exist (See Humboldt County Code §312-14).

**Effective Date**
The effective date of the original permit remains in full effect.

**Expiration Date**
The expiration date of the original permit remains in full effect.

**Extensions**
If the conditions for your project cannot be met before the expiration date, you may apply for an extension with the Planning Division. Extension applications must be submitted with the appropriate fees before the permit expiration date. If the permit expires, a new permit application must be filed and accompanied by applicable fees. The new permit may be subject to different processing requirements and standards. Contact your assigned planner if you have any questions about extensions.

**Changes or Modifications to Project**
If your project needs minor changes or major modifications, review and approval of the project by the Planning Division is required. Applications for changes or modifications must be filed and accompanied by applicable fees. Contact your assigned planner if you think your project needs to be changed or modified.

COUNTY OF HUMBOLDT
PLANNING AND BUILDING DEPARTMENT
CURRENT PLANNING DIVISION

3015 H Street Eureka CA 95501
Phone: (707)445-7541 Fax: (707) 268-3792

## MINOR DEVIATION TO AN APPROVED COASTAL DEVELOPMENT PERMIT AND SPECIAL PERMIT

**Background:**

On September 28, 2022, Humboldt County Board of Supervisors approved a Coastal Development Permit and Special Permit (PLN-2020-16698), and certified an Environmental Impact Report (EIR) pursuant to the California Environmental Quality Act (CEQA), for Nordic Aquafarms to allow:

*A Coastal Development Permit and Special Permit for demolition and remediation of the Samoa Pulp Mill facility and construction of a land-based finfish recirculating aquaculture system (RAS) facility. This includes development of five buildings totaling 766,530 square feet and installation of a 4.8 megawatt (MW) solar array mounted on building rooftops, covering approximately 657,000 square feet. A Special Permit is required pursuant to HCC Section 313-109.1.5.2 for an exception to the loading space requirements. The height of the tallest proposed building is 60 feet. The project will be constructed in three phases: Phase 0 will involve demolition and site preparation. Phase 1 will include intake and outfall connections, hatchery building, Phase 1 grow-out modules, fish processing and administration building, central utility plant, Intake water treatment, wastewater treatment building, backup systems plant, oxygen generation plant, and utility and infrastructure installation. Phase 2 will consist of Phase 2 grow-out module construction. The aquaculture facility would produce fresh head on gutted fish and fillets for delivery to regional markets. The species produced at the facility is intended to be Atlantic Salmon, pending approval from CDFW. The Project will include ancillary support features including paved parking, fire access roads, security fencing, and stormwater management features. The Project would require approximately 2.5 million gallons per day (MGD) of freshwater and industrial water provided by the Humboldt Bay Municipal Water District, sourced from the Mad River. Existing on-site water service supplied by the Humboldt Bay Municipal Water District would be connected to the new buildings for potable use, fire sprinklers, and irrigation. The Project would require approximately 10 MGD of salt water, which will be provided by upgraded water intake infrastructure located adjacent to the NAFC Project Site, on Humboldt Bay. Treated wastewater would be discharged utilizing the existing Redwood Marine Terminal II ocean outfall pipe, which extends one and a half miles offshore. A total of 12.5 MGD would be released daily. The EIR evaluated all phases of project development.*

**Project:** Nordic Aquafarms California requests to make the following changes to the approved project:

1. Change fish species from Atlantic salmon (Salmo salar) to Yellowtail kingfish (Seriola lalandi).
2. Construct a smaller facility, a minimum of ~75,000 SF building footprint reduction.

This requested Minor Deviation is supported by the following Attachments:

1. Request for changes to the proposed Nordic Aquafarms California Project (May 12, 2023).
2. GHD Report: Estimates of Changes to the Predicted Zone of Water Quality Degradation from the Updated Project Design (July 14, 2023).

The smaller facility and change in species would result in the following changes to factors evaluated as part of the Coastal Development Permit and EIR:

a. Reduced truck traffic due to reduced material goods during operation, and reduced construction intensity.
b. Cooler effluent: The project considered in the EIR would have resulted in maximum discharge peaks of 21°C effluent several days per year when seawater temperature peak. With the revised project, heat exchangers will be used to warm the tank water and cool the effluent water, resulting in cooler effluent (maximum of ~20°C several days per year).
c. Reduced energy needs: An estimated total reduction at full build out of ~70 GWh per year, or a~36% reduction.
d. Increased salinity of effluent from 26.8 PSU to ~31 PSU. Approximately 4 PSU closer to the salinity of the ambient receiving seawater body, which is roughly ~33.5 PSU.
e. Reduced effluent volume from 12.5 million gallons per day to 10.3 MGD. A 2.2 MGD reduction. The reduction will result from no freshwater being used in the fish tanks.
f. Reduced GHG emissions (direct and indirect) as a result of reduced energy use and truck traffic.

**Project Location:** The project is located in the Samoa Area, east of Vance Avenue, approximately 2,000 feet north from the intersection of Vance Avenue and Bay Street, on the property known as 364 Vance Avenue.

**Present Plan Designations**: Industrial, Coastal Dependent (MC), Density: N/A; Industrial, General (MG), Density: N/A; Humboldt Bay Area Plan (HBAP), 2017 General Plan, Slope Stability: Relatively Stable (0) and Moderate Instability (2).

**Present Zoning:** Industrial, Coastal Dependent (MC)

**Record Number:** PLN-2023-18699

**Assessor Parcel Number**: 401-112-021-000

| **Applicant** | **Owner** | **Agent** |
|---|---|---|
| Nordic Aquafarms California, LLC<br>Attn: Brenda Chandler<br>PO Box 1477<br>Eureka, CA 95502 | Humboldt Bay Development Association Inc.<br>Attn: Larry Oetker<br>PO Box 1030<br>Eureka, CA 95502 | GHD<br>Attn: Andrea Hilton<br>PO Box 1010<br>Eureka, CA 95502 |

**Environmental Review:** An EIR was prepared pursuant to the California Environmental Quality Act (CEQA) Statute (Public Resources Code 21000–21189) and Guidelines (California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000–15387), and certified by the Board of Supervisors on September 28, 2022 (SCH# 2021040532).

The changes outlined in this Minor Deviation are consistent with the EIR. The environmental impacts of the Project with this Minor Deviation are within the scope of the impacts analyzed in the EIR. Attachment 1 includes an analysis of the potential impacts of the proposed changes. Attachment 2 models the potential impacts from the effluent associated with the change. With the Minor Deviation, all of the

impacts from the project would either remain the same or be reduced as compared to the Project that was evaluated in the EIR.

**Findings**

Pursuant to Humboldt County Code Section 312-11.1.4, a minor deviation from an approved plot plan may be approved and issued by the Planning Director if, based on the submitted information provided by the applicant, the Director finds that:

1. ***The deviation does not constitute a substantial change in the variance or development.***
   The changes to the permit qualify for a minor deviation based on the following:

| Proposed Change | Findings |
|---|---|
| Reduction in facility size and associated solar array. | The smaller facility will be a building footprint reduction of approximately 75,000 square feet (-9.8%) for Building #1. Building #1 was to host a portion of the solar array, proposed to spread across facility building tops. Nordic has not yet made exact calculations for their solar array deduction, but it is assumed to be at the same or similar ratio, given space. The buildings will remain in the same location as those approved and the deviation in size of solar array may be reduced by up to 10% in area. No substantial change. |
| Reduced production of Head on Gutted Fish (HOG). | Reduction of Head On Gutted fish from 27,000 metric tons annually to 15,000 metric tons at full buildout. A production reduction of ~12,000 metric tons (-44%). Phase one will produce ~3,000 metric tons annually. No substantial change. |
| Change of Species from Atlantic Salmon (Salmo salar) to Yellowtail Kingfish (Seriola lalandi). | The EIR analyzed Yellowtail kingfish (Seriola lalandi) as a species alternative and concluded that, compared to raising the same amount of Atlantic salmon, Yellowtail kingfish would require either a larger amount of water for cooling or much higher energy use to cool discharge water in order to comply with regulations. Nordic Aquafarms California represents that since the EIR was certified, new information, including changes in market conditions, pertaining to the land-based production of Yellowtail kingfish has become available which makes operation of a smaller-scale Yellowtail kingfish farm (compared to what was analyzed in the EIR) feasible. Empirical data provided by the applicant has identified that: (i) Yellowtail kingfish grow to market size faster than Atlantic salmon, and (ii) reduced energy per kg would be required for Yellowtail kingfish relative to Atlantic salmon.<br><br>A permit for species selection has been issued through the Department of Fish and Wildlife's aquaculture registration process for Yellowtail kingfish (Seriola lalandi).<br><br>Production of Yellowtail kingfish on a smaller scale than what was analyzed in the EIR, as proposed, would reduce |

| | |
|---|---|
| | environmental impacts from the project. No substantial change. |
| Egg Stock | Egg stock and juvenile fish will no longer be transported to the site. There is no third-party commercial supplier of Yellowtail kingfish eggs. Nordic Aquafarms has its own successful Yellowtail kingfish hatchery in Denmark (Maximus A/S) which they aim to replicate in California. The facility will operate its own broodstock and hatchery site within the fully contained/secured structures and tanks approved in the original project proposal. |
| Reduced water use. | No longer using freshwater for fish production. Reduction of 2.2 million gallons daily (MGD). 300,000 gallons of freshwater will still be used for processing annually. No substantial change. |
| Reduced of feed. | Now using 20,250 metric tons (MT) of feed. A ~13,000 MT reduction annually (-39%). No substantial change. |
| Reduced effluent volume. | Less water usage directly correlates to less effluent. Effluent discharge will be reduced by 2.2 MDG. No substantial change. |
| Reduced energy use. | Yellowtail kingfish requires warmer waters than Atlantic salmon. The change in species will reduce the use of, and likely eliminate the need for chillers to cool the facility's water, reducing energy use by ~70GWh per year (-36%). Nordic Aquafarms California is now anticipated to use 125GWh per year of renewable energy (RCEA power mix). No substantial change. |
| Reduced truck traffic. | Reducing the production and the size of operation means that there will be less truck traffic associated with the project for both short hauling and long hauling. Less feed, less waste and waste delivery, and less shipping of product. No substantial change. |
| Reduced GHG. | A reduction in size reduces GHG emissions associated with construction of additional building area. Less truck traffic reduces emissions associated with VMT. Less energy consumption reduces use of locally available renewables. No substantial change. |

All of the proposed work will occur within the approved development footprint analyzed within the EIR prepared for the project (SCH# 2021040532) and constraints of the Coastal Development Permit and Special Permit (PLN-2020-16698) approved for Nordic Aquafarms California. There are no changes to the findings made within the approval process nor will there be any changes to mitigation measures, conditions of approval, or commitments by the applicant.

***2. The deviation will not adversely affect adjacent property or property owners.***

a. The project meets the necessary setbacks from the parcel boundaries.

b. Smaller building size (Building #1) with fewer truck trips and production, will lessen the potential for effects on adjacent property or property owners. Reduction in building footprint will allow existing tenants to remain, therefore tenant relocation is no longer required.

c. The proposed deviation will not impact any sensitive receptor any more than the approved project.

d. The proposed deviation, as compared to the Project in the EIR, will not adversely affect adjacent property or property owners.

***3. The deviation does not affect the conformity of the plot plan with permit conditions.***

The approval of this minor deviation will result in a site plan revision (Attachment 2, Exhibit A). The deviation proposes a reduction in the building footprint of Building #1 by ~75,000 square feet. None of the proposed changes will affect the conformity of the plot plan with the permit conditions of PLN-2020-16698. There is no reconfiguration occurring. The existing building hosting tenants, operations by Humboldt Bay Development Association Inc., will remain and tenants will no longer need relocation. The original Conditions of Approval are not altered in any way and remain the same as approved by the Board of Supervisors on September 28, 2022.

***4. The deviation will not alter the findings made when the original permit or variance was approved.***

a. Findings 2 -14 contain findings for CEQA compliance associated with the EIR. Approval of the Minor Deviation requested does not change any of those findings. Evidence e) iv. from Finding 14 states: *"Yellowtail kingfish require three times the water use of Atlantic salmon, have a higher marine protein content in their feed, and would have a higher energy use as a result of needing cooler water."*.
This finding is based on production of 25,000-27,000 metric tons of Yellowtail kingfish annually. With the requested Minor Deviation, in comparison, the project will produce 15,000 metric tons of Yellowtail kingfish at full buildout, which will require approximately 13,000 metric tons less feed each year and will reduce freshwater and energy uses. Even with the larger-scale production of Yellowtail kingfish analyzed in the EIR, the EIR concluded that the impacts would be less than significant. Because the Minor Deviation will reduce production, water, and energy uses, the changes to the project will reduce potential impacts even further. Impacts will therefore continue to be less than significant. This finding is not changed by the minor deviation.

b. Findings 15-33 include the required findings for approval of the Coastal Development Permit and Special Permit. Approval of this minor deviation will not alter any findings made when the original permit (PLN-2020-16698) was approved.

c. The proposed changes all involve reductions in area, consumption, effluent and production and no changes are made which will reduce measures to protect the community or environment.

***5. The deviation conforms with section 312-11.1.1 of the Humboldt County Code which defines a minor deviation in the case of development permits as, "An increase or decrease of less than 10 percent of the gross area of any yard, open space, working area or parking area; OR An increase or decrease of less than 10 percent of the size of any building or structure, or the total land area covered by any building or structure;"***

The proposed deviation reduces the building footprint by 9.8%. The previous combined building footprint was 766,530 square feet (SF). The building footprint following the Minor Deviation will be ~691,530, for a net change of -75,000 SF.

**Project Description**

The project description for the Coastal Development Permit and the Special Permit is as follows:

A Coastal Development Permit and Special Permit for demolition and remediation of the Samoa Pulp Mill facility and construction of a land-based finfish recirculating aquaculture system (RAS) facility. This includes development of five buildings totaling **691,530**square feet and installation of an approximately 4.8 megawatt (MW) solar array mounted on building rooftops, covering approximately 657,000 square feet **which may be reduced by up to 10% in area**. A Special Permit is required pursuant to HCC Section 313-109.1.5.2 for an exception to the loading space requirements. The height of the tallest proposed building is 60 feet. The project will be constructed in three phases: Phase 0 will involve demolition and site preparation. Phase 1 will include intake and outfall connections, hatchery building. Phase 1 grow-out modules, fish processing and administration building, central utility plant, Intake water treatment, wastewater treatment building, backup systems plant, oxygen generation plant, and utility and infrastructure installation and Phase 2 will consist of Phase 2 grow-out module construction. The aquaculture facility would produce fresh head on gutted fish and fillets for delivery to regional markets. The species produced at the facility is intended to be **Yellowtail kingfish (Seriola lalandi) and has been approved by** CDFW through their aquaculture registration process. The Project will include ancillary support features including paved parking, fire access roads, security fencing, and stormwater management features. The Project would require approximately **0.3** million gallons per day (MGD) of freshwater provided by the Humboldt Bay Municipal Water District, sourced from the Mad River. Existing on-site water service supplied by the Humboldt Bay Municipal Water District would be connected to the new buildings for potable use, fire sprinklers, and irrigation. The Project would require approximately 10 MGD of salt water, which will be provided by upgraded water intake infrastructure located adjacent to the NAFC Project Site, on Humboldt Bay. Treated wastewater would be discharged utilizing the existing Redwood Marine Terminal II ocean outfall pipe, which extends one and a half miles offshore. A total of **10.3** MGD would be released daily.

**Determination**

It is the determination of the Planning Division that:

☒ The Minor Deviation to the plot plan is approved subject to the terms and conditions of the original permit approval.

☐ The Minor Deviation to the plot plan is denied. The reasons for this denial are set forth in the analysis above.

Issued by: _____
John H. Ford
Director, Planning and Building Department

Date: 10/19/2023

Nordic Aquafarms California



Date: May 12, 2023
To: John Ford, Director of Planning and Building, Humboldt County, CA
From: Nordic Aquafarms California
Memo Re: Request for changes to the proposed Nordic Aquafarms Project

Nordic Aquafarms is requesting changes to the Samoa project located at 364 Vance Avenue in Samoa, California. The request is to change species to Yellowtail Kingfish and reduce the overall anticipated production volume. As such we expect many previously disclosed metrics to change relative to the construction and operation of the proposed project. Below is a summary of pertinent changes:

- Change of fish species from Atlantic salmon (Salmo salar) to Yellowtail Kingfish (Seriola lalandi).
- Construction of a smaller facility, a minimum of ~75,000 SF building footprint reduction.
- Reduced truck traffic due to reduced material goods during operation, and reduced construction intensity.
- Cooler effluent: Under Atlantic salmon the facility would have discharged 21°C effluent 365 days per year. Any heat that could not be dissipated into the effluent would have been directed to air to water chillers. Our Yellowtail Kingfish farm effluent temperature could peak as high as 20°C for several days under the warmest of seawater and air temperatures. After modeling seasonal fluctuations in receiving waters, we anticipate the effluent will peak no higher than 4°C above ambient ocean temperature. With this change in species, the farm will no longer require air to water chillers.
- Reduced energy needs: An estimated total reduction at full build out of ~70 GWh per year, or a~36% reduction.
- Increased salinity of effluent from 26.8 to ~31 PSU. Approximately 4 PSU closer to the salinity of the receiving water body.
- Reduced effluent volume from 12.5 Million Gallons per Day to 10.3 MGD. A 2.2 MGD reduction.
- Reduced GHG emissions (direct and indirect).

Also attached to this memo are the following:

- Overview of changes to Summary Chapter 1
- Overview of changes to Project Description Chapter 2
- Overview of changes to building footprint
- Overview of changes to the Alternatives Analysis

We appreciate your acceptance of this information on change in species and are available for any further questions you may have.

Respectfully,

Brenda Chandler (May 12, 2023 14:18 EDT)
Brenda L. Chandler
U.S. CEO

# Overview of changes to Summary Chapter 1

Table 1-2 of the EIR identifies, by resource category, the significant Project impacts, proposed mitigation measures, and post-mitigation significance. Additional information about the impacts and mitigation measures can be found in Chapter 3 of this Draft EIR, as referenced for each resource category.

Below is an adapted version of Table 1-2 which has been re-labeled as Table 1-2a. This is intended to be informational and does not constitute new investigative studies. Table 1-2a was assembled to demonstrate that the changes in fish species and the reduced farm scale proposed would result in either equivalent or reduced level of impact as analyzed in the EIR.

A column has been added to the right side of Table 1-2a indicating the relative impact of the proposed changes (species change and farm scale). The majority of the impacts remain the same with a handful of impacts listed under Project Significance being overly conservative for the proposed changes because that specific activity level regarding the impact area has been reduced.

| Impact | Project Component | Project Significance | Mitigation Measure | After Mitigation Significance | Yellowtail Kingfish Impact vs Atlantic Salmon |
|---|---|---|---|---|---|
| **Aesthetics** | | | | | |
| **AES-1** Would the Project have a substantial adverse effect on a scenic vista? | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **AES-2** Would the Project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? | Terrestrial Development | No Impact | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | No Impact | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **AES-3** In a non-urbanized area, would the Project substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from a publicly accessible vantage point). | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **AES-4** Would the Project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | No Impact | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **AES-C-1** Would the Project contribute to a cumulatively significant impact to visual resources? | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | Less than Significant | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **Air Quality** | | | | | |
| **AQ-1** Would the Project conflict with or obstruct implementation of the applicable air quality plan? | Terrestrial Development | Less than Significant with Mitigation | Mitigation Measure AQ-1 Best Management Practices to Reduce Air Pollution | Less than Significant | Reduced construction activity |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant with Mitigation | Mitigation Measure AQ-1 Best Management Practices to | Less than Significant | Same |

| Impact | Project Component | Project Significance | Mitigation Measure | After Mitigation Significance | Yellowtail Kingfish Impact vs Atlantic Salmon |
|---|---|---|---|---|---|
| | | | Reduce Air Pollution | | |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **AQ-2** Would the Project result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard? | Terrestrial Development | Less than Significant with Mitigation | Mitigation Measure AQ-1 Best Management Practices to Reduce Air Pollution | Less than Significant | Reduced construction activity |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant with Mitigation | Mitigation Measure AQ-1 Best Management Practices to Reduce Air Pollution | Less than Significant | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **AQ-3** Would the Project expose sensitive receptors to substantial pollutant concentrations? | Terrestrial Development | Less than Significant with Mitigation | Mitigation Measure AQ-1 Best Management Practices to Reduce Air Pollution | Less than Significant | Reduced Construction activity |
| | Ocean Discharge | No Impact | N/A | N/A | N/A |
| | Humboldt Bay Water Intakes | Less than Significant with Mitigation | Mitigation Measure AQ-1 Best Management Practices to Reduce Air Pollution | Less than Significant | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **AQ-4** Would the Project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people? | Terrestrial Development | Less than Significant with Mitigation | Mitigation Measure AQ-2-Best Management Practices to Reduce Asbestos Emissions During Demolition | Less than Significant | Reduced operational activity |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **AQ-C-1** Would the Project contribute to a cumulatively significant impact to air quality? | Terrestrial Development | Less than Significant with Mitigation | Mitigation Measure AQ-1 Best Management Practices to Reduce Air | Less than Significant | Reduced Construction and Operational activity |

| Impact | Project Component | Project Significance | Mitigation Measure | After Mitigation Significance | Yellowtail Kingfish Impact vs Atlantic Salmon |
|---|---|---|---|---|---|
| | | | Pollution Mitigation Measure AQ-2- Best Management Practices to Reduce Asbestos Emissions During Demolition | | |
| | Ocean Discharge | Less than Significant with Mitigation | Mitigation AQ-1 Best Management Practices to Reduce Air Pollution Mitigation Measure AQ-2 Best Management Practices to Reduce Asbestos Emissions During Demolition | Less than Significant | Same |
| | Humboldt Bay Water Intakes | Less than Significant with Mitigation | Mitigation AQ-1 Best Management Practices to Reduce Air Pollution Mitigation Measure AQ-2 Best Management Practices to Reduce Asbestos Emissions During Demolition | Less than Significant | Same |
| | Compensatory Off-Site Restoration | Less than Significant with Mitigation | Mitigation AQ-1 Best Management Practices to Reduce Air Pollution Mitigation Measure AQ-2 Best Management Practices to Reduce Asbestos Emissions During Demolition | Less than Significant | Same |
| **Biological Resources** | | | | | |
| **BIO-1** Would the Project have a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW, USFWS or NMFS? | Terrestrial Development | Less than Significant with Mitigation | Mitigation Measure BIO-1 Implementation of Compensatory Mitigation for Loss of Dark-eyed Gilia<br>Mitigation Measure BIO-2 Protect Special Status Terrestrial Mammals<br>Mitigation Measure BIO-3 Protect Special Status Bats | Less than Significant | Reduced footprint, construction and operational activity |

| Impact | Project Component | Project Significance | Mitigation Measure | After Mitigation Significance | Yellowtail Kingfish Impact vs Atlantic Salmon |
|---|---|---|---|---|---|
| | | | Mitigation Measure BIO-4 Protect Special Status Amphibians<br>Mitigation Measure BIO-5a Protection of Osprey<br>Mitigation Measure BIO-5 Protect Special Status, Migratory, and Nesting BirdsMitigation Measure BIO-6 Limits on Soil Densification Construction to Avoid Impacts to Marine Mammals<br>Mitigation Measure HWQ-1 Implement Stormwater Pollution Prevention Plan (SWPPP)<br>Mitigation Measure GEO-2 Construction Best Management Practices. | | |
| | Ocean Discharge | Less than Significant | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant with Mitigation | Mitigation Measure BIO-2 Protect Special Status Terrestrial Mammals<br>Mitigation Measure BIO-4 Protect Special Status Amphibians<br>Mitigation Measure BIO-5 Protect Special Status, Migratory, and Nesting Birds<br>Mitigation Measure BIO-6a<br>Protection of Longfin Smelt | Less than Significant | Same |
| | Compensatory Off-Site Restoration | Less than Significant with Mitigation | Mitigation Measure PEIR BIO-3 Minimize Impacts to Special Status Plant Species | Less than Significant | Same |

| Impact | Project Component | Project Significance | Mitigation Measure | After Mitigation Significance | Yellowtail Kingfish Impact vs Atlantic Salmon |
|---|---|---|---|---|---|
| | | | Mitigation Measure BIO-4 Protect Special Status Amphibians<br>Mitigation Measure BIO-5 Protect Special Status, Migratory, and Nesting Birds<br>Mitigation Measure BIO-5a Protection of Osprey<br>Mitigation Measure Spartina PEIR BIO-2 Minimize Noise Effects<br>Mitigation Measure Spartina PEIR BIO-3 Avoid Northern Harrier and Short-Eared Owl Nests<br>Mitigation Measure Spartina PEIR BIO-6: Reduce Noise near Marine Mammals<br>Mitigation Measure HWQ-3 Protection of Water Quality During Pile Removal<br>Mitigation Measure Spartina PEIR WQ-3 Minimize Fuel and Petroleum Spill Risks<br>Mitigation Measure Spartina PEIR WQ-6 Designate Ingress/Egress Routes<br>Mitigation Measures Spartina PEIR WQ-7 Removal of Wrack<br>Mitigation Measure Spartina PEIR HHM-2 Accidents Associated with Release of Chemicals and Motor Fuel<br>Mitigation Measure Spartina PEIR BIO-1 Minimize Effects of Mechanical | | |

| Impact | Project Component | Project Significance | Mitigation Measure | After Mitigation Significance | Yellowtail Kingfish Impact vs Atlantic Salmon |
|---|---|---|---|---|---|
| | | | Spartina Removal Methods to Special Status Fish Species | | |
| **BIO-2** Would the Project have a substantial adverse effect on any riparian habitat or other Sensitive Natural Community identified in local or regional plans, policies, regulations or by the CDFW or USFWS? | Terrestrial Development | Less than Significant with Mitigation | Mitigation Measure BIO-7a Implement Compensatory Mitigation for Sensitive Natural Communities<br>Mitigation Measure BIO-7b Construction Protocol for Protection of ESHA | Less than Significant | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant with Mitigation | Mitigation Measure Spartina PEIR BIO-5 Avoid Impacts to Eelgrass | Less than Significant | Same |
| **BIO-3** Would the Project have a substantial adverse effect on state or federally protected wetlands (including but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? | Terrestrial Development | Less than Significant with Mitigation | Mitigation Measure GEO-2 Construction Best Management Practices | Less than Significant | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | No Impact | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **BIO-4** Would the Project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? | Terrestrial Development | No Impact | N/A | N/A | Same |
| | Ocean Discharge | Less than Significant | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant with Mitigation | Mitigation Measure HWQ-3 Protection of Water Quality During Pile Removal<br>Mitigation Measure Spartina PEIR WQ-3 Minimize Fuel and Petroleum Spill Risks<br>Mitigation Measure Spartina PEIR WQ-6: Designate | Less than Significant | Same |

| Impact | Project Component | Project Significance | Mitigation Measure | After Mitigation Significance | Yellowtail Kingfish Impact vs Atlantic Salmon |
|---|---|---|---|---|---|
| | | | Ingress/Egress Routes<br>Mitigation Measures Spartina PEIR WQ-7 Removal of Wrack<br>Mitigation Measure Spartina PEIR HHM-2 Accidents Associated with Release of Chemicals and Motor Fuel<br>Mitigation Measure Spartina PEIR BIO-1 Minimize Effects of Mechanical Spartina Removal Methods to Special Status Fish Species | | |
| **BIO-5** Would the Project conflict with any local policies or ordinances protecting biological resources such as a tree preservation policy or ordinance? | Terrestrial Development | No Impact | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **BIO-6** Would the Project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? | Terrestrial Development | No Impact | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | No Impact | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **BIO-C-1**: Would the Project contribute to a cumulatively significant impact to biological resources? | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | Less than Significant | N/A | N/A | Reduced effluent Volume, Temperature, Increased salinity |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **Cultural Resources** | | | | | |
| **CR-1** | Terrestrial Development | No Impact | N/A | N/A | Same |

| Impact | Project Component | Project Significance | Mitigation Measure | After Mitigation Significance | Yellowtail Kingfish Impact vs Atlantic Salmon |
|---|---|---|---|---|---|
| Would the Project cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5? | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | No Impact | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **CR-1** Would the Project cause a substantial adverse change in the significance of a historical or archaeological resource pursuant to Section 15064.5? | Terrestrial Development | Less than Significant with Mitigation | Mitigation Measure CR-1- Implementation of Protocols for Cultural Monitoring During Ground Disturbance<br>Mitigation Measure CR-2 Implementation of Inadvertent Discovery Protocols | Less than Significant | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant with Mitigation | Mitigation Measure CR-1- Implementation of Protocols for Cultural Monitoring During Ground Disturbance<br>Mitigation Measure CR-2- Implementation of Inadvertent Discovery Protocols | Less than Significant | Same |
| | Compensatory Off-Site Restoration | Less than Significant with Mitigation | Mitigation Measure CR-2- Implementation of Inadvertent Discovery Protocols | Less than Significant | Same |
| **CR-2** Would the Project disturb any human remains, including those interred outside of formal cemeteries? | Terrestrial Development | Less than Significant with Mitigation | Mitigation Measure CR-3-Minimize Impacts to Unknown Archaeological Resources or Human Remains if Encountered | Less than Significant | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant with Mitigation | Mitigation Measure CR-3-Minimize Impacts to Unknown Archaeological Resources or | Less than Significant | Same |

| Impact | Project Component | Project Significance | Mitigation Measure | After Mitigation Significance | Yellowtail Kingfish Impact vs Atlantic Salmon |
|---|---|---|---|---|---|
| | | | Human Remains if Encountered | | |
| | Compensatory Off-Site Restoration | Less than Significant with Mitigation | Mitigation Measure CR-3-Minimize Impacts to Unknown Archaeological Resources or Human Remains if Encountered | Less than Significant | Same |
| **CR-C-1** Would the Project contribute to a cumulatively significant impact to cultural resources? | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | Less than Significant | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **Energy** | | | | | |
| **ENG-1** Would the Project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation? | Terrestrial Development | Less than Significant | N/A | N/A | Reduced energy needs |
| | Ocean Discharge | Less than Significant | N/A | N/A | Reduced energy needs |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **ENG-2** Would the Project conflict with or obstruct a state or local plan for renewable energy or energy efficiency? | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | Less than Significant | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **ENG-C-1** Would the Project contribute to a cumulatively significant impact to energy resources? | Terrestrial Development | Less than Significant | N/A | N/A | Reduced energy needs |
| | Ocean Discharge | Less than Significant | N/A | N/A | Reduced energy needs |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **Geology and Soils** | | | | | |

| Impact | Project Component | Project Significance | Mitigation Measure | After Mitigation Significance | Yellowtail Kingfish Impact vs Atlantic Salmon |
|---|---|---|---|---|---|
| **GEO-1** Would the Project directly or indirectly cause potential substantial adverse effects involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? | Terrestrial Development | No Impact | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | No Impact | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **GEO-2** Would the Project directly or indirectly cause strong seismic ground shaking? | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | Less than Significant | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **GEO-3** Would the Project directly or indirectly cause seismic-related ground failure, including liquefaction, landslides, or otherwise unstable soils? | Terrestrial Development | Less than Significant with Mitigation | Mitigation Measure GEO-1-Implement Geotechnical Recommendations | Less than Significant | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **GEO-4** Would the Project result in substantial soil erosion or loss of topsoil? | Terrestrial Development | Less than Significant with Mitigation | Mitigation Measure GEO-2-Construction Best Management Practices<br>Mitigation Measure HWQ-1- Implement Stormwater Pollution Prevention Plan (SWPPP) | Less than Significant | Reduced Construction Activities |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant with Mitigation | Mitigation Measure GEO-2-Construction Best Management Practices<br>Mitigation Measure HWQ-1- Implement Stormwater Pollution | Less than Significant | Same |

| Impact | Project Component | Project Significance | Mitigation Measure | After Mitigation Significance | Yellowtail Kingfish Impact vs Atlantic Salmon |
|---|---|---|---|---|---|
| | | | Prevention Plan (SWPPP) | | |
| | Compensatory Off-Site Restoration | Less than Significant with Mitigation | Mitigation Measure Spartina PEIR GS-1/WQ-5: Erosion Control | Less than Significant | Same |
| **GEO-5** Would the Project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater? | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | No Impact | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **GEO-6** Would the Project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? | Terrestrial Development | Less than Significant with Mitigation | Mitigation Measure GEO-3-Inadvertent Discovery of Paleontological Resources | Less than Significant | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | No Impact | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **GEO-C-1** Would the Project contribute to a cumulatively significant impact to geology and soils? | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | Less than Significant | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **Greenhouse Gas Emissions** | | | | | |
| **GHG-1** Would the Project generate greenhouse gas (GHG) emissions, either directly or indirectly, that may have a significant impact on the environment? | Terrestrial Development | Less than Significant | N/A | N/A | Reduced need for Energy, goods and Truck trips |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **GHG-2** Would the Project conflict with an applicable plan, policy, or regulation adopted for the | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |

| Impact | Project Component | Project Significance | Mitigation Measure | After Mitigation Significance | Yellowtail Kingfish Impact vs Atlantic Salmon |
|---|---|---|---|---|---|
| purpose of reducing the emissions of GHGs? | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **GHG-C-1** Would the Project contribute to a cumulatively significant impact relative to GHG emissions? | Terrestrial Development | Less than Significant | N/A | N/A | Reduced need for energy, goods Truck trips |
| | Ocean Discharge | Less than Significant | N/A | N/A | Reduced need for Energy |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **Hazards and Hazardous Materials** | | | | | |
| **HAZ-1** Would the Project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? | Terrestrial Development | Less than Significant | N/A | N/A | Reduced production Of waste materials |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **HAZ-2** Would the Project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? | Terrestrial Development | Less than Significant with Mitigation | Mitigation Measure HAZ-1-Implement Recommendations of Interim Measures Work Plan<br>Mitigation Measure AIR-2-Best Management Practices to Reduce Asbestos Emissions During Demolition<br>Mitigation Measure GEO-2-Construction Best Management Practices<br>Mitigation Measure HWQ-1-Implement Stormwater Pollution Prevention Plan (SWPPP) | Less than Significant | Reduced production Of waste materials, Reduced use of Chemicals for water treatment |
| | Ocean Discharge | Less than Significant | N/A | N/A | Reduced effluent Volume |
| | Humboldt Bay Water Intakes | Less than Significant with Mitigation | Mitigation Measure HAZ-1-Implement Recommendations of Interim | Less than Significant | Same |

| Impact | Project Component | Project Significance | Mitigation Measure | After Mitigation Significance | Yellowtail Kingfish Impact vs Atlantic Salmon |
|---|---|---|---|---|---|
| | | | Measures Work Plan<br>Mitigation Measure AIR-2-Best Management Practices to Reduce Asbestos Emissions During Demolition<br>Mitigation Measure GEO-2-Construction Best Management Practices<br>Mitigation Measure HWQ-1-Implement Stormwater Pollution Prevention Plan (SWPPP) | | |
| | Compensatory Off-Site Restoration | Less than Significant with Mitigation | Mitigation Measure HWQ-1-Implement Stormwater Pollution Prevention Plan (SWPPP)<br>Mitigation Measure HWQ-3-Protection of Water Quality During Pile Removal<br>Mitigation Measure Spartina PEIR WQ-3-Minimize Fuel and Petroleum Spill Risks<br>Mitigation Measure Spartina PEIR HHM-2-Accidents Associated with Release of Chemicals and Motor Fuel. | Less than Significant | Same |
| **HAZ-3**<br>Would the Project emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? | Terrestrial Development | No Impact | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | No Impact | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **HAZ-4**<br>Would the Project be located on a site that is included on a list of hazardous materials sites | Terrestrial Development | Less than Significant with Mitigation | Mitigation Measure HAZ-1-Implement Recommendations of Interim | Less than Significant | Same |

| Impact | Project Component | Project Significance | Mitigation Measure | After Mitigation Significance | Yellowtail Kingfish Impact vs Atlantic Salmon |
|---|---|---|---|---|---|
| compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment (State CEQA Guidelines Section 15186)? | | | Measures Work Plan | | |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **HAZ-5** Would the Project be located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, result in a safety hazard or excessive noise for the people residing or working in the area? | Terrestrial Development | No Impact | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | No Impact | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **HAZ-6** Would the Project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? | Terrestrial Development | No Impact | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | No Impact | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **HAZ-3** Would the Project expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands? | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | No Impact | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **HAZ-C-1** Would the Project result in a cumulatively significant impact from increased exposure of the public or environment to hazards or hazardous substances? | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | Less than Significant | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **Hydrology and Water Quality** | | | | | |
| **HWQ-1** Would the Project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality? | Terrestrial Development | Less than Significant with Mitigation | Mitigation Measure HWQ-1-Implement Stormwater Pollution Prevention Plan (SWPPP) Mitigation Measure GEO-2- | Less than Significant | Same |

| Impact | Project Component | Project Significance | Mitigation Measure | After Mitigation Significance | Yellowtail Kingfish Impact vs Atlantic Salmon |
|---|---|---|---|---|---|
| | | | Construction Best Management Practices | | |
| | Ocean Discharge | Less than Significant | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant with Mitigation | Mitigation Measure HWQ-1-Implement Stormwater Pollution Prevention Plan (SWPPP) | Less than Significant | Same |
| | Compensatory Off-Site Restoration | Less than Significant with Mitigation | Mitigation Measure HWQ-3-Protection of Water Quality During Pile Removal Mitigation Measure Spartina PEIR WQ-3-Minimize Fuel and Petroleum Spill Risks<br>Mitigation Measure Spartina PEIR WQ-6-Designate Ingress/Egress Routes<br>Mitigation Measures Spartina PEIR WQ-7-Removal of Wrack<br>Mitigation Measure Spartina PEIR HHM-2-Accidents Associated with Release of Chemicals and Motor Fuel | Less than Significant | Same |
| **HWQ-2**<br>Would the Project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin? | Terrestrial Development | No Impact | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | No Impact | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **HWQ-3**<br>Would the Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces in a manner which would result in substantial | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |

| Impact | Project Component | Project Significance | Mitigation Measure | After Mitigation Significance | Yellowtail Kingfish Impact vs Atlantic Salmon |
|---|---|---|---|---|---|
| erosion or siltation on- or off-site? | | | | | |
| **HWQ-4** Would the Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site? | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **HWQ-5** Would the Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff? | Terrestrial Development | Less than Significant with Mitigation | Mitigation Measure HAZ-1-Implement Recommendations of Interim Measures Work Plan | Less than Significant | Same |
| | Ocean Discharge | Less than Significant | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **HWQ-6** Would the Project impede or redirect flood flows? | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | No Impact | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **HWQ-7** Would the Project cause an increase in flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation? | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | Less than Significant | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **HWQ-8** Would the Project conflict with or obstruct implementation of a water quality control plan or | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |

| Impact | Project Component | Project Significance | Mitigation Measure | After Mitigation Significance | Yellowtail Kingfish Impact vs Atlantic Salmon |
|---|---|---|---|---|---|
| sustainable groundwater management plan? | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **HWQ-C1** Would the Project contribute to a cumulatively significant impact to hydrology and water quality? | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | Less than Significant | N/A | N/A | Reduced effluent Volume, temperature Increased salinity |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **Noise** | | | | | |
| **NOI-1** Would the Project result in generation of a substantial temporary or permanent increase in ambient noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? | Terrestrial Development | Less than Significant | N/A | N/A | Reduced Construction activity |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **NOI-2** Would the Project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels? | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **NOI 3** Would the Project be located within the vicinity of a private airstrip or an airport land use plan, or where such a plan has not been adopted, within two miles of a public airport or public use airport, exposing people residing or working in the Project Area to excessive noise levels? | Terrestrial Development | No Impact | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | No Impact | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **NOI-C-1** Would the Project contribute to a cumulatively significant impact from noise? | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | Less than Significant | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **Population and Housing** | | | | | |

| Impact | Project Component | Project Significance | Mitigation Measure | After Mitigation Significance | Yellowtail Kingfish Impact vs Atlantic Salmon |
|---|---|---|---|---|---|
| **POP-1** Would the Project induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | No Impact | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **POP-2** Would the Project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere? | Terrestrial Development | No Impact | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | No Impact | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **POP-C-1** Would the Project contribute to a cumulatively significant impact to Population and Housing? | Terrestrial Development | No Impact | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | No Impact | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **Transportation** | | | | | |
| **TR-1** Would the Project conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities? | Terrestrial Development | Less than Significant | N/A | N/A | Reduced truck trips |
| | Ocean Discharge | Less than Significant | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **TR-2** Would the Project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)? | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | Less than Significant | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **TR-3** Would the Project substantially increase hazards due to geometric design feature (e.g., sharp curves or dangerous | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | Less than Significant | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |

| Impact | Project Component | Project Significance | Mitigation Measure | After Mitigation Significance | Yellowtail Kingfish Impact vs Atlantic Salmon |
|---|---|---|---|---|---|
| intersections) or incompatible uses (e.g., faming equipment)? | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **TR-4** Would the Project result in inadequate emergency access? | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | Less than Significant | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **TR-C-1** Would the Project contribute to cumulatively significant impact related to transportation? | Terrestrial Development | Less than Significant | N/A | N/A | Reduced truck trips |
| | Ocean Discharge | Less than Significant | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **Utilities and Service Systems** | | | | | |
| **UTL-1** Would the Project require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electrical power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects? | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **UTL-2** Would the Project have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years? | Terrestrial Development | Less than Significant | N/A | N/A | Reduced freshwater needs |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | No Impact | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **UTL-3** Would the Project result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments? | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | No Impact | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **UTL-4** | Terrestrial Development | Less than Significant | N/A | N/A | Reduced waste Material production |

| Impact | Project Component | Project Significance | Mitigation Measure | After Mitigation Significance | Yellowtail Kingfish Impact vs Atlantic Salmon |
|---|---|---|---|---|---|
| Would the Project generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals? | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **UTL-5** Would the Project comply with federal, state, and local management and reduction statutes and regulation related to solid waste? | Terrestrial Development | No Impact | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | No Impact | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **UTL-C-1** Would the Project contribute to a cumulatively significant impact to utilities and service systems? | Terrestrial Development | Less than Significant | N/A | N/A | Reduced energy And freshwater needs |
| | Ocean Discharge | Less than Significant | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |
| **Wildfire** | | | | | |
| **WF-1** Would the Project substantially impair an adopted emergency response plan or emergency evacuation plan? | Terrestrial Development | No Impact | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | No Impact | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **WF-2** Would the Project due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose Project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire? | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **WF-3** Would the Project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or | Terrestrial Development | No Impact | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |

| Impact | Project Component | Project Significance | Mitigation Measure | After Mitigation Significance | Yellowtail Kingfish Impact vs Atlantic Salmon |
|---|---|---|---|---|---|
| ongoing impacts to the environment? | | | | | |
| **WF-4** Would the Project expose people or structures to significant risks, including downslope or downstream flooding or landslides as a result of runoff, post-fire slope instability, or drainage changes? | Terrestrial Development | No Impact | N/A | N/A | Same |
| | Ocean Discharge | No Impact | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | No Impact | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | No Impact | N/A | N/A | Same |
| **WF-C-1** Would the Project contribute to a cumulatively significant impact related to wildfire risk? | Terrestrial Development | Less than Significant | N/A | N/A | Same |
| | Ocean Discharge | Less than Significant | N/A | N/A | Same |
| | Humboldt Bay Water Intakes | Less than Significant | N/A | N/A | Same |
| | Compensatory Off-Site Restoration | Less than Significant | N/A | N/A | Same |

# Overview of changes to Project Description Chapter 2

Chapter 2 of the EIR, the Project Description, provides information and supporting figures for the proposed Samoa Peninsula Land-based Aquaculture facility.

Below is a summary table of the requested changes to the project description and the resulting change in project impact separated by document section. Additionally, there is a copy of Table 2-9 with additional information added showing the reduction in Daily Maximum Effluent Totals. The proposed changes to the Project Description result in either equivalent or reduced level of impact as analyzed in the EIR.

| Project Description Section | Section Title | Changes From EIR | Comments |
|---|---|---|---|
| 2.1 | Introduction | No Change | No Change |
| 2.1.1 | Project Definition | Smaller Building 1 footprint and corresponding reduction in rooftop solar. Reduction in maximum discharge volume to 10.3 MGD. Potential change in farm layout. | Less footprint = less impact. |
| 2.1.2 | Project Site Definition | Reduction in lease area to exclude the shops and stores and machine building. | No Change |
| 2.1.3 | Project Objectives | Potential reduction in jobs created at full build out. | This is TBD as we are adding hatchery and brood stock staff and processing may be the same |
| 2.1.4 | Project Background | No Change. | No Change |
| 2.1.5 | Project Setting | Egg importation permit changes to fish importation permit | No change in impact. It's a live animal importation permit regardless of egg of fish. |
| 2.1.6 | Overall Project Timeline | Postpone expected demolition and construction start dates to reflect current permitting timeline. | No change in impact. |
| 2.2 | Terrestrial Development | No Change | No Change |
| 2.2.1 | Existing Conditions | Addition of "Existing Offices" and Machine Building" to the infrastructure reuse list. No tenant relocation required. | Reduced impact. Reuse is preferred by CCC |
| 2.2.2 | Project Design | Reduction in total production capacity. Change to Yellowtail Kingfish. Change in species produced by Fredrikstad Seafoods to Yellowtail Kingfish. Addition of onsite brood stock and egg production. Heat generated in the facility is from the equipment and the biologic process. Project may include additional phases to reach full build out. Reduction in building size including building 1 footprint to exclude the existing office building including a corresponding decrease in rooftop solar. | Reduced impact. Less feed, transportation of goods and energy used |
| 2.2.3 | Project Construction | Construction phasing increasing. Construction timelines extending. Brood stock onsite as early as feasible during phase 1. | Less construction impact per year |
| 2.2.4 | Project Operations | Reduction in use of industrial freshwater. Potential to limit saltwater use in an emergency and substitute industrial fresh water is no longer an option. Smaller building footprint. Proposed function of buildings will be combined if number of buildings is reduced. Reduced parking appropriate to accommodate staff and visitors for each phase of the project. Reduced number of trucks for product, waste, fish feed, and process chemicals. Addition of brood stock area. Eggs will no longer be mono-sexted. Egg biosecurity and quarantine will be mirrored in the fry importation program. | Reduced impact to freshwater resources |
| 2.3 | Ocean Discharge | Reduction in maximum discharge volume. Additional phasing on diffuser port opening. | Reduced impact from effluent |
| 2.3.1 | Summary of NPDES Requirements | Reduction in use of industrial freshwater. | Reduced impact to freshwater resources |
| 2.3.2 | Additional Monitoring to be Completed by the Applicant | No Change | No Change |
| 2.4 | Humboldt Bay Water Intakes | No Change | No Change |
| 2.4.1 | Description | No Change | No Change |
| 2.4.2 | Existing Conditions | No Change | No Change |
| 2.4.3 | Trench Details | No Change | No Change |
| 2.4.4 | Intake Design Conditions | No Change | No Change |
| 2.4.5 | Project Construction | Change in construction start to reflect current permitting timeline. | No change in impact |
| 2.4.6 | Project Operations | No Change | No Change |
| 2.4.7 | Off-Site Compensatory Restoration | No Change | No Change |

*Table 2-9 Project Daily Maximum Effluent Summary*

| Effluent | Discharge Yellowtail Kingfish | Discharge Atlantic Salmon | Conversion to lbs/day | Percent Reduction |
|---|---|---|---|---|
| Total Water volume | 10.3 MGD | 12.5 MGD | - | -18% |
| Total Suspended Solids (TSS) | 153 KGD | 185 KGD | 408 | -17% |
| Biochemical Oxygen Demand (BOD) | 134 KGD | 162 KGD | 357 | -17% |
| Total Nitrogen (TN) | 555 KGD | 673 KGD | 1,484 | -18% |
| Ammonium Nitrogen (NH4) | 0.06 KGD | 0.07 KGD | 0.15 | -14% |
| Phosphorus (P) | 4.8 KGD | 5.8 KGD | 13 | -14% |

Notes:
MGD = Millions of Gallons per Day
KGD = Kilograms per day
Lbs/day = Pounds per day

# Overview of changes to building footprint

Below is a figure showing the requested change to the Project footprint reducing the footprint of the Project by ~75,000 sq. feet. The proposed changes to the Project footprint results in a reduced level of impact as analyzed in the EIR.

PLEASE NOTE! THE BLACK LINES ILLUSTRATE THE ORIGINAL SITE LAYOUT

GRID CONNECTION

OUTFALL PIPE

BUILDING 1, Reduced footprint
Length reduced by appr. 280 ft

WWTP (ACTIVATED SLUDGE)

SEA CHEST

Preliminary Design

All dimensions are in mm
Sharp edges and burrs to be removed
Tolerance DS 7764-m, if nothing else is stated



Nordic Aquafarms Technology
Skalmejvej 80, 9520 Lyshyg, Denmark

| | Date | Name | Drawing number |
|---|---|---|---|
| Drawn | 27-02-2023 | MkT | NAF ECU 02 - Site |
| Checked | | | Sheet: Sheet 1 of 1 |
| Approved | | | Revision: 1 |
| | | | Format: A1 |

REVISION HISTORY

| REV | SHEET | DESCRIPTION | DATE | BY | CHKD |
|---|---|---|---|---|---|
| 1 | ALL | 50 ft reference line added by east end of building 1 | 03-05-2023 | MKT | BC |

# Overview of changes to the Alternatives Analysis

Chapter 4 of the EIR, the Alternatives Analysis, provides information on alternatives for the proposed Samoa Peninsula Land-based Aquaculture facility.

Below is a summary of the requested changes and supporting information related to the alternatives analysis.

Nordic Aquafarms California

Date: May 12, 2023

To: John Ford, Director of Planning and Building, Humboldt County
Cassidy Teufel, EORFC Program Manager, California Coastal Commission
Holly Wyer, Senior Environmental Scientist, California Coastal Commission
Craig Shuman, Marine Region Manager, California Department of Fish and Wildlife
Randy Lovell, State Aquaculture Coordinator, California Department of Fish and Wildlife

From: Nordic Aquafarms California

Memo: ***Overview of changes to the Alternatives Analysis***

At the onset of the Nordic Aquafarms Project Draft Environmental Impact Report (DEIR) in 2020 to 2021, Nordic evaluated three fish as alternative species - Steelhead trout (marine), Rainbow trout (freshwater), and Yellowtail kingfish (marine). The analysis in Section 4.3.3, *Alternative 3: Fish Species and Water Source*, was conducted to assess the potential impacts from raising the alternative species at the proposed farm scale having an annual production capacity of approximately 25,000 - 27,000 metric tons of Head On Gutted (HOG) fish once full build out is completed. Since this was a biological, environmental, and cultural assessment, no alternative business case or economic evaluation was conducted during the alternative species analysis. The recent change in species production for Nordic Aquafarms California (NAFC) was the result of a business decision driven by several key factors that will be discussed in this memo.

The DEIR was written over two years ago in part using metrics from our commercial Yellowtail kingfish operations in Denmark. Since that time, new information pertaining to the land-based production of Yellowtail kingfish has become available from our farm and others along with key changes in market conditions. Now the business case for operating a smaller scale farm growing Yellowtail kingfish has been proven successful. Innovation and operation efficiency happening at all levels of our company will continue to drive improvement. Key factors leading to this success are as follows:

- Yellowtail kingfish grow to market size faster than Atlantic salmon.
- Improvement in FCR from 1.5 to 1.35 for Yellowtail kingfish. NAFC will now use an FCR of 1.35 for designing the farm.
- Reduced energy per kg required for Yellowtail kingfish relative to Atlantic salmon.
- The price point in the market for Yellowtail kingfish is more than double that for Atlantic salmon.

Nordic Aquafarms California (NAFC) recently announced a shift in species production at the Samoa, California facility from Atlantic salmon to Yellowtail kingfish (*Seriola lalandi*). In the announcement, NAFC further explained that the shift in species to Yellowtail kingfish will also enable the company to reduce the designed annual output of the farm. Now the company is planning to construct a facility with annual output of 3,000 metric tons as phase one, and over a longer period, will grow to an approximately 15,000 MT facility on the Samoa site. The nearly 50% reduction in scale of farm output considerably changes the context of statements made toward Yellowtail kingfish within the Alternative Species Analysis of the DEIR.

Below we have extracted the various statements regarding Yellowtail kingfish that were made in the Alternative Analysis section of the DEIR. We discuss how the reduction in farm size and new information obtained since the time of writing the DEIR addresses most of the concerns that were raised in the original evaluation.

1) *"Due to the higher FCR, Yellowtail Kingfish would require additional water treatment and water consumption."*

This statement still holds true on a per kg of fish produced basis just as it did when it was written, however, improvements in Food Conversion Ratio (FCR) for growing Yellowtail kingfish in land-based RAS systems have been made over recent years. At the time of writing the DEIR, only two land-based fish farms growing Yellowtail kingfish existed, one of which was Nordic Aquafarms facility in Denmark. Both were operating relatively early in the learning curve for optimizing production protocols. At that time, an FCR of 1.5 was characteristic of these operations and reflective of net pen farming of the species in south Australia. Given the ability to have complete control over environmental and husbandry practices within a land-based fish farm, converting learnings to improvements is accelerated. Within just a couple of years, the land-based farms now report FCRs of 1.35-1.4 and this will continue to improve with intelligent feeding systems, improved feed formulation, and improvements from breeding programs. While these values are still greater than those reported for Atlantic salmon, further improvement will come quickly, and it is likely that Yellowtail kingfish will achieve similar FCR levels as salmon within land-based systems over the next few years.

The comments regarding additional water treatment and consumption are directly related to FCR. On an 'apples-to-apples' basis comparing Yellowtail kingfish to Atlantic salmon production **at the same output**, it is true that greater water consumption and treatment would be required for Yellowtail kingfish. However, this is not the case with the change at NAFC. Because of the reduced farm scale, we anticipate that effluent volume will be reduced from 12.5 million gallons per day (MGD) to 10.3 MGD at the full farm buildout. A reduction of 2.2 MGD (-18%).

2) *"There is no market for egg sourcing, which would thus require a large brood stock operation in Humboldt County and import of viable brood stock, and thus an expanded project footprint."*

While it is true there is no third-party commercial supplier of Yellowtail kingfish eggs in the world, Nordic Aquafarms owns and operates a Yellowtail kingfish hatchery in Denmark named, Maximus A/S. This hatchery includes broodstock and supplies juvenile fish to our farms in Denmark and Norway. NAFC will not rely on this hatchery for regular supply eggs or juvenile fish to our farm in California. Instead, we aim to replicate Maximus's success and establish our own broodstock and hatchery at the site in Samoa. It is important to establish a broodstock that is specific to our site and create a reliable source of offspring for the farm. The sooner we can establish the broodstock program the quicker we can select for important traits that will continually improve the farming cycle and sustainability metrics. This program will start with an initial transfer of small fish from Denmark. With the reduction of the annual production volume, we can reprogram the internal layout of the facility to incorporate broodstock and still afford a sizeable reduction in farm footprint. We have identified an initial 75,000 SF footprint reduction for the farm.

3) *"Yellowtail Kingfish are less efficient (than Atlantic salmon) at converting feed and are still largely a wild fish with very low familial lines."*

This statement was true at the time the DEIR was written and may still be true today. We have already seen improvements in FCR for Yellowtail raised at land-based RAS farms as we have improved feeding practices and introduced our next generation of fish into production. As previously discussed, further improvements will come quickly. Breeding programs for Atlantic salmon are well established around the world with some being more than 10 generations old. Broodstock programs for Yellowtail kingfish are much earlier in development and are typically a mix of wild fish and first- or second-generation domestic fish. NAFC will establish a base population of broodstock with the correct genetic profile to create a multi-generational breeding program with objectives that will provide significant improvements in metrics like FCR.

4) *"The less efficient conversion of feed would result in a higher production of nutrients and feces. Given nutrient removal and feces removal is currently maximized, the volume of nutrients in the treated effluent discharge would increase."*

It is true that higher FCR leads to increased feed volume and waste byproducts. If NAFC were changing from Atlantic salmon to Yellowtail kingfish at the initially proposed output volume, then the total feed volume for the farm would increase. For example, at the originally proposed 30,000 MT of production output a 1.1 FCR for Atlantic salmon would result in 33,000MT of feed while feed volume for Yellowtail kingfish for the same output would be 40,500 MT based on an FCR of 1.35. However, the proposed Yellowtail kingfish farm is expected to reach only half the annual output of the originally proposed farm. At 15,000 MT of output and an FCR of 1.35, the Yellowtail kingfish farm would require 20,250MT of feed at full build out. Therefore, a 39% reduction in feed volume will be realized with the proposed changes. The reduction in feed volume will be directly proportional to the reduction in the nutrients and feces. For context, the Alternative Analysis made a 1:1 comparison between Atlantic salmon and Yellowtail kingfish. The increased volume of feed from 25,000-27,000 MT of Yellowtail kingfish (H.O.G) would have required an expansion of the wastewater treatment facility or an increase in nutrient discharge levels.

5) *"Much higher water uses per pound of fish produced. Up to 50% higher FCR with higher marine protein content in feed."*

Due to the higher FCR and protein content in feed for yellowtail, water use per pound of fish is greater relative to Atlantic salmon. However, with a reduced farm scale the water consumption at full build out will decrease by -2.2MGD (-18%). As previously mentioned, the total feed volume for the farm is likely to be reduced by 35-40%.

Knowledge about the specific nutritional requirements for Atlantic salmon has been studied for decades. Because of this, feed companies know very well how to achieve versatile formulations for Atlantic salmon that can incorporate a broad range of ingredients including those that can substitute for marine ingredients. Progress toward marine ingredients reduction has been made with Yellowtail kingfish and

will improve over time, but it is not yet at the reduction level as seen with Atlantic salmon (<15%). We are already seeing promising results coming from HSWRI for replacing fish oil with algal oil in diets of Yellowtail. There is a good opportunity for further collaborations with local institutions to continue to make progress on driving down marine ingredients in Yellowtail diets.

NAFC has previously outlined feed standards on page 2-37 of the DEIR. Nothing has changed in this guidance with a shift to Yellowtail, and with regards to marine ingredients NAFC still aims to integrate viable alternatives to marine proteins, utilize byproduct trimmings, and require that our feed supplier source raw materials from fisheries certified by Marine Stewardship Council (MSC), International Federation of Fish Meal and Fish Oil (IFFO) and/or the Fisheries Improvement Project (FIP). It should also be noted that the Aquaculture Stewardship Council (ASC), as with Atlantic salmon, has a certification program for *Seriola* farms. This certification sets standards for environmental, social, and fish health and welfare metrics for today, but also requires that farms demonstrate progress on standards that will improve in time as the science rolls out from research and development programs.

6) *"Effluent would require either a large amount of water for cooling or much higher energy use to cool discharge water to comply with regulations."*

With a change from Atlantic salmon to Yellowtail kingfish comes a need to shift from water cooling to water heating. Salmon are raised at 12-14°C and Yellowtail kingfish are raised between 21-23°C. Without the use of heat exchangers on a Yellowtail kingfish farm, large amounts of cooling water from the bay would be required to lower the temperature of discharge, or chillers would need to be used for the same function. However, we have proven on a commercial scale that modern land-based RAS farms can extract heat from effluent water and use it to heat incoming water to the desired temperature. Based on empirical data collected after implementation of improved heat recovery technologies at our Danish Yellowtail kingfish facility, we are now in a position to properly re-assess the previous assumptions. Under Atlantic salmon the facility would have discharged a more constant temperature effluent at 21°C with no seasonal variation mostly due to the heat transfer from chillers away from the farm. Any additional heat loading that could not be dissipated into the effluent would have been directed to air to water chillers to remain within the NPDES permit. We will now retain heat on the farm. The effluent temperature from our Yellowtail kingfish farm will be more reflective of the seasonal variation in ambient temperature. While it could peak as high as 20°C for several days under the warmest of seawater and air temperatures, our modeling based on seasonal fluctuations predicts that effluent temperature will be no higher than 4°C above ambient ocean temperature. Previously, the temperature delta was higher for Atlantic salmon. Now the Yellowtail kingfish farm will have an annual average temperature of discharge that is closer to the receiving body and will be overall cooler than that of the previously described Atlantic salmon farm.

Nordic Aquafarms has operated two of the same RAS2020 production modules since 2018. One in Fredrikstad, Norway growing Atlantic salmon and the other in Hanstholm, Denmark growing Yellowtail kingfish. By comparing the operations, Nordic has learned that yellowtail kingfish production requires less kWh per kg of fish than Atlantic salmon. With the change in species, the farm will no longer require air to water chillers or pumping excess water for cooling which contributes greatly to the reduced energy requirements. Considering this, and the general operation of a smaller farm, we anticipate a total energy

reduction at full build of ~70GWh per year, or approximately a 36% reduction from the previously proposed Atlantic salmon farm.

7) *"CO2 impact: Would replace some international imports, but still has a higher CO2 footprint than salmon. Higher consumption of energy and water will impact CO2 footprint negatively."*

At the end of 2022, NAFC conducted a thorough investigation of the US market for farmed Yellowtail kingfish as we considered the shift in species in California. In this study, we found that Yellowtail kingfish is imported into the US from Japan, Australia, Denmark, and Netherlands. Imports from Japan alone accounts for approximately 55% of the estimated market in the US. Currently less than 1% of the US market for Yellowtail is supplied domestically.

As previously discussed, the Yellowtail kingfish farm will require less energy (-36%) and less water (-2.2MGD) relative to the Atlantic salmon farm previously proposed. These figures combined with the requirement for less feed and an overall reduced construction and operational intensity will certainly translate to a reduced (direct and indirect) GHG emissions and CO2 footprint.

8) *"Yellowtail Kingfish can survive in southern waters of the west coast, but domesticated fish seldom do. Possible breeding and predatory interaction with local marine fish species due to mixed sex stock. In the event of a hypothetical fish escape, either Rainbow Trout or Yellowtail Kingfish could result in a higher detrimental impact to the environment, compared to the proposed Atlantic Salmon, given they would have a higher potential to survive in the wild."*

Yellowtail kingfish, *Seriola lalandi*, is a fish native to Southern California. Since writing the DEIR, and prior to a formal decision to shift species from Atlantic salmon to Yellowtail kingfish, NAFC conducted a thorough assessment of risk to native species in California – a report that is currently being reviewed by CDFW. Given the measures that NAFC takes to prevent escape, it is highly unlikely that any yellowtail kingfish will leave the farm alive essentially eliminating the risk to native species. However, if a yellowtail kingfish from the NAFC's facility were to transfer into surrounding waters, they are unlikely to outcompete native fish for food or habitat given their domestic nature and the sub-optimal environment that Northern California presents for the species.

Hatchery raised yellowtail kingfish require three years before they are reproductively mature, however fish will be harvested by NAFC after no longer than 18months. This is well short of their ability to release gametes. If they were successful in surviving at least an additional 18 months in the natural environment, and the more than 700-mile distance to spawning grounds off Southern California, then it is conceivable they could breed. This is highly unlikely and given the abundance of wild yellowtail kingfish in California, the high fecundity of the species, the high natural mortality rate, and the broad range they disperse, any impact from interbreeding is likely to have no impact to native populations.

**ATTACHMENT 2**

**Estimates of Changes to the Predicted Zone of Water Quality Degradation**

**from the Updated Project Design**

**July 14, 2023**

# Report



**14 July 2023**

| | | | |
|---|---|---|---|
| **To** | David Noyes (Nordic) | **Contact No.** | +61 8 6222 8992 |
| **Copy to** | Misha Schwarz (GHD) | **Email** | jose.romero@ghd.com |
| **From** | Dr Jose Romero (GHD) | **Project No.** | 11205607 |
| **Project Name** | NORDIC AQUAFARMS CA-HUMBOLDT ENV | | |
| **Subject** | Estimates of Changes to the Predicted Zone of Water Quality Degradation from the Updated Project Design | | |

## 1. Introduction

This short report provides estimates of the spatial changes to the GHD (2021)[1] representative summer and winter predicted zones of water quality (WQ) degradation from the updated project design. Updates to the project design considered here include:

- A decrease in the aquaculture facility's discharge and nutrient loads.
- Use of the permit flows for the DG Fairhaven power plant and Samoa waste water treatment plant (WWTP).

Specifically, this short report addresses Item 3 (Addendum to Numeric Discharge Modelling Report) of the California Coastal Commission's letter (re: Coastal Development Permit Application No. 9-20-0488) dated 20 June 2023.

### 1.1 Limitations

*This report: has been prepared by GHD for Nordic Aquafarms and may only be used and relied on by Nordic Aquafarms for the purpose agreed between GHD and Nordic Aquafarms as set out in this report.*

*GHD otherwise disclaims responsibility to any person other than Nordic Aquafarms arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.*

*The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.*

*The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.*

*The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.*

[1] GHD (2021) Samoa Peninsula Land-Based Aquaculture Project: Numerical Modelling Report. Prepared for Nordic Aquafarms California LLC. July 2021. Rev2.

# 2. Discharge and $NO_X$ load from the Nordic facility

GHD (2021) demonstrated that the zone of potential WQ degradation was established by the oxidised inorganic nitrogen ($NO_X$) loads from the comingled discharge through the multi-port diffuser. The comingled discharge will be comprised of the inputs from the Nordic aquaculture facility, the DG Fairhaven power plant and the Samoa WWTP.

Table 1 shows that the discharge and $NO_X$ load of the updated (Yellowtail Kingfish) project will be 17.6% and 23.9% lower than the original (Atlantic Salmon) project, respectively. A small decrease in water temperature and increase in salinity are also projected from the facility. On the basis of the lower $NO_X$ load from the updated project, a decrease in the spatial extent of the zone of potential WQ degradation (GHD 2021) is expected relative to the original project.

*Table 1* ***Discharge and mass fluxes of the updated and original projects.***

| Parameter | Values | | | Comment / Assumption |
|---|---|---|---|---|
| | Updated | Original (GHD 2021) | % Reduction | |
| Discharge | 10.3 MGD | 12.5 MGD | 17.6% | Updated project specification |
| $NO_X$ | 555 kg/day | 729 kg/day | 23.9% | Assume entire project specification load of TN is $NO_X$ |
| Temperature | 68°F | 71.4°F | 5% | Updated project specification |
| Salinity | 31 PSU | 26.8 PSU | -16% (increase) | Updated project specification |

# 3. Dilution requirement

Table 2 summarises the relevant changes in the discharges, concentrations and dilution requirements between the updated (Yellowtail Kingfish) and GHD (2021) original (Atlantic Salmon) projects, which include:

- A ~9-fold increase in the Samoa WWTP discharge.
- A ~40% decrease in the DG Fairhaven power plant discharge.
- A ~13% decrease in the comingled discharge through the multi-port diffuser.
- A ~8% decrease in the Nordic aquaculture facility's NOx concentration.
- A ~10% decrease in the comingled $NO_X$ concentration through the multi-port diffuser.
- A decrease in the required dilution at the edge of the zone of potential WQ degradation from ~200 (i.e. GHD [2021] conservatively increased to a value of 200 from the estimate of 193.7) to ~180 (i.e. conservatively increased from the estimate of 173.9).
- A ~22% decrease in the $NO_X$ load from the comingled discharge into the marine environment through the multi-port diffuser.

On the basis of the lower $NO_X$ dilution requirement and $NO_X$ load of the updated project, a decrease in the GHD (2021) spatial extent of the zone of potential WQ degradation of the original project is expected.

*Table 2* ***Inputs and estimates of required dilution at the edge of the zone of potential WQ degradation of the updated and original projects.***

| Parameter | Nordic Discharge | | WWTP Effluent | | Power Plant Discharge | | Comingled Discharge | | WQO (mg/L) | Ambient (mg/L) | Dilution Requirement | | Reduction in GHD (2021) Comingled Discharge Load |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Updated | Original | Updated | Original | Updated | Original | Updated | Original | | | Updated | Original | |
| Discharge (GPM) | 7,153 | 8,681 | 525[2] | 53 | 243[3] | 400 | 7,921 | 9,134 | | | | | |
| $NO_X$ (mg N/L) | 14.24 | 15.41 | 5 | 5 | 0.15 | 0.15 | 13.19 | 14.68 | 0.225 | 0.15 | 173.9 | 193.7 | 22.1% |

[2] Increase to permitted discharge of Samoa WWTP.
[3] Decrease to DG Fairhaven permitted discharge of facility.

# 4. Diffuser

GHD (2021) recommended that 64 open ports of the existing multi-port diffuser will yield acceptable mixing performance in the near-field region. The near-field region is the localised region immediately in the vicinity of the diffuser where energetic mixing of the plume with the ambient waters occurs because of its high exit velocity from the port (jet-induced mixing) and its lower density than the surrounding waters (because of lower salinity) that causes it to rise (and mix) through the water column (buoyancy-driven mixing). After these short-term (seconds for jet-induced, minutes for buoyancy-driven) processes deplete, only natural turbulent mixing further mixes the comingled discharge waters with the ambient marine waters, albeit at a much slower rate than the near-field mixing mechanisms. This latter natural mixing regime zone is referred to as the far-field.

A reduction in the number of open diffuser ports that were recommended by GHD (2021) will be needed for the updated project to maintain a similar mixing performance as the original project. Assuming the recommended length of the active portion of the multi-port diffuser with open ports is maintained as specified by GHD (2021), then the GHD (2021) far-field simulations of the original project can be used to estimate the spatial extent of the zone of potential WQ degradation for the updated project.

Because of the increased salinity of the comingled discharge for the updated project (31 PSU) relative to the original project (26.8 PSU), a slightly higher exit velocity than the GHD (2021) recommendation may be needed to balance buoyancy-driven mixing losses to maintain near-field mixing performance. A reduction in the number of ports from 64 (original project) to 56 (updated project) will likely achieve similar near-field mixing performance. It follows that the far-field modelling can be utilised to estimate the change in the areal extent of the zone of potential WQ degradation as the near-field plume dynamics will be similar.

Additionally, the ~22% reduction in the $NO_X$ load of the comingled discharge for the updated project also needs to be accounted for (see Table 2).

# 5. Zone of potential WQ degradation

GHD (2021) predicted the zone of potential WQ degradation for the original project. The boundary of this zone was defined as 200 dilutions of plume water with ambient seawater (note that this is greater than the estimate of ~194 in Table 2 as conservative measure). For the updated project design a lower requirement of 180 dilutions at the boundary was adopted (note that this is greater than the estimate of ~174 in Table 2 as conservative measure). Additionally, a further 20% reduction in the GHD (2021) simulated concentrations of the numerical conservative tracer that is used to calculate dilution throughout the model domain was also applied to account for the estimated 22.1% reduction in the $NO_X$ load of the comingled discharge for the updated project design (see Table 2).

The GHD (2021) winter (Figure 1) and summer (Figure 2) simulations were re-analysed to define the spatial extent of the zone of potential WQ degradation accounting for the lower dilution requirement and $NO_X$ load reduction of the updated project whereby:

- A small decrease in the areal extent of the zone of potential WQ degradation is predicted solely on the basis of the lower required dilution of 180 relative to the original project's required dilution of 200.
- An even greater decrease in the areal extent of the zone of potential WQ degradation is predicted accounting for the ~20% decrease in the NOx load of the updated project.

In short, the areal extent of the predicted zone of potential WQ degradation is predicted to be smaller for the updated project design relative to the original project.

# 6. Summary and conclusions

- The discharges (but not nutrient concentrations) from the Samoa WWTP and Fairhaven DG power plant were revised in this short report to be consistent with permit conditions.
- The discharge from the updated aquaculture facility will be ~17.6% lower than the original design. Revised estimates of the discharge from the DG Fairhaven power plant and Samoa WWTP yield a ~13.2% decrease

in the comingled discharge to be released to the marine environment via the multi-port diffuser relative to the original project estimates of GHD (2021).

- This will require a reduction in the number of open ports of the existing multi-port diffuser from ~64 to ~56 to maintain a similar near-field mixing performance as the GHD (2021) original project assessment.
- $NO_X$ is the parameter that establishes the zone of potential WQ degradation. The comingled discharge to the marine environment from the updated project is projected to have a reduced $NO_X$ load (~22%) and $NO_X$ concentration (~8%) than the original project. The lower $NO_X$ concentration of the comingled discharge (i.e. combination of Nordic aquaculture facility, Samoa WWTP, DG Fairhaven power plant) of the updated project reduces the required dilution at the boundary of the zone of potential WQ degradation from ~200 (GHD 2021) to ~180.
- On the basis of the GHD (2021) simulations, a small decrease in the zone of potential WQ degradation is predicted for representative summer and winter scenarios for the reduced required dilution (~180) of the updated project. A further reduction in the areal extent of the zone of potential WQ degradation is estimated accounting for the ~20% reduction in the $NO_X$ load of the comingled discharge of the updated project.

In short, the updated project specifications (as specified in this short report) are predicted to decrease the spatial extent of the zone of potential water quality degradation relative to the original project.

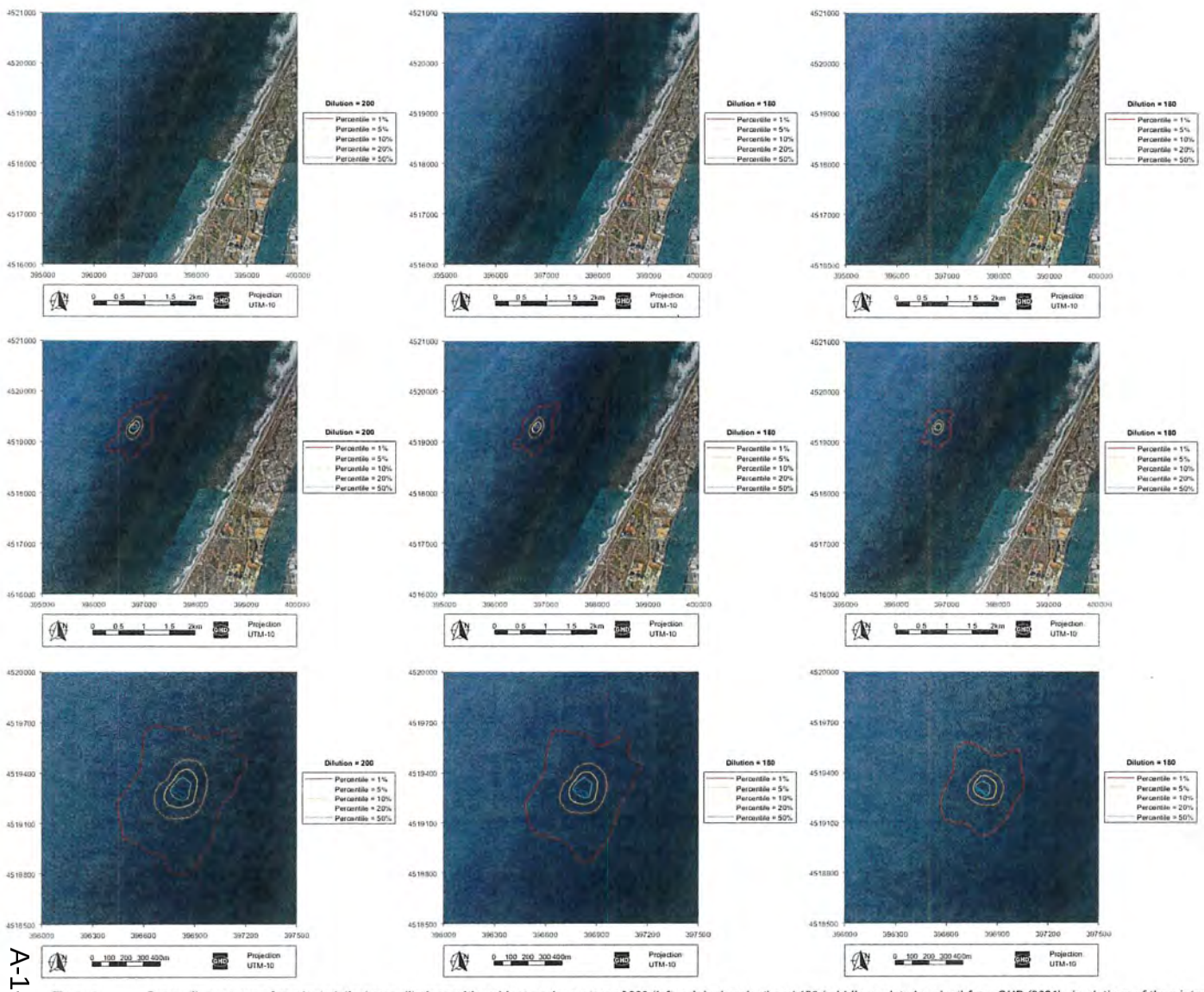


*Figure 1* *Percentile contours of comingled discharge dilutions with ambient marine waters of 200 (left, original project) and 180 (middle, updated project) from GHD (2021) simulations of the winter scenario at the surface (top, upper 2 m), mid-water (middle 2-16 m) and near-seabed (bottom, >16 m). Percentile contours from the GHD (2021) winter simulation accounting for both a dilution requirement of 180 and a 20% reduction in the $NO_x$ load illustrated in the right panels.*

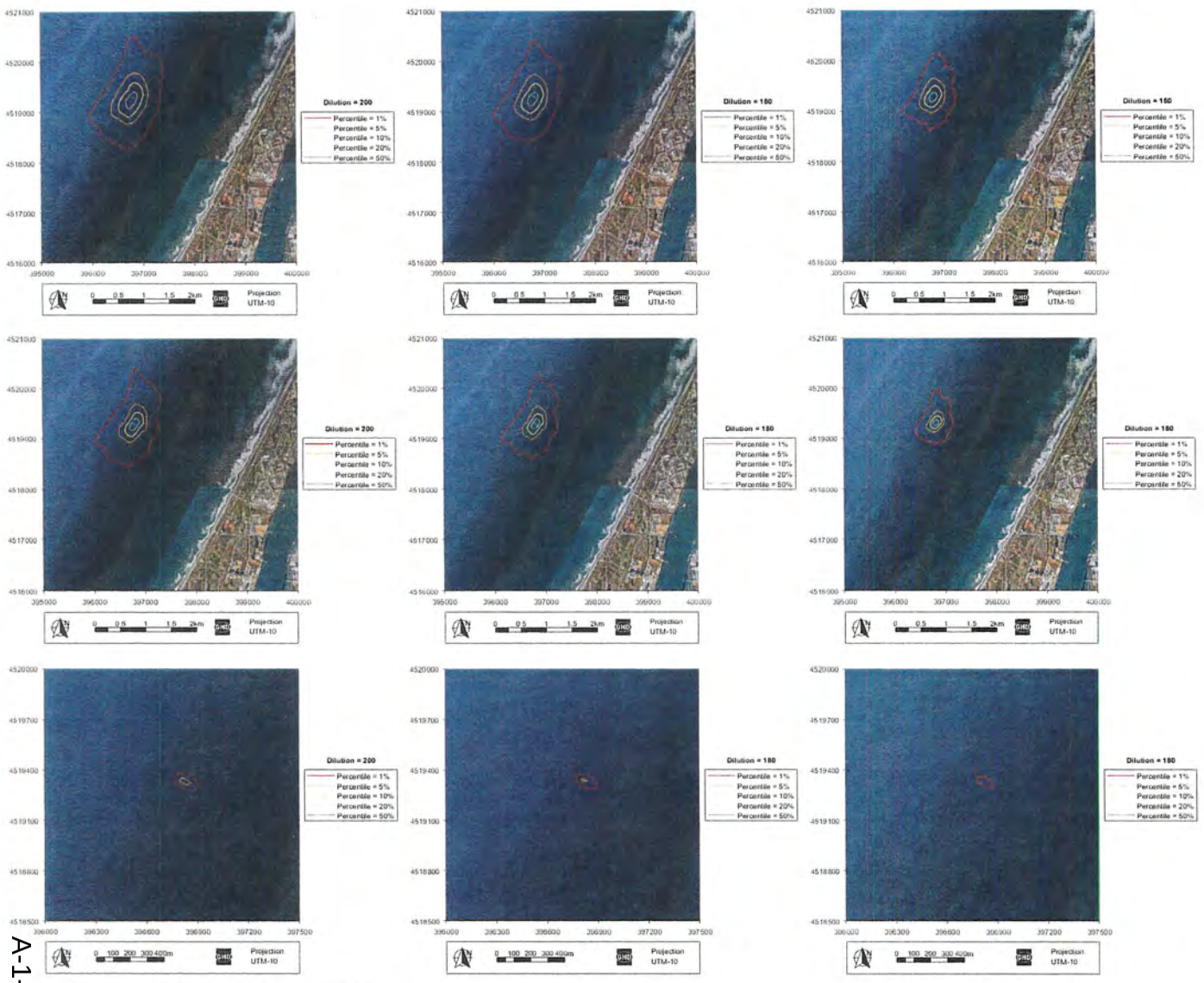


*Figure 2 As Figure 1 for the summer scenario.*

| Project name | | NORDIC AQUAFARMS CA-HUMBOLDT ENV | | | | | |
|---|---|---|---|---|---|---|---|
| Document title | | Report \| Estimates of Change to Predicted Zone of Water Quality Degradation from Updated Project Design | | | | | |
| Project number | | 11205607 | | | | | |
| File name | | 11205607-SREP-0_Nordic_Response_to_CCC_Letter_Item_3.docx | | | | | |
| Status Code | Revision | Author | Reviewer | | Approved for issue | | |
| | | | Name | Signature | Name | Signature | Date |
| S0 | 0 | J. Romero | T Sullivan | | Misha Schwarz | | 7/14/23 |

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**ATTACHMENT 3**

**Site Plan Revision**

**May 12, 2023**

PLEASE NOTE! THE BLACK LINES ILLUSTRATE THE ORIGINAL SITE LAYOUT

GRID CONNECTION

OUTFALL PIPE

BUILDING 1, Reduced footprint
Length reduced by appr. 280 ft


WWTP (ACTIVATED SLUDGE)

SEA CHEST

Preliminary Design

All dimensions are in mm
Sharp edges and burrs to be removed
Tolerance ISO 2768-m, if nothing else is stated

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Nordic Aquafarms Technology
Skjæringsvej 88, 8520 Lystrup, Denmark

| | Date | Name |
|---|---|---|
| Drawn | 07-02-2023 | MKT |
| Checked | | |
| Approved | | |

Drawing number: NAF ECU 02 - Site

Sheet: Sheet 1 of 1 | Revision: 1 | Format: A1

REVISION HISTORY

| REV | SHEET | DESCRIPTION | DATE | BY | CHKD |
|---|---|---|---|---|---|
| 1 | ALL | 50 ft reference line added by east end of building 1 | 03-05-2023 | MKT | BC |